# ABSTRACTS

### **OCTOBER RESEARCH CONFERENCE IN SILISTRA**

# THUR-110-1-KS(S)

**THUR-110-1-KS(S)-01** 

# THE CATHEDRAL CHURCHOF PATRIARCH DAMIAN /927-971/ IN DRUSTAR/SILISTRA

**Prof. Georgy Atanasov, DhS** Regional historical museum, Silistra, Head of Archeology Department Phone:+359 88 763 4118 e-mail:geoatal@abv.bg

Abstract: for a longtime, the 25.20 x 15.55 m church on the bank of the Danube was believed to be the patriarchal cathedral .During the archaeological excavations in 2016, a large cross-domed church was partially uncovered in the center of Drustar's citadel. It was built on the ruins of an earlier church from the middle of the 9th century, which was the episcopal cathedral from the middle of the 9th to the beginning of the 10th century. The new church is a three-nave triapsed cross-domed basilica of the Constantinople type with square construction / the stones were taken from the earlier basilica/ on pink mortar. All three apses are pentagonal on semicircular foundations. The sidenaves are about 3 m wide, and the central one is 7.8 m. The walls, respectively the bases of the outer walls are 1.40 m, and the central nave is wider - 1.50 m. The dome has a diameter of about 7, 8 m. There is a syntron in the central nave. In terms of plan and construction, this temple has analogues in Preslav from the 10th century /the churches in the surroundings of Avradaka, the monastery church of Mostich, etc./, aswell as with churches from the beginning of the 10th century in Constantinople – Mirelayona by Roman Lacapin /arr. 82/ and the church of Constantine Lips /arr. 81/. The parameters of the cathedral temple in Drustar /about 33x21.60/ suggest that this is so far the largest archeologically documented cross-domed temple of the Constantinople type in the Byzantine cultural circle. The cathedral was built after Bishop Damian of Drustar was recognized as Patriarch from Constantinople in 927. The church on the bank of the Danube was the palace church of the patriarch, and the patriarchal residence was revealed to the west of it.

## FRI-239-1-PPM(S)-01

# PSYCHOLOGICAL ASPECTS OF THE PROFESSIONAL-PERSONAL PURPOSE OF THE FUTURE TOUR-GUIDE IN THE TOURIST GUIDE INDUSTRY

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

**Abstract:** The psychology of the tour-guide person in tourism is one of those parts of psychological knowledge, which is at the base of the scientific organization of the tour-guiding work and the educational-psychological training of the future tour-guide. This text looks at separate psychological aspects, relating to the professional-personal purpose of the future tour-guide in the tourist guide industry, which already have a significant meaning in the specialized psychological education. Encompassing all psychological aspects of the tour-guide personality is a complex activity, which is why we aim at those problems and issues, relating to the personality of the tour-guide in tourism and in particular as a subject of the tourist guiding activity.

**Keywords:** psychology, tour-guiding, personality, tour-guide, profession, purpose, self-definition, interests, motivation, reflection, calling.

## REFERENCES

Klimov, E., 2010. Psychology of professional self-determination. Moscow: Academy (**Оригинално заглавие:** Климов, Е., 2010. Психология профессионального самоопределения. Москва: ИЦ "Академия".)

Kozhuharov, V., 2015. Orthodoxy and spirituality. Veliko Tarnovo: Vesta (*Оригинално* заглавие: Кожухаров, В., 2015. Православие и духовност. Велико Търново: изд. "Веста".)

Міпсhev, В., 1998. Problems of general psychology. Sofia: Veda Slovena" (**Оригинално** заглавие: Минчев, Б., 1998. Проблеми на общата психология. София: изд. "Веда Словена-ЖГ".)

Neshkov, M., Kr. Trendafilov, V. Kazandzhieva, 2008. Guided tours. Varna: Science and Economics (*Оригинално заглавие: Нешков, М., Кр. Трендафилов, В. Казанджиева, 2008. Екскурзоводство. Варна:* ИУ "*Наука и икономика*".)

Реtkov, A., 1987. Personality and mental adaptation. Sofia: Science and art (**Оригинално** заглавие: Петков, А., 1987. Личност и психична адаптация. София: изд. "Наука и изкуство".)

Rasheva-Merjanova, Ya., M. Bogdanova, 2012. European career education and the national perspective. Concepts, models, solutions. Sofia: ed. Avangard Prima (*Оригинално заглавие:* Рашева-Мерджанова, Я., М. Богданова, 2012. Европейско кариерно образование и националната перспектива. Концепции, модели, решения. София: изд. "Авангард Прима".)

Savova, Z., 2008. Medical psychology. Sofia: Simolini 94 (**Оригинално заглавие:** Савова, 3., 2008. Медицинска психология. София: изд. "Симолини 94".)

Volodina, Yu., 2022. Psychology of professional self-determination of adolescents and young men. Moscow: Direct-Media (*Оригинално заглавие:* Володина, Ю., 2022. Психология профессионального самоопределения подростков и юношей. Москва: изд. "Директ-Медиа".)

# TOWARDS AN ANALYTICAL OVERVIEW OF THE PEDAGOGICAL REFLECTION AS SELF-BRANDING

### Assoc. Prof. Diana Zhelezova, PhD

Department of Technical and Natural Sciences, Silistra Branch, "Angel Kanchev" University of Ruse Phone: 086-821 521 E-mail: dmindizova@uni-ruse.bg

**Abstract:** The report studies the skill for pedagogical reflection as an autonomous strategy for conscious, fieldindependent and analytical behavior of the professional pedagogical personality. The PerSSS model is described with its constituents: self-observation, self-assessment, self-upgrading, which is described as an important psychological prerequisite and condition for the overall pro-activating development of the reflective pedagogical self-consciousness.

*Keywords:* pedagogical reflection, self-observation, self-assessment, self-upgrading *JEL Codes:* L10, L11

## REFERENCES

Vasilev, V. (2006). Refleksiyata po poznanieto, samopoznanieto i praktikata. Plovdiv: Izdatelstvo: Makros (**Оригинално заглавие:** Василев, В. (2006). Рефлексията по познанието, самопознанието и практиката. Пловдив: Издателство: Макрос).

Dimitrova, G. (1996). Pedagogicheskoto obstuvane pri vuzpitatelnija process. Sofia: Izdatelstvo: Veda Slovena-ZhG (**Оригинално заглавие:** Димитрова, Г. (1996). Педагогическото общуване при възпитателния процес. София: Издателство: "ВЕДА СЛОВЕНА – ЖГ").

Dimitrova, G. (2002). Humanism, obstuvane, vuzpitanie. Sofia: Izdatelstvo: Veda Slovena-ZhG (**Оригинално заглавие:** Димитрова, Г. (2002). Хуманизъм, общуване, възпитание. София: Издателство: "ВЕДА СЛОВЕНА – ЖГ").

Dimitrova, G., M. Belova, N. Bojadjieva, Kl. Sapundjieva, (1997). Teoretichni osnovi na obrazovanieto. Sofia: Izdatelstvo: Veda Slovena-ZhG (*Оригинално заглавие:* Димитрова, Г., М. Белова, Н. Бояджиева, Кл. Сапунджиева (1997). Хуманизъм, общуване, възпитание. София: Издателство: "ВЕДА СЛОВЕНА – ЖГ").

Merdjanova, Yana. (2000). Psihopedagogicheska i profesionalna diagnostika. Izsledovatelski instrumentarium. Sofia: Izdatelstvo: Tilia. (*Оригинално заглавие: Мерджанова, Яна. (2000). Хуманизъм, общуване, възпитание. София: Издателство: "Тилиа"*).

# THE GOLDEN RATIO AND LITERATURE LESSON DESIGN

### Assoc. prof. (Lina) Galina Lecheva, PhD

Department of Technical and Natural Sciences, Silistra Branch, "Angel Kanchev" University of Ruse Phone: +359 8 540 0647 E-mail: glecheva@uni-ruse.bg

**Abstract:** The problem of increasing the QUALITY of education is related to the application of the competence approach. An educational paradigm is oriented towards the formation of personally and socially significant qualities such as self-reliance, independence, ability for self-regulation and reflection, personal responsibility and other types of transversal competences.

*This text offers an experimental model for literature lesson design organized around the golden ratio. Key words: the golden ratio, the competence approach, literature lesson design* 

## REFERENCES

Нгіstova-Peeva, N.(2008) Teaching literature as bricolage. Bulgarian Language and Literature (electronic version), 2008, No. 5; © Electronic magazine LiterNet, 18.12.2008, No. 12 (109). (Оригинално заглавие: Христова-Пеева, Н. Обучението по литература като бриколаж. Български език и литература (електронна версия), 2008, № 5; © Електронно списание LiterNet, 18.12.2008, № 12 (109).

Lecheva, G. (2005) Educational training in the "Europe of knowledge" or the magic of sowing wisdom. Ruse/Silistra. 2005. See: https://lechevag.blogspot.com/2011/03/blogpost\_461.html) (Оригинално заглавие: Лечева, Г. Възпитаващото обучение в "Европа на познанието" или магията да сееш мъдрост. Русе/Силистра. 2005. Виж: https://lechevag.blogspot.com/2011/03/blog-post\_461.html)

Lecheva, G. (2006) Address to "girls and boys who extended their palm to the wisdom of the ancients" In: Pomagalo po ancient Greek literature (epic-lyric-drama). Publication of NC "St. Daziy Dorostolsky". Silistra. 2006. (Оригинално заглавие: Лечева, Г. Обръщение към "момичета и момчета, протегнали длан към мъдростта на древните" В: Помагало по старогръцка литература (епос-лирика-драма). Издание на НЦ "Св. Дазий Доростолски". Силистра. 2006. Достъпно на: https://sites.google.com/site/linalecheva/home/samostoatelni-izdania/pomagalo-po-starogrcka-literatura-epos---lirika---drama

Lecheva, G. (2008) Synergy of the literary and educational discourse. In: "Notices", vol. 3. NC "Daziy Dorostolski". Silistra. 2008.[ (Оригинално заглавие: Лечева, Г. Синергия на литературнообразователния дискурс. В: "Известия", кн. 3. НЦ "Дазий Доростолски". Силистра. 2008.[25] Достъпно на: https://lechevag.blogspot.com/2011/03/blog-post\_461.html

Radev, R. (2015) Technologies of methods in teaching literature. Slavena. Varna. 2015.[c. 7. **Оригинално заглавие:** Радев, Р. Технологии на методите в обучението по литература. Славена. Варна. 2015.[c. 7]

Teneva, T. (2005) The lesson in literature. Methodology and methodology. "Bishop Constantine of Preslavski" UI. Noisy. 2005. (Оригинално заглавие: Тенева, Т. Урокът по литература. Методология и методика. УИ "Епископ Константин Преславски". Шумен. 2005. Достъпен на: https://liternet.bg/publish8/tteneva/interpretacia.htm

Yoveva, R. (2002) Mechanisms of power and dialogue in literary and educational discourse. In: magazine Bulgarian language and literature. 2002, vol. 2-3 (electronic edition) (Оригинално заглавие: Йовева, Р. Механизми на властта и диалогът в литературнообразователния дискурс. В: сп. Български език и литература. 2002, кн. 2-3 (електронно издание) Zhelezova-Mindizova, D. (2020) New roles of the foreign language teacher when applying the competence approach in the digital classroom. In: 26th International Scientific Conference THE TEACHER OF THE FUTURE, published in International Journal Scientific Papers Vol. 40, Budva, Montenegro, INSTITUTE OF KNOWLEDGE MANAGEMENT, 2020, pp. 393-398 pp., ISBN 2545 –4439.) (Оригинално заглавие: Железова-Миндизова, Д. Нови роли на учителя по чужд език при прилагане на компетентностния подход в дигиталната класна стая. В: 26th International Scientific Conference THE TEACHER OF THE FUTURE, published in International Journal Scientific Papers Vol. 40, Budva, Montenegro, INSTITUTE OF KNOWLEDGE MANAGEMENT, 2020, cmp. 393-398 cmp., ISBN 2545 –4439.)

# PSYCHOLOGICAL DISTINCTIVENESS OF THE PROFESSIONAL-PERSONAL SHAPING, DEVELOPMENT AND PERFECTION OF THE TOUR-GUIDE

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

**Abstract:** This text presents the psychological distinctiveness of the professional-personal shaping, development and perfection of the tour-guide. The systematized essences of the professional shaping, development and perfection of the tour-guide's personality are organically interrelated, but they do not overlap entirely. They stand out as a permanent and universal process, which continues throughout the full length of his or her professional work. their harmonious combination can be explained as complete professional development of the tour-guide's personality, which best reflects his or her main opportunities for professional realization.

**Keywords:** personality, tour-guide, stages, professional shaping, professional development, professional perfection, professional competence.

## REFERENCES

Gruchka, L., 2009. Excursion guiding activity. – In: Tour operator, agency and transport activity. Sofia: Thrace-M (*Оригинално заглавие:* Гръчка, Л., 2009. Екскурзоводска дейност. – В: Туроператорска, агентска и транспортна дейност. София: изд. "Тракия-М".)

Krasteva, V., 2011. Guided tours. Burgas: Dimant (**Оригинално заглавие:** Кръстева, В., 2011. Екскурзоводство. Бургас: изд. "Димант".)

Rasheva-Merjanova, Ya., M. Bogdanova, 2012. European career education and the national perspective. Concepts, models, solutions. Sofia: Avangard Prima (*Оригинално заглавие: Рашева-Мерджанова, Я., М. Богданова, 2012. Европейско кариерно образование и националната перспектива. Концепции, модели, решения. София: изд. "Авангард Прима".*)

Stamatov, R., 2006. Psychology of communication. Plovdiv: Hermes (*Оригинално* заглавие: Стаматов, Р., 2006. Психология на общуването. Пловдив: ИК "Хермес".)

Trifonov, Tr., 1995. Psychology of personality. Sofia: Pamet (**Оригинално заглавие:** Трифонов, Тр., 1995. Психология на личността. София: ИК "Памет".)

# DEVELOPING SKILLS FOR INDEPENDENT LEARNING THROUGH PROJECT WORK

## Senior Teacher Mirena Zaneva, teacher master

Vasil Levski High School – Dulovo sity, Tel.: +359 88 9731863 E-mail: mzanewa81@abv.bg

**Abstract:** In today's dynamic digital world, modern technologies are extremely active in school. That is why the demand for an effective formula for attractive, high-quality and effective teaching of Bulgarian language and literature continues to grow. In view of this, the article presents the method for developing skills for independent learning through project work.

The goals that are realized in the application of the model in the classes of Bulgarian language and literature at the level of the curriculum develop and increase the basic key competencies of the students.

*Keywords:* methods, visualization, native language teaching, project *JEL Codes:* 12 123

## REFERENCES

Georgieva, M., V. Jobov, D. Dimitrova, V. Gabrovska. 2017. Bulgarian language textbook for 7th grade/ Bulgarian language textbook for 7th grade. IC "Anubis" OOD, "KLET BULGARIA" OOD (**Оригинабно заглавие**: Георгиева, М., В. Жобов, Д. Димитрова, В. Габровска. 2017. Учебник по български език за 7.клас/ Учебна тетрадка по Български език за 7. клас. ИК "Анубис" ООД, "КЛЕТ БЪЛГАРИЯ" ООД)

Gerdzhikova, M., Olga Popova, Iliana Krasteva. 2017. Literature textbook for 7th grade./Literature worksheets for 7th grade. "Bulvest 2000" publishing house, "KLET BULGARIA" Ltd (*Оригинално заглавие:* Герджикова, М., Олга Попова, Илияна Кръстева. 2017. Учебник по литература за 7. клас./Работни листи по литература за 7. клас. Издателство "Булвест 2000", "КЛЕТ БЪЛГАРИЯ" ООД)

IZZI. Digital. 2018. a modern interactive educational environment for learning and selftraining.(*Оригинално заглавие: Модерна* интерактивна образователна среда за обучение и самоподготовка. Виж: *https://bg.izzi.digital*)

Lecheva, Lina Galina. 2021. Flexible Teaching Methods – the scrum metodoldgy. PROCEEDINGS OF UNIVERSITY OF RUSE - 2021, volume 60, book 11.1. Look: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://conf.uni-ruse.bg/bg/docs/cp21/11.1/11.1-5.pdf

Lecheva, G. 2010. Synergetic methods (Interactive model of permanent pedagogical practice). Silistra. RITT Publishing House. Available at: https://lechevag.blogspot.com/p/blog-page\_20.html (**Оригинално заглавие**: Лечева, Г. Синергетични методи (интерактивен модел на перманентна педагогическа практика). Силистра. Издателство RITT. Достъпен на: https://lechevag.blogspot.com/p/blog-page\_20.html

Lecheva, G. 2008. Synergy of literary education discourse. Notices of the NC "St. Daziy Dorostolsky". Silistra. 2008. p. 26-39. (*Оригинално заглавие:* Синергия на литературнообразователния дискурс. Известия на НЦ "Св. Дазий Доростолски". Силистра. 2008.cmp. 26—39.)

# EVELOPMENT OF FUNCTIONAL LITERACY OF STUDENTS BY IMPROVING THEIR SKILLS FOR READING

## Senior Teacher Stiliyana Cherkezova, teacher master Vasil Levski High School – Dulovo sity, Tel.: +359 878193704 E-mail: suvasillevskidulovo@gmail.com

**Abstract:** This report examines the concept of ' reading literacy ' as a necessary basis for the formation and enhancement of the functional literacy of students. a theoretical model of the "scenario method" is presented as a method for developing students ' reading literacy in Bulgarian language classes. There are methodological decisions for how to adequately be used the "scenario method" according to the needs of students and the level of their intellectual development.

*Keywords: literacy, functional literacy, reading literacy, reading skills, learning methods in reading. JEL Codes: 12* 123

### REFERENCES

Angelova, T. (2016). How to promote the literacy of Bulgarian students or the new old idea in education. Q: The new idea in education. Volume 2 http://research.bfu.bg (September 2, 2022). (**Оригинално заглавие:** Ангелова, Т. (2016). Как да бъде насърчавана грамотността на българските ученици или новата стара идея в образованието. В: Новата идея в образованието. Том 2 http://research.bfu.bg (02.09.2022 г.)

Dimitrova, D. (2016). Typological characteristics of reading comprehension tasks.// Bulgarian language and literature, 2016, No. 3, 223–233. (*Оригинално заглавие:* Димитрова, Д. (2016). Типологични характеристики на задачите за възприемане на текст при четене.// Български език и литература, 2016, №3, 223–233.)

Dimitrova, D. (2017). On reading literacy and its improvement. In: Intuition and competence in language, literature and education, Plovdiv: Horizont, pp. 223-238. (*Оригинално заглавие:* Димитрова, Д. (2017). За четивната грамотност и нейното подобряване. В: Интуиция и компетентност в езика, литературата и образованието, Пловдив: Хоризонт, с. 223-238)

Opinion. EU.(2022) Opinion of the Committee of the Regions on "Combating illiteracy". (*Оригинално заглавие:Становище. EC.(2022) Становище на Комитета на регионите* относно "Борба с малограмотността". Изготвяне на амбициозна европейска стратегия за предотвратяване на изключването и насърчаване на личната реализация, 2010 www.eulaw.egov.bg/DocumentsList.aspx?idstr=26780 (13. 09.2022)

Tankova, R. (2014). Didactic technologies for initial mastery of the Bulgarian language by students with a dominant mother tongue of Romany and Turkish. Plovdiv procedures.uni-plovdiv.bg (28.08.2022) (**Оригинално заглавие:** Танкова, P. (2014). Дидактически технологии за начално овладяване на българския език от ученици с доминиращ майчин ромски и турски език. Пловдив procedures.uni-plovdiv.bg (28.08.2022)

Study programs in Bulgarian language and literature grades 5-12, 2022. (*Оригинално* заглавие: Учебни програми по български език и литература 5 – 12. клас. www.mon.bg (29.08.2022)

Lecheva, Lina Galina. 2021. Flexible Teaching Methods – the scrum metodoldgy. PROCEEDINGS OF UNIVERSITY OF RUSE - 2021, volume 60, book 11.1. Look: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://conf.uni-ruse.bg/bg/docs/cp21/11.1/11.1-5.pdf

Lecheva, G. 2010. Synergetic methods (Interactive model of permanent pedagogical practice). Silistra. RITT Publishing House. Available at: https://lechevag.blogspot.com/p/blog-page\_20.html (*Оригинално заглавие*: Лечева, Г. Синергетични методи (интерактивен модел на перманентна педагогическа практика). Силистра. Издателство RITT. Достъпен на: https://lechevag.blogspot.com/p/blog-page\_20.html

Lecheva, G. 2008. Synergy of literary education discourse. Notices of the NC "St. Daziy Dorostolsky". Silistra. 2008. p. 26-39. (*Оригинално заглавие:* Синергия на литературнообразователния дискурс. Известия на НЦ "Св. Дазий Доростолски". Силистра. 2008.стр. 26—39.)

# THE FORMATION OF GEORGIAN COMPETENCE - AN IMPORTANT STRUCTURAL ELEMENT OF THE MODERN EDUCATION OF STUDENTS

#### Valentin Atanasow, teachet master

Vasil Levski High School – Dulovo Phone: +359 88 457 1583 E-mail: vvaallkkaa@abv.bg

**Abstract:** Geographical education is part of the modern educational system, in which a number of changes must be made to make it interesting and in line with new realities. In this direction, it is necessary to form the Georgian competence, which is an important structural element of modern education. The construction of a picture of the world and the socialization of the personality are also important for the modern student.

*Keywords:* Formation of Georgian competence, modern education, geography *JEL Codes:* L10, L11

#### REFERENCES

Аngelova-Gancheva, D. (2007). Obrazovatelni informacionno-komunikacionni tehnologii za razvitie na geografska kultura v srednoto uchilishte. Izd. "D-r Ivan Bogorov", S., 2007 (*Оригинално заглавие:* Ангелова-Ганчева, Д. (2007) Образователни информационно-комуникационни технологии за развитие на географска култура в средното училище. Изд. "Д-р Иван Богоров", С.)

Вопеva, G. (2009). Kompetentnosten podhod kym obrazovanieto i novata obrazovatelna paradigma. Sp. Pedagogika, s. 9–10, 12–27 (*Оригинално заглавие:* Бонева, Г. (2009), Компетентностен подход към образованието и новата образователна парадигма. Сп. Педагогика, с. 9–10, 12–27)

Vladeva, R., I. Vladev. (2003). Cennostite v obuchenieto po geografiia na bazata na uchebnoto sydyrzhanie za naselenie i selishta.//Sb. Pyrva Balkanska konferenciia: Obrazovanietoglobalna identichnost i kulturno raznoobrazie, St. Zagora, , t. 3, s. 109 – 115. (*Оригинално заглавие: Владева, P., И. Владев. (2003). Ценностите в обучението по география на базата на учебното съдържание за население и селища.//Сб. Първа Балканска конференция: Образованиетоглобална идентичност и културно разнообразие, Ст. Загора, т. 3, с. 109 – 115.)* 

Vladeva, R.(2005). Geografskoto obrazovanie i kulturata po pravata na deteto.//Obrazovanie i kvalifikaciia na pedagogicheskite kadri – razvitie i proekcii prez HHI vek, Varna, , s. 373 – 380. (*Оригинално заглавие:* Владева, Р. (2005). Географското образование и културата по правата на детето.//Образование и квалификация на педагогическите кадри – развитие и проекции през XXI век, Варна, , с. 373 – 380. )

Vlajkova, S. (1988). Formirane na umeniia v obuchenieto po geografiia. S.,. (Оригинално заглавие: Влайкова, С. (1998). Формиране на умения в обучението по география. С.)

Dermendzhieva, S., P. Sybeva, B. Dimitrova. (2010). Geografiia i obrazovanie. Metodika na obuchenieto po geografiia I chast. V. Tyrnovo, Univ. izd. "Sv. Sv. Kiril i Metodij". (*Оригинално заглавие:* Дерменджиева, С., П. Събева, Б. Димитрова.(2010). География и образование. Методика на обучението по география I част. В. Търново, Унив. изд. "Св. Св. Кирил и Методий")

Dermendzhieva, S., P. Sybeva, B. Dimitrova. (2010). Geografiia i obrazovanie. Metodika na obuchenieto po geografiia I chast. V. Tyrnovo, Univ. izd. "Sv. Sv. Kiril i Metodij",. (*Оригинално заглавие:* Дерменджиева, С., П. Събева, Б. Димитрова. (2010). География и образование. Методика на обучението по география I част. В. Търново, Унив. изд. "Св. Св. Кирил и Методий".)

Dermendzhieva, S., P. Sybeva, B. Dimitrova. (2012). Urokyt po geografiia. V. Tyrnovo, Univ. izd. "Sv. Sv. Kiril i Metodij", (*Оригинално заглавие:* Дерменджиева, С., П. Събева, Б. Димитрова. (2012). Урокът по география. В. Търново, Унив. изд. "Св. Св. Кирил и Методий")

## FRI-239-2-PPM(S)-01

# THE STEAM APPROACH IN NON-FORMAL LEARNING FOR OVERCOMING THE GENDER GAP

## Principal Assist. Prof. Diana Bebenova-Nikolova, PhD

Department of Philology and Natural Sciences, University of Ruse "Angel Kanchev", Silistra Branch Phone: 0888494077 E-mail: dbebenova@uni-ruse.bg

### Assoc. Prof. Diana Zhelezova-Mindizova, PhD

Department of Philology and Natural Sciences, University of Ruse "Angel Kanchev", Silistra Branch Phone:0898585310 E-mail: dmindizova@uni-ruse.bg

**Abstract:** STEAM is emerging both in schools and non-formal education, intending to connect young people to reality and the future by bringing new methodologies, learning environments and technologies. The paper discusses the application of STEAM in organizing girls' mobility within the VIRAGO project, funded by Erasmus+, which aims to include and motivate young females to overcome the gender gap and empower them to bring change in their communities. In the beginning, it analyses two factors that require the application of such a tool: firstly, the recommendations of the European reference framework of crucial competencies; secondly, the need to empower the participants and equip them with tools and self-confidence to act as leaders of change, Virago women. Then it discusses how the educational content was built to introduce Science, Technology, Engineering, Art and Maths topics in non-formal surroundings. Finally, it shares some positive results and provides conclusions on future applications.

*Keywords: STEAM*, *competences*, *non-formal education*, *educational content JEL Codes: 121* 

## REFERENCES

Bilbokaitė, R., & Šlekienė, V, Bilbokaitė-Skiauterienė, I. The situation of and the need for STEAM non-formal education: the context of the Lithuanian teachers' opinions, (2018). *Proceedings of EDULEARN18 Conference 2nd-4th July 2018, Palma, Mallorca, Spain, ISBN: 978-84-09-02709-5, https://library.iated.org/view/BILBOKAITE2018SIT* 

Council of Europe (2018). Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Companion Volume with New Descriptors

Nga, N.,& Ta, T. STEAM education and the applicability of design thinking as an approach to integrate Art-liberal into STEAM education,

https://www.researchgate.net/publication/356805209

Ta, T. Design thinking: procedures and techniques of teaching STEAM education, https://www.researchgate.net/publication/361332497

Zhelezova-Mindizova, D. Competence approach in foreign language teaching within education 4.0.IN: Sessons Sschedules and Abstracts, 40th Annual Science Conference of Ruse University, Ruse, University of Ruse Publishing Centre, volume 59, book 11.1., pp 123 -127, 2020, ISBN 1311-3321.

# PSYCHOLOGICAL RULES, AFFECTING THE TOUR-GUIDE'S PERSONALITY AND PROFESSIONAL GROWTH

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

**Abstract:** The process of professional shaping, development and perfection of the personality, as separate and interrelated components, are subject to certain psychological rules. This text presents some of the psychological rules, affecting the tour-guide's personality and professional growth. The tour-guide's personality development is unthinkable without knowledge of the moving powers and rules, supporting this process. The main rules in personality shaping are: upbringing, self-education, moral values orientation, work activity, tour-guiding communication, fitness and ability to work, professional skills, social perception, the urge for individual expression, etc.

**Keywords:** personality, tour-guide, profession, rules, upbringing, self-education, moral values orientation, work, communication, ability to work, fitness to work, skills, expression.

## REFERENCES

Епеva, G., 1994. Psychology. Blagoevgrad: Neofit Rilski (*Оригинално заглавие:* Енева, Г., 1994. Психология. Благоевград: УИ "Неофит Рилски".)

Ivanov, St., 2018. Psychology of professional-pedagogical communication. Sofia: St. Kliment Ohridski (**Оригинално заглавие:** Иванов, Ст., 2018. Психология на професионалнопедагогическото общуване. София: УИ "Св. Климент Охридски".)

Levitov, N., 1969. Psychology of work. Sofia: Narodna prosveta (*Оригинално заглавие:* Левитов, Н., 1969. Психология на труда. София: изд. "Народна просвета".)

Rasheva-Merjanova, Ya., M. Bogdanova, 2012. European career education and the national perspective. Concepts, models, solutions. Sofia: Avangard Prima (*Оригинално заглавие: Рашева-Мерджанова, Я., М. Богданова, 2012. Европейско кариерно образование и националната перспектива. Концепции, модели, решения. София: изд. "Авангард Прима".*)

Stamatov, R., 2006. Psychology of communication. Plovdiv: Hermes (*Оригинално* заглавие: Стаматов, Р., 2006. Психология на общуването. Пловдив: ИК "Хермес".)

# LITERARY PHENOMENA AND LITERARY EDUCATION IN THE CONTEXT OF DIGITAL CREATIVITY

## Assoc. prof. (Lina) Galina Lecheva, PhD

Department of Technical and Natural Sciences, Silistra Branch, "Angel Kanchev", University of Ruse Phone: +359 8 540 0647 E-mail: glecheva@uni-ruse.bg

**Abstract:** E-learning, which differs significantly from traditional classroom education, has become a widely acceptable and commonly used means for education nowadays (in any types of educational organizations). This paper will focus on e-literature as it is used in and for the e-learning process; e-literature is not exclusively used in e- learning process as it is also used to complement traditional literature (e.g., hard copy book) in the traditional education process. a great proportion of literature on e-literature mainly deals with issues about its preparation, content, and dissemination. However, an often-neglected view is the readiness of e-learning participants to use e-literature. As such, the current paper seeks to provide an insight into the issues related to participants' readiness to use e-literature in e-learning process. to this end, the main objective of this paper is to specify and provide and insight into participant's readiness to use e-literature in e-learning process.

Keywords: E-Learning, IT technologies, literature, Education JEL Codes: 12 123

## REFERENCES

(Lina) Galina Lecheva (2020) Digital transformation of education in the quarantine conditions. KNOWLEDGE – International Journal. Vol. 39.1. April 2020. (*Оригинално заглавие:* Лечева, (Лина) Галина. Цифровая трансформация образовании в карантинных условиях. KNOWLEDGE – International Journal. Vol. 39.1. April 2020).

(Lina) Galina Lecheva (2020) The journey in the literal – tour of Bulgarian education. KNOWLEDGE – International Journal. Vol.40.2. June 2020. (*Оригинално заглавие:* Пътуването в litera – турата на българското образование. KNOWLEDGE – International Journal. Vol.40.2. June 2020).

Damyanova, A. Hermeneutics, deconstruction, constructivism in literature education in high school. Sofia: IM "St. Cl. Ohrid ") (2012). (*Оригинално заглавие*: Дамянова, А. Херменевтика, деконструкция, конструктивизъм в образованието по литература в средното училище. София: УИ "Св. Кл. Охридски")

Gospodinov, B, R. Peicheva-Forsyth. (2018). Problems of pedagogical education of teachers. (Оригинално заглавие: Господинов, Б. Р. Пейчева-Форсайт. Проблеми на педагогическото образование на учителите. Списание на Софийския университет за образователни изследвания, 2018/1).

Grudeva, E.V. Discourse and communication. Monograph, Novosibirsk). (2015). (Оригинално заглавие: Грудева, Е.В. Дискурс и коммуникация. Монография, Новосибирск).

Radev, R. (1997). Lesson theory and technology. Plovdiv. (*Оригинално заглавие: Радев, Пл. Теория и технология на урока. Пловдив.*)

Radev, R. (2015). Technology of methods in teaching literature. Varna. Slavena. (Оригинално заглавие: Радев, Р. Технология на методите в обучението по литература. Варна. Славена.)

Rasheva-Merdjanova, II. Ognyanova. (2020). Professional pedagogy - in historical traditions and global perspectives. (Оригинално заглавие: Рашева-Мерджанова, Ил. Огнянова. Професионална педагогика – в исторически традиции и глобални перспективи. УИ "Св.св. Кирил и Методий")

Тепеva, Т. (2005). The Literature Lesson. UI "Bishop Konstantin Preslavski". Shumen (Оригинално заглавие: Тенева, Т. Урокът по литература. УИ "Епископ Констанстин Преславски". Шумен).

Todorina, D. (2010) Creating an interactive educational environment (theoretical and applied aspects). "Interactive methods in modern education", IM "N. Rilski". Blagoevgrad (Оригинално заглавие: Тодорина, Д. Създаване на интерактивна образователна среда (теоретични и приложни аспекти). "Интерактивните методи в съвременното образование", УИ "Н.Рилски". Благоевград.)

Verbitsky, A.A. Competence approach and theory of contextual learning. Moscow. (2004). (Оригинално заглавие: Вербицкий, А. А. Компетентностный подход и теория контекстного обучения. Москва).

# MODERN APPROACHES AND MODELS OF IMPROVING THE EDUCATIONAL PROCESS IN ECONOMIC ACCOUNTING ANALYSIS IN A UNIVERSITY

## Assoc. Prof. Marko Timchev, PhD

University of National and World Economy, Sofia Phone: 02 8195 340 E-mail: mtimchev@unwe.bg

**Abstract:** The report offers approaches, models and methods for improving the scientific-teaching work and the educational process in business accounting analysis of the enterprise in higher education institutions. The need to improve the educational content and teaching methods is brought out. Possibilities for using a distance form of education, active and interactive methods in conditions of digital transformation and digitization of the educational process are explored.

**Keywords:** business accounting analysis, training, interactive methods, digitalization, business games, digitalization

# THE FORMATION OF GEORGIAN COMPETENCE - AN IMPORTANT STRUCTURAL ELEMENT OF THE MODERN EDUCATION OF STUDENTS

#### Valentin Atanasow, teachet master

Vasil Levski High School – Dulovo Phone: +359 88 457 1583 E-mail: vvaallkkaa@abv.bg

**Abstract:** Geographical education is part of the modern educational system, in which a number of changes must be made to make it interesting and in line with new realities. In this direction, it is necessary to form the Georgian competence, which is an important structural element of modern education. The construction of a picture of the world and the socialization of the personality are also important for the modern student.

*Keywords:* Formation of Georgian competence, modern education, geography *JEL Codes:* L10, L11

### REFERENCES

Аngelova-Gancheva, D. (2007). Obrazovatelni informacionno-komunikacionni tehnologii za razvitie na geografska kultura v srednoto uchilishte. Izd. "D-r Ivan Bogorov", S., 2007 (**Оригинално заглавие:** Ангелова-Ганчева, Д. (2007) Образователни информационно-комуникационни технологии за развитие на географска култура в средното училище. Изд. "Д-р Иван Богоров", С.)

Вопеva, G. (2009). Kompetentnosten podhod kym obrazovanieto i novata obrazovatelna paradigma. Sp. Pedagogika, s. 9–10, 12–27 (*Оригинално заглавие:* Бонева, Г. (2009), Компетентностен подход към образованието и новата образователна парадигма. Сп. Педагогика, , с. 9–10, 12–27)

Vladeva, R., I. Vladev. (2003). Cennostite v obuchenieto po geografiia na bazata na uchebnoto sydyrzhanie za naselenie i selishta.//Sb. Pyrva Balkanska konferenciia: Obrazovanietoglobalna identichnost i kulturno raznoobrazie, St. Zagora, , t. 3, s. 109 – 115. (*Оригинално заглавие:* Владева, Р., И. Владев. (2003). Ценностите в обучението по география на базата на учебното съдържание за население и селища.//Сб. Първа Балканска конференция: Образованиетоглобална идентичност и културно разнообразие, Ст. Загора, т. 3, с. 109 – 115.)

Vladeva, R.(2005). Geografskoto obrazovanie i kulturata po pravata na deteto.//Obrazovanie i kvalifikaciia na pedagogicheskite kadri – razvitie i proekcii prez HHI vek, Varna, , s. 373 – 380. (Оригинално заглавие: Владева, Р. (2005). Географското образование и културата по правата на детето.//Образование и квалификация на педагогическите кадри – развитие и проекции през XXI век, Варна, , с. 373 – 380. )

Vlajkova, S. (1988). Formirane na umeniia v obuchenieto po geografiia. S.,. (Оригинално заглавие: Влайкова, С. (1998). Формиране на умения в обучението по география. С.)

Dermendzhieva, S., P. Sybeva, B. Dimitrova. (2010). Geografiia i obrazovanie. Metodika na obuchenieto po geografiia I chast. V. Tyrnovo, Univ. izd. "Sv. Sv. Kiril i Metodij". (*Оригинално заглавие:* Дерменджиева, С., П. Събева, Б. Димитрова.(2010). География и образование. Методика на обучението по география I част. В. Търново, Унив. изд. "Св. Св. Кирил и Методий")

Dermendzhieva, S., P. Sybeva, B. Dimitrova. (2010). Geografiia i obrazovanie. Metodika na obuchenieto po geografiia I chast. V. Tyrnovo, Univ. izd. "Sv. Sv. Kiril i Metodij", (*Оригинално* 

заглавие: Дерменджиева, С., П. Събева, Б. Димитрова. (2010). География и образование. Методика на обучението по география I част. В. Търново, Унив. изд. "Св. Св. Кирил и Методий".)

Dermendzhieva, S., P. Sybeva, B. Dimitrova. (2012). Urokyt po geografiia. V. Tyrnovo, Univ. izd. "Sv. Sv. Kiril i Metodij", (*Оригинално заглавие:* Дерменджиева, С., П. Събева, Б. Димитрова. (2012). Урокът по география. В. Търново, Унив. изд. "Св. Св. Кирил и Методий")

# STUDIES ON ARTISTIC STYLE IN BULGARIAN METHODICAL LITERATURE

**Tanya Encheva** Vasil Levski High School – Dulovo phone: +359 899 816 775 E-mail: tanyaencheva@mail.bg

**Abstract:** Artistic style occupies a special place among the styles of literary language. It is among the most important sources for enriching the literary language, it also serves as the main means of preserving vocabulary. The introduction of new words and meanings, as well as the preservation of long-established names and linguistic forms, is due to the use of fiction. Through literary texts, students have the opportunity to develop their ideas about both the real world and new fictional worlds. The report traces some of the studies on artistic style in the Bulgarian methodological literature.

*Keywords:* art style, literature, style, teaching *JEL Codes:* L29

### REFERENCES

Angelov, B. 1907. Stilistika. Uchebnik za IV klas na myzhkite i devicheski gimnazii. Systavil syglasno programata B. Angelov, uchitel ot II-ta D. M. Gimnaziia v Sofiia. Plovdiv, Izdanie i pechat na Hr. G. Danov. (*Оригинално заглавие:* Ангелов, Б. (1907). Стилистика. Учебник за IV клас на мъжките и девически гимназии. Съставил съгласно програмата Б. Ангелов, учител от II-та Д. М. Гимназия в София. Пловдив, Издание и печат на Хр. Г. Данов).

Boiadzhiev, T., Kucarov, Iv., Penchev, J., (1999). Syvremenen bylgarski ezik, Stilistichno razsloenie na leksikata, Sofiia. (*Оригинално заглавие:* Бояджиев, Т., Куцаров, Ив., Пенчев, Й. (1999), Съвременен български език, Стилистично разслоение на лексиката, София).

Georgiev, S., R. Rusinov. (1983). Hudozhestven stil. Uchebnik po leksikologiia na bylgarskiia ezik, Sofiia. (*Оригинално заглавие:* Георгиев, С., Р. Русинов. (1983). Художествен стил. Учебник по лексикология на българския език, София).

Dobrev, D., T. Teneva. (1994). Literaturno obrazovanie i interpretaciia na hudozhestven tekst v uchilishte. Izd. Glauks, Shumen. (**Оригинално заглавие:** Добрев, Д., Т. Тенева. (1994), Литературно образование и интерпретация на художествен текст в училище. Изд. Глаукс, Шумен).

Pashov, P., VI. Georgiev, Iv. Dobrev (1981). Bylgarskiiat ezik – ezik na 13-vekovna dyrzhava, Izd. Narodna prosveta, Sofiia. (*Оригинално заглавие:* Пашов, П., Вл. Георгиев, Ив. Добрев. (1981). Българският език – език на 13-вековна държава", Изд. Народна просвета, София).

Rusev, R. i dr. (2007). V ogledalniia sviat na ezika i kulturata". Ruse, (v syavtorstvo). (**Оригинално заглавие:** Русев, Р. и др. (2007). В огледалния свят на езика и културата". Русе, (в съавторство)).

Rusev, R. (2013). Uchebnikyt po stilistika na Bozhan Angelov, NAUChNI TRUDOVE NA RUSENSKIIa UNIVERSITET, tom 52, seriia 6.3. (*Оригинално заглавие: Русев, P. (2013),* Учебникът по стилистика на Божан Ангелов, НАУЧНИ ТРУДОВЕ НА РУСЕНСКИЯ УНИВЕРСИТЕТ, том 52, серия 6.3)

## FRI-110-1-PP(S)-01

# THE BULGARIAN EUROPEAN - CULTURAL MEMORY AND SYMBOLIC MESSAGES OF UNDERSTANDING AND KNOWLEDGE

## Assist. Prof. Mila Galabova-Marinova PhD

St. Cyril and St. Methodius University of Veliko Tarnovo - Branch Vratsa Phone: 0876-826667 E-mail: m.galabova-marinova@ts.uni-vt.bg

**Abstract:** In the new realities of the 21st century are emerging complex transformations in the modern humanitarian and holistic construction of the human personality. The contemporary socio-cultural competencies are built on the lasting stable basis of the Bulgarian national self-consciousness and European civilization affiliation. The psychological and pedagogical process of education, training and development follows symbolic messages of understanding and knowledge, inherent in the Bulgarian European. Verbal information especially is encoded and presented through a system of images that are clearly and permanently fixed in linguistic semantics. for example, the invariable lexical core of words, phrases, and speech constructions, stored in the universal linguistic picture of the world. from the literature derives also the Eurocivilizational concept of meaning, significance, knowledge, cultural heritage, humanitarian values, upbuilding, progress, message for the future.

**Keywords:** Bulgarian identity, European civilizational affiliation, modern sociocultural realities, cultural attitudes, communication skills, mental and receptive benchmarks, transfer of knowledge

### REFERENCES

Aretov, N., 2006. National mythology and national literature. Sofia: "Queen Mab" (*Apemos, H., 2006. Национална митология и национална литература. София: "Кралица Маб"*)

Beauty in the culture of Bulgarians and Serbs, 2017. (Красотата в културата на българи и сърби. 2017. Авт. кол. В. Търново: УИ "Св.св. Кирил и Методий")

Вепbasat, A., 2006. The "European" Bai Gagno and the bright myth of the Lucky Man. Sofia: LiK (Бенбасат, А., 2006. "Европеецът" Бай Ганьо и светлият мит за Щастливеца. София: ЛиК)

Danchev, N., 2002. Psychology of the Bulgarian. Gabrovo: UI "V. Aprilov", р. 53 (Данчев, Н. 2002. Психология на българина. Габрово: УИ "В. Априлов", 2002, с.53)

Genov, Yu., 2004. Why do we succeed so little. Think about how much some people get in our way some retrograde ideas of our culture. Sofia: "Abagar" (Генов, Ю., 2004. Защо толкова малко успяваме. Размисли върху това колко много ни пречат някои назадничави идеи на нашата култура. София: Абагар)

Georgieva, S., 2016. Comprehension as a pedagogical problem. Ruse: UI "A. Kanchev" (Георгиева, С., 2016. Разбирането като педагогически проблем. Русе: УИ "А. Кънчев")

Кігоv, D., 2014. Spiritual and national identity. Sofia: UI "St. Cl. Ohridski" (Киров, Д. 2014. Духовна и национална идентичност. София: УИ "Св. Кл. Охридски")

Khadzhikosev, R., 2015. The traveling Bulgarian. Blagoevgrad: UI "N. Rilski" (Хаджикосев, *P. 2015. Пътуващият българин. Благоевград: УИ "Н. Рилски"*)

Mihailova, N., 2021. The place of the book in children's lives. Survey research in preschool and primary school age, Education and Technology, №12, р. 288 (*Михайлова, Н., 2021. Мястото* на книгата в живота на децата. Анкетно проучване в предучилищна и начална училищна възраст, Образование и технологии, бр.12, с.288)

Ріреva, M., 2014. One's own in the other's, the other's in one's own. Bulgarian translations of English children's literature. Sofia: "St. Cl. Ohridski" (Пипева, М., 2014. Своето в чуждото, чуждото в своето. Българските преводи на английската детска литература. София: УИ "Св. Кл. Охридски")

# THE COSTUMES OF THE GREBENTSI IN SILISTRA REGION ACCORDING TO PHOTOS, PUBLICATIONS AND NOTES FROM 1785-1923

#### Snezhanka Gencheva

Independent Researcher Silistra, Bulgaria E-mail: sngencheva@yahoo.com

Abstract: The paper shows the clothing of the old local population in the Silistra region according to publications—photos and descriptions, as well as field notes, from the period 1785-1923.

**Keywords:** grebentsi, old local population, traditional clothing, crown, comb, Silistra, Almaliy, Galitsa, Garlitsa, Kalipetrovo, Aydemir, Vetren, Srebarna, Popina, Garvan, Malak Preslavets.

#### REFERENCES

Arnaudov, M. (1923) Northern Dobrudzha.—In: *The Collection*, vol. 35, Sofia, 1923 (**Оригинално заглавие:** "Арнаудов, М. Съверна Добруджа. Етнографски наблюдения и народни пъсни. – в: Сборникъ за народни умотворения и народописъ, кн. 35, С., 1923")

Blaskov R. I. (1979) Curriculum Vitae of R. I. Blaskov.—in: Ivanov, A., R. I. Blaskov, Y. Nenov. The Curriculum Vitae. Sofia, 1979. (**Оригинално заглавие:** "Автобиография на Райча Илиев Блъсков. Животоописанието ми, което захванах да пиша в Болград, Бесарабско, на 1868 г. – в: Иванов, Ат., Р. Ил. Блъсков, Ю. Ненов. Автобиографии. Съст., предг. и бележки – Н. Жечев. С., 1979")

Blaskov, I. R. (1875) Grebentsi. – in: a Garden, vol. 3, Viena, 1875. (Оригинално заглавие: "Блъсков, Ил. Р. Гребенци. - В: Градинка. Кн. 3. Градинаръ Илиія Р. Бльсковъ. Віена, 1875")

Соте d'Hoterive (1906) a Voyage from Constantinople to Yassy.—in: Perhiodical Revue, vol. 66, Sofia, 1906 (**Оригинално заглавие:** "Конт D'Hoterive. Едно пѫтуване отъ Цариградъ до Яшъ въ Молдова пръз зимата на 1785 година. Съобщава Г. Занетов. – в: Периодическо списание на Българското книжовно дружество въ София, год. 17, кн. 66, С., 1906")

Gavazov, M. (2004) The Alfatar's Bulgarians from Olshanka—past, customs, present. Silistra, 2004. (*Оригинално заглавие:* "Гавазов, Михаил. Алфатарските българи в Олшанка – минало, бит, съвремие (230 години от тяхното изселване). Силистра, 2004 ")

Lobachevskiy, V. (1888, 1891) The History of Village Olshanka John the Merciful Church (Scripture started in 1875)—In: *The Appendix to the Reports from Diocese of Kherson*, 13/1888, 23/1888, 10/1891. (*Оригинално заглавие:* "Лобачевскій, Владиміръ. Лътопись прихода с. Ольшанки св. Јоанна Милостиваго церкви (Писаніемъ начата в 1875-мъ году) – в: Прибавленія къ Херсонскимъ епархіальнымъ въдомостямъ, г. XXIX/№13 и 14, 1 и 15 июля 1888; г. XXIX/№23, 1 декабря 1888; г. XXXII/№10, 15 мая 1891")

Miletich, L. (1902) The Old Bulgarian Population in Northeastern Bulgaria. Sofia, 1902. (**Оригинално заглавие:** "Милетичъ, Л. Старото българско население в Североизточна България. С., 1902")

# TO THE QUESTION OF THREE BULGARIAN ETHNIC NAMES: RUP, SHOP, AND HURTSOI BULGARIANS

## Assoc. Prof. Ivan G. Iliev PhD

Plovdiv University, Kardzhali Campus Tel.: 0886787696 E-mail: ivan\_iliev20002000@yahoo.com

Larry Koroloff Independent researcher Toronto, Canada E-mail: dreno@sympatico.ca

Abstract: This article deals with the names of three local Bulgarian groups: ruptsi, shopi, and hartsoi. New suggestions regarding the origin of the names are made.

*Key words*: *Bulgarians, ruptsi, shopi, hartsoi. JEL Codes: L29* 

## REFERENCES

Georgiev, Vl. 1964. The Vocal System in the Process of Development of Slavic Languages. Sofia: BAS Press (*Оригинално заглавие*: *Георгиев, Вл. Вокалната система в развоя на славянските езици. София: Издателство на БАН. 1964.*)

Georgiev, G. 2022a. Rup Bulgarians. In: Bulgarian Ethnography. Ethnographic Groups (https://balgarskaetnografia.com/grupi-i-obshtosti/etnografski-grupi/ruptsi.html) (Оригинално заглавие: Георгиев, Г. Рупци. В: Българска етнография. Етнографски групи (https://balgarskaetnografia.com/grupi-i-obshtosti/etnografski-grupi/ruptsi.html).

Georgiev, G. 2022b. Hartsoi Bulgarians. In: Bulgarian Ethnography. Ethnographic Groups (https://balgarskaetnografia.com/grupi-i-obshtosti/etnografski-grupi/hartsoi.html) (**Оригинално** заглавие: Георгиев, Г. Хърцои. В: Българска етнография. Етнографски групи (https://balgarskaetnografia.com/grupi-i-obshtosti/etnografski-grupi/hartsoi.html).

Keremidchieva, Sl. 1993. The Ropka Dialect. Sofia: Мікгоргіпt (*Оригинално заглавие*: *Керемидчиева, Сл. Говорът на Ропката. София: Микропринт.*)

Stoykov, St. 1993. Bulgarian Dialectology. Sofia: BAS Press (Оригинално заглавие: Стойков, Ст. Българска диалектология. София: Издателство на БАН.)

Stoianov, V. 2014. The Hurs' Hartsoi Bulgarians. Problems of Etymologization and Mythologization in Humanitarian Studies. In: Medieval Men and their World. Miscellany in Honour of prof. Kazimir Popkonstantinov. Veliko Turnovo: Faber, 197-209. (*Оригинално заглавие*: Стоянов, В. Хърцоите на Хърс. Проблеми на етимологизацията и митологизацията в хуманитаристиката. В: Средновековният човек и неговият свят. Сборник в чест на 70-та годишнина на проф. д. и. н. Казимир Попконстантинов. Велико Търново: Фабер, 197-209.)

Ніпоч, Iv. 2002. Grains from the Treasure of my Samovodene. (*Оригинално заглавие*: *Хинов, Ив. Зрънца от богатството на моето Самоводене. Велико Търново: Фабер.*)

Hristov, P. 2022. Shop Bulgarians. In: Bulgarian Ethnography. Ethnographic Groups (**Оригинално заглавие**: Христов, П. Шопи. В: Българска етнография. Етнографски групи (https://balgarskaetnografia.com/grupi-i-obshtosti/etnografski-grupi/shopi.html).

# THE ANCIENT LANGUAGE FEATURES IN A FOLK SONG FROM SILISTRA REGION

### Assoc. Prof. Todorka Georgieva, DcS

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

**Abstract**: The paper examines the ancient peculiarities in the language of one of the Bulgarian folk songs, collected by the folk singer Yordan Nikolov - The Blind, and published in 1898. The focus is on "Song nr. 12", in which mythological and biblical images and motifs are interwoven, seen both through the Bulgarian folklore tradition and the Christian beliefs in the power of miracles.

*Key words:* ancient language, consonants, grammatical case, adjectives *JEL Codes:* L29

### REFERENCES

Gramatika, 1983. Grammar of the modern Bulgarian language (author's collective). Volume II. Morphology. Sofia: Publishing House of the Bulgarian Academy of Sciences (*Оригинално заглавие*: Граматика на съвременния български език (авт. колектив). Том II. Морфология. София: Издателство на БАН).

Nikolov, U., 1898. a Collection of Old Folk Songs, Sung in Silistra Region. Collected and Published by Yordan Nikolov, the Blind. Silistra: Printing house P. Armyanov (*Оригинално заглавие*: Сборникъ отъ стари народни пъсни, пъяни въ селата на Силистренско. Събралъ и издава Юрданъ Николов Слъпия. Силистра, Печатница П. Армянов).

Kosidovsky, 1980. Kosidovsky Z. Bible stories. Sofia: Science and Art (*Оригинално* заглавие: Косидовски З. Библейски сказания. София: Наука и изкуство).

Lives, 1974. Lives of the Saints. Sofia: Synodal publishing house (*Оригинално заглавие*: Жития на светиите. София. Синодално издателство).

Mirchev, 1978. Historical grammar of the Bulgarian language. Sofia: Science and Art (**Оригинално заглавие**: Мирчев К. Историческа граматика на българския език. София: Наука и изкуство)

Tihova, 2020. The pronoun system in the Tarnovo edition of the Silent Prologue. Shumen: University Publishing House Bishop Konstantin Preslavski (**Оригинално заглавие**: Тихова А. Местоименната система в търновската редакция на Стишния пролог. Шумен: Университетско издателство Епископ Константин Преславски)

Sreznevskiy 1892. Materials for the dictionary of the Old Russian language on written monuments. Vol. I. a – K. Sankt Peterburg: Printing house of the Imperial Academy of Sciences (**Оригинално заглавие**: Срезневский И. И. Материалы для словаря древнерусскаго языка по писменным памятникам. Т. I. A - K. Санкт Петербург: Типография Императорской академии наук).

# COLONEL NIKOLA BOTEV – COMMANDER AND GODFATHER OF THE 31ST INFANTRY SILISTRA REGIMENT IN WORLD WAR II

Natalia Mincheva, PhD Regional museum of history – Silistra Phone: 086/820 388 E-mail: natali@gbg.bg

Abstract: The research is dedicated to colonel Nikola Botev – commander of the 31st Infantry Regiment in the final stage of Bulgaria's participation in The Second World War (1944-1945). The goal is to present his military merits as commander of the regiment, as well as little-known facts from his biography that shed light on his personal qualities. **Keywords:** World War II, 31 infantry Silistra regiment, Colonel Nikola Botev

## REFERENSES

Botev, N. (1957). Silstrens in the Father's War. (**Оригинално заглавие:** Ботев, H. Силистренци в Отечествената война 1944-1945 г. С., ДВИ, 1957).

Krivorov, I. (2016). Bulgarian Army in World War II. (**Оригинално заглавие:** Криворов, И. Българската армия във Втората световна война. – В: Великите сили, Балканите и България през Втората световна война. С., ИИИ – БАН, ВА "Г.С.Раковски", 2016).

Orloeva, K. (1988). Iron Regiment. (**Оригинално заглавие:** Орлоева, К. Железният полк. С., ВИ, 1988).

Stefanov, S. (2013). a narrative about the winner. General Vladimir Stoychev. (**Оригинално заглавие:** Стефанов, С. Повест за победителя. Генерал Владимир Стойчев. С, ВИ, 2013).

Tashev. T. (2008). Bulgarian Army 1941–1945. (Оригинално заглавие: Ташев, Т. Българската войска 1941–1945. Енциклопедичен справочник. С., ВИ, 2008).

# **BALKAN RHETORIC**

### Costea Alina, Assistant professor PhD

Faculty of Letters, Department of Modern languages for Specific Purposes, Ovidius University of Constanța

**Abstract:** by tradition, rhetoric represents the art of combining parts of speech supported by theory. Unfortunately, the separate study of rhetoric as a subject taught in schools, sized to exist at the end of the XIXth century, yet it is still crucial for many domains like public debates, politics, teaching, and not in the least, for literature surviving texts that enable us to perceive reality form a historical standpoint because they need to be persuasive.

The main aim for our research is to analyze the features of the rhetoric in the Balkan Peninsula as employed by Vasile Voiculescu, a Romanian writer from the beginning of the XX th century. The purpose of doing so, sustains the idea that, through literature, one can have access to a certain type of mentality, a particular way of seeing life, such as those practiced in the Balkans for ages. Therefore, by reading Voiculescu's writings, people interested in cultural differences, in habits and customs, in identity issues and traditional communities, overall, can definitely have a great insight into all of the above. So, our paper could be regarded as a journey through centuries, a way of shaping and reshaping ideas, rituals, celebrating cycles of life, a spectacular journey made possible with the help of literature because Voiculescu, as many other Balkan writers, plays the role of a spokesperson for his nation.

Keywords- rhetoric, Balkan, mentality, identity, features.

### REFERENCES

Aristotle, Rhetoric, provided by The Internet Classiscs archive, translated by W. Rhys Roberts, URL: http://classics.mit.edu/Aristotle/rhetoric.mb.txt

Cope, E. M., An Introduction to Aristotlests Rhetoric, Palala Press, 2015

Voiculescu, Vasile, Integrala prozei literare, Editura Anastasia, Bucurști, 1998

Ducrot, Oswald; Schaeffer, Jean-Marie, Noul dicționar enciclopedic al științelor limbajului, Editura Babel, București, 1996

Muthu, Mircea, Literatura română și spiritul sud-est european, Editura Minerva, București, 1976

Plato, The Republic, translated by Benjamin Jowett, URL:

https://files.romanroadsstatic.com/materials/plato\_republic.pdf

# FRAZEOLOGISME BALCANICE AVÂND LA BAZĂ PĂRȚI ALE CORPULUI. UNITĂȚI FRAZEOLOGICE FORMATE DE LA SUBSTANTIVUL "CAP".

## Cristina-Valentina Dafinoiu,

"Ovidius" University of Constanta, Romania, E-mail: cristinadafinoiu@yahoo.com

**Abstract:** Phraseology, as a branch of linguistics that deals with the study of word combinations, represents a relatively young field of research that has not yet defined its status very clearly within linguistics; however, it is certainly a vast field, both in terms of existing phraseological units at the level of each individual language, and when we consider the comparison between two or more languages, genealogically or typologically related, as is the case with the Balkan languages.

In the present article, we aimed to analyze from a synchronic perspective the phraseological units found in the four Balkan languages, Albanian, Bulgarian, Greek and Romanian, which have the term head as their center, as well as the productivity of these phraseological units in the mentioned languages. We will also try to decode, from a grammatical point of view, the formation mechanism of these structures.

## REFERENCES

Brâncuş G. (2002), Introducere în istoria limbii române I, București, Editura Fundației România de Mâine.

Constantinescu- Dobridor Ghe. (1998), *Dicționar de termeni lingvistici,* București, Editura Teora.

Munteanu 2013 – Cristinel Munteanu, *Frazeologie românească. Formare și funcționare,* Iași, Institutul European.

Daniela Stoyanova D. (2002), Dicționar bulgar-român, Sofia, Naouka i izkoustvo.

Topciu R., Melonashi A., Topciu L. (2003), Dicționar albanez-român, Iași, Editura Polirom.

Thomai J., Lioshi Xh., Hristova R., Qiriazati K., Melonashi A., *Fjalor Frazeologjik Ballkanik*, Tirana, Editura DITURIA.

Hristea Th. (1987), "Din problemele etimologiei frazeologice românești", în *Limba română* (XXXVI), nr.2, pp. 123-135.

Saramandu N. (1987), "Concordanțe etimologice și lexicale româno- albaneze, în SCL, XXXVIII, nr. 2, pp. 126-141.

Saramandu N. (2010), Concordanțe lingvistice româno- albaneze, în vol. *Studii de limba română. Omagiu profesorului Grigore Brâncuş*, București, Editura Universității, pp. 203-208.

Topciu R. (2013), Frazeologie comună româno-albaneză, București, Editura Privirea.

# SYNTACTIC PARALLELISMS IN THE BULGARIAN AND ROMANIAN LANGUAGES

### Silvia Angelova, Assistant professor PhD,

Department of Philological Sciences, "Angel Kanchev" University of Ruse, Silistra Branch Phone:

E-mail: sangelova@uni-ruse.bg

**Abstract:** Parallelism is a stylistic figure by which images (figurative), episodes (plot) or syntactic constructions (syntactic) are juxtaposed. It is a comparison of two phenomena by the method of their parallel description. In linguistics, it is the construction of phrases with the same structure. In a sentence, words take their place according to a certain rule. for a sentence to be correct, the order of the words must be followed, otherwise the meaning may be completely changed. In this linguistic phenomenon, the sentences have the same structure, the same separate parts, the same rhythm, the same word order.

The word syntax is borrowed from French (syntaxe), a word of Latin and Greek origin (syntaxis = syn - means "together" + taxis - "arrangement", "order"). The object of studying syntax in both Bulgarian and Romanian language is the set of rules for combining words into sentences (simple (proposition) and complex (phrase)) and the syntactic connections in these units.

Although the Romanian language belongs to the Eastern Romance sub-branch of Romance languages, the Romanian cultural and written tradition throughout the Middle Ages was mainly of Old Bulgarian origin, and until the 16th century the official language in Wallachia and Moldova, with influence in Transylvania, was Middle Bulgarian.

The report examines the commonalities in the syntax of the Bulgarian and Romanian languages, providing numerous examples to illustrate these parallels.

Keywords: syntax, parallelism, simple sentences, phrases, juxtaposition, word order, generalities

#### REFERENCES

Вarkalova, P. Nedev. 2017. The Bulgarian syntax. Known and unknown. Sofia: "Paisiy Hilendarski" University Press (*Оригинално заглавие:* Бъркалова, П., 2017. Българският синтаксис. Познат и непознат. София: Университетско издателство "Паисий Хилендарски".)

Nedev, I. 1992. Syntax of the modern Bulgarian literary language. Varna: Bryag-print Press (**Оригинално заглавие:** Недев, Ив., 1992. Синтаксис на съвременния български книжовен език. Варна: Издателство "Бряг-принт".)

Ророv, К. 1998. Syntax of the literary Bulgarian language. Veliko Tarnovo: Abagar Press (**Оригинално заглавие:** Попов, К., 1998. Синтаксис на българския книжовен език. Велико Търново: Издателство "Абагар".)

Diaconescu, I., Probleme de sintaxă a limbii române actuale, Ed. Dacia, București, 2002.

Gioroceanu, A. Sintaxa limbii române. Note de curs. URL:

https://www.studocu.com/ro/document/universitatea-stefan-cel-mare-suceava/literatura-romana/sintaxa-limbii-romane-gramatica/21901333 (Accessed on 23.10.2022).

Nagy, R. Sintaxa limbii române actuale, Institutul European, 2005

# THE PROBLEM OF THE IDENTITY CRISIS IN THE NOVEL "HAIKA ZA WOLTSI" BY IVAYLO PETROV

### Assoc. Prof. Rumyana Lebedova, PhD

Department of Philology and Natural Sciences, Silistra Branch, "Angel Kanchev" University of Ruse Phone: 0887632741 E-mail: rlebedova@uni-ruse.bg

**Abstract:** The text interprets the theme of the personality crisis in the novel "Haika za woltsi" by Ivaylo Petrov. t traces the ways in which was build the story of the life in the Bulgarian village before and after the land cooperation in the years of socialism. The change of values is presented, which determines the drama of the man who has lost his supports. The psychological mechanisms through which the identity crisis was revealed in the various characters were observed.

Keywords: literature, ideology, identity, drama, crisis

## REFERENCES

Avtorkhanov, A. (1994). Technology of power. Volume 1. Sofia: Ed. "Hristo Botev" house.(*Оригинално заглавие*: Авторханов, А.(1994). Технология на властта. Том 1. София : Изд. къща "Христо Ботев".)

Gabe, D. The Golden Land. (1954). DCIA, F. 1771, op. 1, a. f. 174. (*Оригинално заглавие:* Габе, Д. Златната земя. (1954). ДЦИА, Ф. 1771, оп. 1, а. е. 174. )

Erickson, E. (1996). Identity: Youth and Crisis. Sofia: Science and Art. (*Оригинално заглавие:* Ериксън, Е. (1996). Идентичност: Младост и криза. София: Наука и изкуство.)

Ророv, Ch. (2019) Totalitarian art. Ideology, organization, practice. Sofia: "St. Cl. Ohridski".(*Оригинално заглавие:* Попов, Ч. (2019) Тоталитарното изкуство. Идеология, организация, практика. София: УИ "Св. Кл. Охридски".)

## FRI-110-2-PP(S)-01

# FUNCTIONAL USES OF TH`1`1ZXE SUBORDINATE CONJUNCTIONS "QUE" AND "'4E" IN THE ORAL PRACTICE OF FRENCH AND BULGARIAN

Assoc. Prof. Veska Kirilova, PhD Faculty of Modern Languages St. Cyril and St. Methodius University, Veliko Turnovo, Bulgaria Phone: 062 618 283 E-mail: v.dimitrova@ts.uni-vt.bg

**Abstract:** The article examines cases of non-normative use of the subordinate conjunctions "que" and "ve" in the oral practice of the French and of the Bulgarian languages. They introduce hypotactic relations of complementarity within the complex sentence and they also serve to establish causal relations, relations of consequence, of concession, of purpose, and in French also of temporality and of condition. The formal-semantic restructuring of the conjunctions, reduced to subordinate conjunction "que" and "ve", introducing the considered types of hypotactic relations, is the result of three linguistic processes: substitution (complete or partial), ellipsis and truncation. The study finds a tendency in the oral practice of both languages to unify most of the subordinate conjunctions in the form of simple que / ve conjunctions.

Keywords: subordinate conjunction, que, че, hypotactic relations, oral practice, French, Bulgarian

### REFERENCES

Arrivé, M. Gadet, F. & Galmiche, M. (1986). La grammaire d'aujourd'hui. Paris: Flammarion.

Blanche-Benveniste, C. (2002). Quel est le rôle du français parlé dans les évolutions syntaxiques ? in Information grammaticale, Juin, n 94, p. 11-17.

Brunot, F. (1899). Précis de grammaire historique de la langue française. Paris&<sup>Cie</sup>Editeurs.

Bussi, M. (2016). Le temps est assassin. French and European Publications INC.

Delacourt, G. (2011). L'écrivain de la famille. Paris: JC Lattès.

Foenkinos, D. (2012). Je vais mieux. Paris: Gallimard.

Frei H. (1929). La grammaire des fautes. Genève : Slatkine.

Gadet, F. (1989). Le français ordinaire. Paris : Colin.

Gadet, F. (1992). Le français populaire. Paris : PUF.

Grévisse, M. (1964). Le bon usage. Belgique: Duculot, Gembloux.

Grevisse, M. & Goose (2008). Le bon usage. Paris: De Boeck & Larcier s.a., 14e édition

GSBKE (1983). Volume 3. Syntax, edited by Tilkov, Stoyanov, Popov, Sofia: BAS (**Оригинално заглавие:** ГСБКЕ (1983). том 3. Синтаксик, под редакцията на Тилков, Стоянов, Попов, София: БАН)

Hamon, A. (2007). Grammaire et analyse. Analyse grammaticale et logique. Paris: Hachette. Le Goffic, P. (2019). Grammaire de la subordination en français. Paris: Editions Ophrys.

Могтаrevi Brothers (2006). Lily. Sofia: Trud Publishing House (*Оригинално заглавие:* Братя Мормареви (2006). Лили. София: Издателство "Труд")

Ророv, К. (1963). Contemporary Bulgarian language – syntax. Sofia: Science and Art (**Оригинално заглавие:** Попов, К. 1963 Съвременен български език – синтаксис, София: Наука и изкуство)

Riegel, M. Pellat, J-Ch. & Rioul, R. (1994). Grammaire méthodique du français. Paris: PUF.

Slavov, S. (1993). Samodivata, Sofia: Florir Publishing House (*Оригинално заглавие:* Славов, С. (1993). Самодивата, София:ИК "Фльорир")

Steinberg, N. (1966). Grammaire française. Москва: Просвещение.

Stoyanova, N. (2019). Lexico-semantic representation in Bulgarian and in French of the idea of border through the words border and limit, frontière and limite.// Reports from the International Annual Conference of the Institute for the Bulgarian Language "Prof. Lyubomir Andreychin" 2019. Sofia: BAS Publishing House "Prof. Marin Drinov", pp. 281-288. (*Оригинално заглавие:* Стоянова, Н. (2019) Лексико-семантична репрезентация на български и на френски на идеята за граница чрез думите граница и предел, frontière и limite.// Доклади от Международната годишна конференция на Института за български език "Проф. Любомир Андрейчин" 2019. София: Издателство на БАН "Проф. Марин Дринов", с. 281-288.)

Stoyanova, N. (2009). Some features of the French prepositional locative expressions and their transitive use// Proceedings of the Scientific Conference "Contemporary Education and a Foreign Language", May 2008. Ed. Bozhidar Pitev, Diana Piteva. Veliko Tarnovo: Astarta, pp. 35-43. (*Оригинално заглавие:* Стоянова, Н. (2009). Някои особености на френските предложни локативни изрази и тяхната преносна употреба// Сборник от Научната конференция «Съвременно образование и чужд език», май 2008 г. Ред. Божидар Питев, Диана Питева. Велико Търново: Астарта, с. 35-43)

Vendryès, J. (1921). Le langage. Introduction linguistique à l'histoire, Paris: La renaissance du livre.

Wagner, Pinchon 1962: Wagner, R. L. J. Pinchon. Grammaire du français classique et moderne. Paris: Hachette.

# LEXICAL ASYMMETRY BETWEEN THE BULGARIAN NOUNS *БРЯГ* AND *PЪБ* AND THE FRENCH NOUN *BORD*

Senior Lecturer Nevena Stoyanova, PhD Department of Romance Languages St. Cyril and St. Methodius University, Veliko Turnovo, Bulgaria E-mail : n.stoyanova@ts.uni-vt.bg

**Abstract:** The results presented in this study are obtained from a comparison of translations between the two languages, organized around the idea of a border and its lexicalization in French and in Bulgarian. They are complemented by an account of the history, lexical combination and word-formation capacity of words and provide further information on the process of colexification, whereby the same word ('bord' for French and '6pse', for Bulgarian) expresses two or more concepts conveyed by different words in other languages.

Keywords: cross-language lexical asymmetry, cross-linguistic polysemy

## REFERENCES

Boyadzhiev T. (2007) Balgarska leksikologiya, SU, Sofiya (*Оригинално заглавие:* Бояджиев Т., Българска лексикология, СУ, София)

Cardinal M. (1975) Les mots pour le dire. Bernard Grasset (*npebod – Moŭ*)

Charrière H. (1992) Anri Sharier. Peperudata. IK "Sibiya", translated by Vera Dzhambazova. (**Оригинално заглавие:** Анри Шариер. Пеперудата. ИК "Сибия", 1992. Превод от френски: Вера Джамбазова.)

Charrière H. (1972). Papillon. Robert Laffont.

Darcy I., Daidone, D., & Kojima, C. (2013). Asymmetric lexical access and fuzzylexical representations in second language learners. The Mental Lexicon, 8(3), 372-420. http://dx.doi.org/10.1075/ml.8.3.06dar

Gracq J. (1991). La Presqu'île. José Corti (превод – мой)

Kirilova V. (2009). Réflexions sur l'acquisition de la compétence socioculturelle en langue étrangère. – In : 45 godini Filologicheski fakultet. V. Tarnovo: UI " Sv. sv. Kiril i Metodiy", s. 17– 26. (**Оригинално заглавие:** Кирилова, В. (2009). Réflexions sur l'acquisition de la compétence socioculturelle en langue étrangère. – В : 45 години Филологически факултет. В. Търново: УИ "Св. св. Кирил и Методий", с. 17–26)

Kirilova, V. (2008). Le message publicitaire – réception, décodage, persuasion et adhésion – In : Sb. ot konf. "Savremenno obrazovanie i chuzhd ezik", May 2007. Red. G. Varlinkova, V. Stoyanova, M. Hristova. V. Tarnovo: "Astarta", s. 171–180. (*Оригинално заглавие: Кирилова, В. (2008). Le message publicitaire – réception, décodage, persuasion et adhesion Сб. от конф. "Съвременно образование и чужд език", май 2007. Ред. Г. Върлинкова, В. Стоянова, М. Христова. В. Търново: "Астарта", с. 171–180)* 

Modiano P. (1975) Villa triste, Gallimard, Paris.

Modiano P. (1980) Vila "Taga". DI "Narodna kultura", translated by Penka Proykova (*Оригинално заглавие:* Патрик Модиано. Вила "Тъга". ДИ "Народна култура", превод от френски Пенка Пройкова)

Ray A. (1998) Dictionnaire historique de la langue française, Paris, Le Robert.

Rzymski, C., Tresoldi, T., Greenhill, S.J. et al. (2020) The Database of Cross-Linguistic Colexifications, reproducible analysis of cross-linguistic polysemies. Sci Data 7, 13 /2020.

Semenov A.V. (2003) Etimologicheskiy slovar' russkogo yazyka. Moskva (*Оригинално* заглавие: Семенов А.В. Этимологический словарь русского языка. Москва)

Shanskiy N.M. (2004) Shkol'nyy etimologicheskiy slovar' russkogo yazyka. Proiskhozhdeniye slov/ N.M. Shanskiy, T.A. Bobrova. — 7-ye izd., stereotip. — М.: Drofa. (**Оригинално заглавие:** Шанский Н.М. Школьный этимологический словарь русского языка. Происхождение слов/ Н.М. Шанский, Т.А. Боброва. — 7-е изд., стереотип. — М.: Дрофа)

Yourcenar M. (1968) L'œuvre au noir, Gallimard.

Yourcenar M. (1984) Tvorenie v cherno. Izdatelstvo: Profizdat, translated by Krasimir Mirchev (**Оригинално заглавие:** Творение в черно. Издателство: Профиздат. Превод от френски: Красимир Мирчев)

# ON AN INTERESTING USE OF SIMPLE SENTENCES WITH RELATIVE SEMANTICS IN YOVKOV'S STORIES

### Donka Ilieva

Vasil Levski High School – Dulovo Phone: +359 88 636 8008 E-mail: drilieva@uni-ruse.bg

**Abstract:** Yovkov's style is characterized by rich imagery; he uses an abundance of epithets, metaphors, attributive phrases, etc. The writer avoids brevity, he uses it much less often, therefore there are not many simple sentences with relative semantics in his stories. The report places an emphasis precisely on the laconic expressions in Yovkov's stories, and also: to discover the different Yovkov, by making sense of simple sentences with relative semantics. In the excerpted material presented, I have selected just such sentences: laconic, concrete and - at the same time - figurative.

*Keywords:* simple sentences with relative semantics, syntax, concessions *JEL Codes:* L29

### REFERENCES

Dobrev, D. (1983). Za ciklichnostta v tvorchestvoto na Jovkov. // Ezik i literatura, № 2. (**Оригинално заглавие:** Добрев, Д. (1983). За цикличността в творчеството на Йовков. // Език и литература, № 2).

Igov, S. (1991). Balkanyt, Hanyt i Chiflikyt u Jordan Jovkov. // Igov, S. Ot Botev do Jovkov. Sofiia. (**Оригинално заглавие:** Игов, С. (1991). Балканът, Ханът и Чифликът у Йордан Йовков. // Игов, С. От Ботев до Йовков. София).

Lebedova, R. (2016). Mityt "Zlatna Dobrudzha" i Jordan Jovkov // V: Periodichno izdanie "Dobrudzha", Br. 31, s. 98-114. (**Оригинално заглавие:** Лебедова, Р. (2016). Митът "Златна Добруджа" и Йордан Йовков // В: Периодично издание "Добруджа", Бр. 31, с. 98-114).

Stankov, Iv. (1995). Jovkovoto tvorchestvo. V. Tyrnovo. (Оригинално заглавие: Станков, Ив. (1995). Йовковото творчество. В. Търново).

# THE SOTERIOLOGICAL LOGOS IN BEATRICE AND ALBENA

### Vladi Vladev

Language School "Peyo Yavorov", Silistra E-mail: vladi.vladev@eg-yavorov.com

**Abstract:** The article compares the images of Albena from the story of the same name by the Bulgarian writer Yordan Yovkov and Beatrice from Dante's book Vita Nova in order to discover their common Christological and soteriological structure. First, the logos of beauty of Dante's beloved is analysed, bringing out three elements for comparison: beauty as a spiritual dimension, woman as a bearer of wonder and the effects of the magical power of beauty on others. After that these elements are traced and found in the image of Albena in the episode of taking of the beautiful sinner in front of the eyes of the village community, which gives reason to make a new, soteriological, reading of this emblematic text of Bulgarian literature.

Keywords: : Yovkov, Albena, Dante, Beatrice, Vita Nova, soteriology.

### REFERENCES

Alighieri, D. (2016). Vita Nova. Milano: Mondadori Libri S.p.A.

Rea, R. (2018). Amore e ragione nella Vita nuova. Studj Romanzi, XIV.

D'Avenia, A. (2015). Una cosa venuta da cielo in terra a miracol mostrare: come salvarsi dalla noia con la Vita Nova di Dante. Incontro tenuto nell'Auditorium del Palazzo della Gran Guardia di Verona il 25 gennaio 2015. URL: https://www.youtube.com/watch?v=xeTgeavqr38 (Accessed on 03.09.2022).

Florensky, P. (2013). The Pillar and Ground of the Truth. Sofia (*Оригиално заглавие:* Флоренски, П., 2013. Стълб и крепило на истината. София.)

# STUDIES ON ARTISTIC STYLE IN BULGARIAN METHODICAL LITERATURE

**Tanya Encheva** Vasil Levski High School – Dulovo phone: +359 899 816 775 E-mail: tanyaencheva@mail.bg

**Abstract:** Artistic style occupies a special place among the styles of literary language. It is among the most important sources for enriching the literary language, it also serves as the main means of preserving vocabulary. The introduction of new words and meanings, as well as the preservation of long-established names and linguistic forms, is due to the use of fiction. Through literary texts, students have the opportunity to develop their ideas about both the real world and new fictional worlds. The report traces some of the studies on artistic style in the Bulgarian methodological literature.

*Keywords:* art style, literature, style, teaching *JEL Codes:* L29

### REFERENCES

Angelov, B. 1907. Stilistika. Uchebnik za IV klas na myzhkite i devicheski gimnazii. Systavil syglasno programata B. Angelov, uchitel ot II-ta D. M. Gimnaziia v Sofiia. Plovdiv, Izdanie i pechat na Hr. G. Danov. (*Оригинално заглавие:* Ангелов, Б. (1907). Стилистика. Учебник за IV клас на мъжките и девически гимназии. Съставил съгласно програмата Б. Ангелов, учител от II-та Д. М. Гимназия в София. Пловдив, Издание и печат на Хр. Г. Данов).

Boiadzhiev, T., Kucarov, Iv., Penchev, J., (1999). Syvremenen bylgarski ezik, Stilistichno razsloenie na leksikata, Sofiia. (*Оригинално заглавие:* Бояджиев, Т., Куцаров, Ив., Пенчев, Й. (1999), Съвременен български език, Стилистично разслоение на лексиката, София).

Georgiev, S., R. Rusinov. (1983). Hudozhestven stil. Uchebnik po leksikologiia na bylgarskiia ezik, Sofiia. (*Оригинално заглавие:* Георгиев, С., Р. Русинов. (1983). Художествен стил. Учебник по лексикология на българския език, София).

Dobrev, D., T. Teneva. (1994). Literaturno obrazovanie i interpretaciia na hudozhestven tekst v uchilishte. Izd. Glauks, Shumen. (**Оригинално заглавие:** Добрев, Д., Т. Тенева. (1994), Литературно образование и интерпретация на художествен текст в училище. Изд. Глаукс, Шумен).

Pashov, P., VI. Georgiev, Iv. Dobrev (1981). Bylgarskiiat ezik – ezik na 13-vekovna dyrzhava, Izd. Narodna prosveta, Sofiia. (*Оригинално заглавие:* Пашов, П., Вл. Георгиев, Ив. Добрев. (1981). Българският език – език на 13-вековна държава", Изд. Народна просвета, София).

Rusev, R. i dr. (2007). V ogledalniia sviat na ezika i kulturata". Ruse, (v syavtorstvo). (**Оригинално заглавие:** Русев, Р. и др. (2007). В огледалния свят на езика и културата". Русе, (в съавторство)).

Rusev, R. (2013). Uchebnikyt po stilistika na Bozhan Angelov, NAUChNI TRUDOVE NA RUSENSKIIa UNIVERSITET, tom 52, seriia 6.3. (*Оригинално заглавие: Русев, P. (2013),* Учебникът по стилистика на Божан Ангелов, НАУЧНИ ТРУДОВЕ НА РУСЕНСКИЯ УНИВЕРСИТЕТ, том 52, серия 6.3)

# STYLISTICS OF SANCTITY IN THE STORY "THE REAPER" BY YORDAN YOVKOV

### **Ivelin Iliev**

Vasil Levski High School – Dulovo Phone: +359 89 369 8841 E-mail: iiliev@uni-ruse.bg

**Abstract:** Without losing its philosophical depth and invitation to reflection, Yordan Yovkov's style is ethereal and dotted with countless intellectual challenges. Like a sculptor, he separates the excess from the marble and gives grace to the figures in the language. His unusual linguistic solutions create a sense of stylistic comfort in the reader. He transforms the common man's understanding of holiness and conveys it in detail.

Keywords: icon, iconography, art, Christianity

### REFERENCES

Nanchev, J. (2011). Grehyt i pokaianieto ili pobeda nad zloto v "Zhytvariat" na Jordan Jovkov. Literaturen sviat)(**Оригинално заглавие**: Нанчев, Й. (2011). Грехът и покаянието или победа над злото в "Жътварят" на Йордан Йовков. Литературен свят)

Міteva, Kr. (2003). Niakoi nabliudeniia vyrhu funkciiata na ikonata v Jovkovata povest "Zhetvariat"// V: Elektronno spisanie LiterNet, 26.01.2003, № 1 (38)). (*Оригинално заглавие: Митева, Кр. Някои наблюдения върху функцията на иконата в Йовковата повест* "Жетварят"// В: Електронно списание LiterNet, 26.01.2003, № 1 (38)).Виж на: https://liternet.bg/publish4/kmiteva/ikonata.htm - посетен на 09.09.2022

Lebedova, R., R. Radev. (2008). Sbydnati pytuvaniia na duha chevz slovoto i plastikata. Izd. FABER, Veliko Tyrnovo. (*Оригинално заглавие*: Лебедова, Р., Р. Радев. (2008). Сбъднати пътувания на духа чевз словото и пластиката. Изд. FABER, Велико Търново).

Lebedova, R. (2016). Mityt "Zlatna Dobrudzha" i Jordan Jovkov // V: Periodichno izdanie "Dobrudzha", Br. 31, s. 98-114. (**Оригинално заглавие**: Лебедова, Р. (2016). Митът "Златна Добруджа" и Йордан Йовков // В: Периодично издание "Добруджа", Бр. 31, с. 98-114).

Canov, Str. (1995). Za religioznite kodove na bylgarskata literatura. Izd. Antos, Shumen.(*Оригинално заглавие: Цанов, Стр. (1995). За религиозните кодове на българската литература. Изд. Антос, Шумен.*)Виж на https://literaturensviat.com/?p=40289 – посетен на 20.09. 2022
## FRI-110-1-ITS(S)

### FRI-110-1-ITS(S)-01

## **DIGITAL CREATIVITY IN CREATING E-LESSONS**

Assoc. Prof. Evgenia Goranova, PhD Department of Philologocal and Natural Sciences, Silistra Branch, University of Ruse 'Angel Kanchev' Phone: 086-821 521 E-mail: egoranova@uni-ruse.bg

**Abstract:** The purpose of the report is to consider the transformation of the acquired digital competence into digital creativity in the creation of electronic lessons by the students - future teachers of physics and informatics. It examines those areas of the European Framework for Digital Competence of Educators that students have mastered in their studies and can transform into digital creativity through the lens of the digital taxonomy.

*Keywords:* Digital competence, Digital creativity, E\_lessons, Digital taxonomy *JEL Codes:* 120, 121

### REFERENCES

Churches, A. (2008). Bloom's Digital Taxonomy. URL: http://burtonslifelearning.pbworks.com/f/BloomDigitalTaxonomy2001.pdf

DigCompEdu (2022). URL: https://joint-research-centre.ec.europa.eu/digcompedu\_en/.

Goranova, E.(2029). Creation of Electronic Learning Objects for the High Cognitive Levels of Bloom's Digital Taxonomy, *KNOWLEDGE-International Journal*, vol. 31, no. 2, pp. 585-590.

Goranova, E., Tuparova, D., & Teodosieva, M., One Approach for Development and Assessment of ICT Teachers Competencies in Multimedia Educational Environment, *Global Journal on Technology, Vol 5, pp.184-190, 2014* 

Kojuharova, D., 2020. from digital competence to digital creativity. Stara Zagora: Academic Publishing House, Thracian University (*Оригинално заглавие:* Кожухарова, Д., 2020. От дигитална компетентност към дигитална креативност, Стара Загора: Академично издателство, Тракийски университет).

## FRI-110-1-ITS(S)-02

# AN INVESTIGATION OF THE ELECTRIC VOLTAGE QUALITY OF POWER SUPPLY OF AN INDUSTRIAL INDUCTION FURNACE

### Assist. Svetlozar Grigorov, M.Sc.Eng. - PhD Student

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

Assoc. Prof. Konstantin Koev, PhD

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

**Abstract:** The paper analyses some changes of electric voltage of power supply of a metal melting electric inductance furnace. The measurements of some of electric quantities have been made in the second of the furnace transformer and outside of the power electronic converter. The measurements were realized and results were recorded by three-phase power quality analyser MI 2885 Master Q4. The results are presented graphically and the electric voltage quality is analysed. The conclusions of experimental results can to use for development of technical solutions to improve the power quality of the power supply of the investigated induction furnace.

Keywords: metals melting electric inductance furnace, electric voltage quality.

### REFERENCES

BDS EN 50160:2010/A3:2020 Voltage characteristics of electricity supplied by public electricity networks. (*Оригинално заглавие:* БДС EN 50160:2010/A3:2020. Характеристики на напрежението на електрическата енергия, доставяна от обществените разпределителни електрически мрежи).

Belgaum Foundry Cluster, Best Operating Practices (2017), a **GEF-UNIDO-BEE Project**, Promoting Energy Efficiency and Renewable Energy in Selected MSME Clusters in India, Ministry of New and Renewable Energy, Bureau of Energy Efficiency, MICRO, SMALL & MEDIUM ENTERPRISES, https://beeindia.gov.in/sites/default/files/BOP-Belgaum.pdf.

Gönen, T. (2014) Electric Power Distribution Engineering. 3rd Edition, CRC Press, Boca Raton.

Iagar, A., G. N. Popa, C. M. Dinis (2009). Assessment of Power Quality for Line Frequency Coreless Induction Furnaces. WSEAS TRANSACTIONS on CIRCUITS and SYSTEMS, Issue 1, Volume 8, January, ISSN: 1109-2734.

Rajalakshmi, D., R.Kavitha, K.Premalatha (2019). Harmonic Research and Mitigation Techniques in Induction Furnace. International Journal of Engineering and Advanced Technology (IJEAT), Volume-8 Issue-6S, August 2019, ISSN: 2249 – 8958.

Stefanov, St., V. Ruseva (2010). Electric power supply. University of Ruse "Angel Kanchev" press, Ruse. (**Оригинално заглавие**: Стефанов, Ст., В. Русева (2010). Електроснабдяване. Русенски университет "Ангел Кънчев", Университетско издателство Русе).

Grigorov, Sv., K. Koev (2021). Investigation the electrical power quality of a metals melting electric induction furnace. 60<sup>th</sup> Science Conference of Ruse University - Ruse. (*Оригинално заглавие:* Св. Григоров, К. Коев (2021). Изследване качеството на електрическата енергия на електрическа индукционна пещ за топене на метали. 60-та научна конференция на Русенския университет "Ангел Кънчев").

Grigorov, Sv., K. Koev (2022). Investigation on some electrical power quality indices of a metals melting electric induction furnace. Proceedings 61<sup>st</sup> Science Conference of Ruse University – SSS Ruse, volume 61, book 11.4, ISSN: 1311-3321). (Оригинално заглавие: Св. Григоров, К. Коев (2022). Изследване на някои показатели на качеството на електрическата енергия на електрическа индукционна пещ за топене на метали. Сборник доклади на 61-а научна конференция на Русенския университет "Ангел Кънчев" - Студентска научна сесия, Том 61, серия 11.4, ISSN: 1311-3321). Роwer Quality Analyser MI 2885 Master Q4. Manual. Metrel, 2021.

## FRI-110-1-ITS(S)-03

# SYNTHESIS AND APPLICATION OF PHOSPHORUS CONTAINING COMPOSITES AS ELECTROCATALYTIC MATERIALS

## Assist. Prof., Ivelina Tsacheva, PhD

Institute of Polymers-BAS, Sofia, Bulgaria Tel.: +359 2 979 66 32 E-mail: itsacheva@polymer.bas.bg

### Res. Assoc., Mariela Dimitorova, PhD

Institute of Electrochemistry and Energy Systems "Academician Evgeni Budevski", Bulgarian Academy of Sciences, Bulgaria Tel.: +359 2 979 2708 E-mail: mariela.dimitrova@iees.bas.bg

### Adriana Gigova

Institute of Electrochemistry and Energy Systems "Academician Evgeni Budevski", Bulgarian Academy of Sciences, Bulgaria Tel.: +359 2 979 2719 E-mail: a.gigova@iees.bas.bg

### Res. Assist., Ognyan Dimitrov

Institute of Electrochemistry and Energy Systems "Academician Evgeni Budevski", Bulgarian Academy of Sciences, Bulgaria Tel.: +359 2 979 39 91 E-mail: ognian.dimitrov@iees.bas.bg

## Res. Assoc., Dzhamal Uzun, PhD

Institute of Electrochemistry and Energy Systems "Academician Evgeni Budevski", Bulgarian Academy of Sciences, Bulgaria Tel.: +359 2 979 2757 E-mail: dzhamal.uzun@iees.bas.bg

**Abstract:** The newly synthesized composites based on natural zeolite modified with Cellulose phosphate by microwave-assisted synthesis are reported here. Microwave irradiation conditions, such as irradiation power and time, required to optimize the synthesis of zeolite electrochemical materials were studied.

The growing interest in the use of zeolite-modified electrodes results from the specific framework structure, containing the three-dimensional system of cages, and channels with various shapes, sizes, and topologies (Chen, C.Y., et al). their molecular sieve properties and ability to undergo the ion-exchange process with transition metals result in their catalytic property (Guzmán-Vargas, A., et al; Porada, R., et al). Cellulose-based materials also show interesting electrochemical properties and will be interesting to study their application of it for hydrogen production (Marzouki, R., et al).

The electrolytic model solution content of 1 M KOH and 18 g.l<sup>-1</sup> NaCl. The electrocatalysts were characterized by SEM, XRD, and BET. The electrodes are studied electrochemically by means of cyclic voltammetry, galvanostatic measurements, and Tafel slopes. The electrodes are designed and optimized in terms of the amount of composites.

Keywords: microwave assisted synthesis, cellulose phosphate, natural zeolite, seawater, electrocatalysts

## REFERENCES

Chen, C.Y., Ouyang, X., Zones, S.I. Banach, S.A., Elomari S.A., Davis, T.M., Ojo, A.F. (2012). *Microporous Mesoporous Mater.*, 164, 71-81.

Guzmán-Vargas, A., Oliver-Tolentino, M.A., Lima, E., Flores-Morenod, (2013). J. Electrochim. Acta., 108, 583-590.

Marzouki, R., Brahmia, A., Q. Alsulami, A, Keshk SMAS, Emwas A.-H., Jaremko, M., Zid, M.F., Heinze, T. (2021). *Polymer International*, 70, 1290-1297.

Porada, R., Fendrych, K., Baś, B. (2021). Measurement, 179, 109450-109461.

### FRI-110-3-ITS(S)-04

## STATE OF THE CAR FLEET IN EUROPE

### Principal Assist. Prof. Milen Sapundzhiev, PhD

Department of Philologocal and Natural Sciences, Silistra Branch, University of Ruse "Angel Kanchev" E-mail: milenvs@abv.bg

### Principal Assist. Prof. Valentin Manev, PhD

Department of Philologocal and Natural Sciences, Silistra Branch, University of Ruse "Angel Kanchev" E-mail: vmanev@mail.bg

Abstract: The report provides an overview of the state of the vehicle fleet in Europe for the last 5 years. The analysis was made by car types for individual countries.

Keywords: transport, vehicles JEL Codes:

### REFERENCES

Vehicles in use Europe 2022, ACEA - European Automobile Manufacturers' Association

European vehicle market statistics, International Council on Clean Transportation Europe, Pocketbook 2021/22

Commercial Vehicle of the Future, Transport & Mobility Leuven and IRU contribution, 2017.

### FRI-110-3-ITS(S)-05

## SMART CONTROL OF PARAMETERS IN AUTONOMOUS HEN HOUSE

### Eng. Ivan Ivanov

Department of Automatics and Mechatronics, "Angel Kanchev" University of Ruse, Bulgaria E-mail: ivan\_ivanov89@abv.bg

#### Assist. Prof. Nikolay Valov, PhD

Department of Automatics and Mechatronics, "Angel Kanchev" University of Ruse, Bulgaria phone: +359 (082) 888 266 E-mail: npvalov@uni-ruse.bg

### **Eng. Vladimir Canknov**

Department of Electronics, "Angel Kanchev" University of Ruse, Bulgaria E-mail: vladimir\_cankov@mail.bg

**Abstract:** This paper describes the technical and program solution to a specific problem in the rearing of birds in a small chicken coop. In the realization of the system, modules were selected to implement the set of the functionalities. The main ones are: microcontroller WeMOS D1 Mini, sensors - ANT10, MQ135, LDR and step motor - 28BYJ-48. The developed application is WEB-based and allows remote monitoring and management of the system via the Internet. a control system for the entrance door of the chicken coop can be a successful competitor to the devices of this type offered on the market with its good functionality and low cost. Its autonomous power supply makes the device independent of the power grid and can be used in isolated livestock farms, as the low value of the operating voltage of the power supply unit (5V) makes the device safe for the user and the birds in the room.

Keywords: Arduino, ESP8266, sensors, actuators, automatic chicken door.

### REFERENCES

Budiman, F., Rivai, M., & Nugroho, M. A. (2019, August). Monitoring and control system for ammonia and ph levels for fish cultivation implemented on raspberry pi 3B. In 2019 International Seminar on Intelligent Technology and Its Applications (ISITIA) (pp. 68-73). IEEE.

Yagade, B. (2015). Automated Solar-Powered Chicken Coop Door., https://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1161&context=cpesp

Chaudhary, S., Bhargave, V., Kulkarni, S., Puranik, P., & Shinde, A. (2018). Home Automation System Using WeMos D1 Mini. *International Reseach Journal of Engineering Technology*, 5(5), 4238-4241.

Syahrorini, S., Rifai, A., Saputra, D. H. R., & Ahfas, A. (2020, June). Design smart chicken cage based on internet of things. In *IOP Conference Series: Earth and Environmental Science* (Vol. 519, No. 1, p. 012014).

Koptelova, M. A., & Borisov, A. P. (2016) Building an intelligent automation system "smart home" on the wemos d1 mini microcontroller. In *Interaction of Science and Society: Problems and Prospects*, p.40-42 (*Оригинално заглавие:* Коптелова, М. А., & Борисов, А. П. (2016). Построение интеллектуальной системы автоматизации" умный дом" на микроконтроллере wemos d1 mini. In *Взаимодействие науки и общества: проблемы и перспективы*, стр. 40-42).

Описание на сензор AHT10 от производителя Guangzhou Aosong Electronic Co., Ltd., http://www.aosong.com/en/products-40.html

Описание на сензор MQ135 от производителя Zhengzhou Winsen Electronics Technology Co., Ltd., https://www.winsen-sensor.com/sensors/voc-sensor/mq135.html

### FRI-216-1-ITS(S)-06

# INVESTIGATION OF THE INFLUENCE OF THE SIZE OF THE AIR GAP BETWEEN THE SOLENOID AND THE UNLOADER VALVE ARMATURE ON HYDRAULIC CHARACTERISTICS OF ELECTROMAGNETIC INJECTORS CRI 1

## Principal Assist. Prof. Valentin Manev, PhD

Department of Philologocal and Natural Sciences, Silistra Branch, University of Ruse "Angel Kanchev" E-mail: vmanev@mail.bg

### Principal Assist. Prof. Milen Sapundzhiev, PhD

Department of Philologocal and Natural Sciences, Silistra Branch, University of Ruse "Angel Kanchev" E-mail: milenvs@abv.bg

**Abstract**: The report describes an experiment investigating of the influence of the size of the air gap between the solenoid and the unloader valve armature on the hydraulic characteristics of electromagnetic injectors Common Rail. The first generation electromagnetic injectors - BOSCH CRI1 was selected as the study object. The tests were made on a universal test bench for CMX6000X diesel fuel systems.

Keywords: Common Rail, hydraulic characteristics, electromagnetic injectors

### REFERENCES

1. Diesel engine control systems, Robert Bosch GmBH, 2004

2. Hammer J., Einspritztechnik, Universitat Stuttgart, 2011

3. Uzuntonev, Tr., "Adjustment and testing of electromagnetic nozzles from the Common Rail system", Proceedings of scientific conferences of RU "A. Kanchev "2009, volume 48, series 4, pp. 37-41

4. Yordanov N., K. Hadjiev, E. Stankov, Experimental simulation of Common rail electromagnetic injectors wearing, International Scientific Journal "Machines. Technologies. Materials.", WEB ISSN 1314-507X; PRINT ISSN 1313-0226

5. www.bosch.com

## FRI-216-1-ITS(S)-07

# INTERACTIVE METHODS AND INNOVATIVE TECHNOLOGY FOR E-LEARNING THROUGH "YOUTUBE" CHANNEL

#### **Teacher Ventzislava Angelova**

High School of Industrial Technology Evlogiy Georgiev Silistra, Bulgaria Tel.: +898 252 032 E-mail: wenzi\_angelova@abv.bg

Abstract: Proper use of modern educational technology enhances the effectiveness of teaching and learning. However, this requires the use of new pedagogical approaches that allow for collaboration, communication and mobility. Such learning technologies include virtual worlds, interactive multimedia technologies, wireless technologies and the use of mobile devices. The research interest focuses on the topical issue of using computer-based educational and multimedia and digital technologies in the learning process in different disciplines and how the use of these particular technologies affects motivation to learn. It is becoming more and more clear that the attempts for structural, organisational and institutionally imposed changes will not lead to the desired result if opportunities are not found to improve the quality of the learning process 'from the inside' by rethinking the focus and characteristics of pedagogical impact and interaction. To achieve good results Bulgarian schools need innovators in the classroom who can intuitively feel the new trends, ask the right questions, formulate the tasks to get them solved and thereby be in line with the relevance of what is happening in society and the need for timely changes in education. The application of interactive methods enhances the effectiveness of learning, which depends on the degree of acquisition of knowledge and skills in the learning process, which forms relation to the field of study, i.e. technological learning. The effectiveness of learning is not only expressed in the formation and consolidation of knowledge and skills, but also in their transfer from one area to another and their application in different situations, which leads to the activation of students' cognitive activity in technology education classes. Cognitive activity is associated with positive motivation and sustained interest in the studied area. All this in aggregate is achieved by an appropriate combination of methods and means of learning through activity, and the most appropriate are innovative methods. I looked for an approach in which learners are engaged in active actions in gaining basic knowledge and enriching their knowledge. What is new about this approach is that the material is presented in the traditional way of teaching.

As a teacher of vocational subjects, I feel satisfied when I apply different interactive and innovative technologies-I use innovative technology of teaching through the "Youtube" channel in the classes of Teaching Practice - Technology and Technique of Food Production and Teaching Practice - Food Quality Control. Interesting results are obtained from its application. Students become more and more experienced, knowledged, skillful and competent in working on the subjects of vocational training. The use of the "YouTube" channel frees the teacher from the need to repeat well-learned lessons and allows for more active participation of students in the conduct of lessons.

Keywords: Modern education, Youtube, Teaching, New practice, Technology

## REFERENCES

Andreev, M. (1996). Didactics. Sofia: Narodna Prosveta press

Andreev, M. (1995). Evaluation in school. Sofia: St. Kliment Ohridsky press

Bizhkov, G. (1992). Methodology of innovation in education: innovation strategies. Sofia: Otvoreno obrazovanie press, №3, p.8-74

Kostova, Z., & Vladimirova, E. (2011). Interactive learning: essence, difficulties, theoretical foundations and critical evaluations. Educational and scientific policy strategies. S.19, p.203-238

### **OCTOBER RESEARCH CONFERENCE IN RUSE**

## **FRI-2G.204FS**

FRI-2G.204FS-01

## TECHNICAL ADVANCES AND TRENDS IN NEUROSURGERY FOR BETTER QUALITY OF LIFE

#### Dilyan Ferdinandov, MD, MPH, PhD, FEBNS,

Neurosurgeon, Assoc. Prof. Department of Agricultural Machinery, Phone: +359 888 678 549 Address: 15 Acad. Ivan Geshov Blvd, 1431 Sofia, Bulgaria E-mail: ferdinandov@gmail.com

**Abstract:** Latest technologies in the field of neurosurgery maximize patient safety and improve treatment outcomes. These advances are integrated into all aspects of clinical care - from diagnosis through surgery, postoperative care and rehabilitation. The current review will outline recent neurosurgical advances in the management of brain tumors, movement disorders, spinal degenerative disease, neurologic injury, and the expanding area of brain-machine interface. It is a complex and multidisciplinary knowledge related to the nervous system with overlapping aspects which are closely interconnected to elementary professional subjects such as science, technology, engineering, and mathematics. For example, minimally invasive surgical techniques are a part of the daily practice of many spine surgeons. They aim less tissue damage, predictable clinical outcomes, shorter hospital stays and faster postoperative rehabilitation, clinical efficacy, and reasonable cost. Based on the facts that our specialty relies on meticulous motor skills to carefully manipulate vulnerable structure, work through narrow areas, and prolonged procedures with surgeon fatigue, it is a good candidate for robotic surgery. To support all the additive manufacturing regarding 3D printing, the related 3D scanning and work in extended reality environment is described as a feature of the third industrial revolution. We will broadly use anatomic haptic models for preoperative planning, surgical guides for the operative procedure, and patient-specific individual implants for tissue reconstruction.

Keywords: minimally invasive surgery, robotic surgery, additive manufacturing, 3D technologies.

## FRI-2G.204FS-02

# THE INNOVATIVE ZELLKRAFT PROGRAM OF THE ROTHERBAUM CENTER FOR PREVENTION AND HEALTH MANAGEMENT -NOTICEABLY MORE ENERGY IN EVERY CELL OF THE HUMAN BODY

### D-r rer. nat. Dirk Wagener,

Corporate & Personal Health Consulting, Hamburg, Germany, Head of the innovative ZELLKRAFT program at the Rotherbaum Center for Prevention and Health Management – Hamburg, Germany. Tel: +49(0)178 610 2004, Fax: +49(0)40 / 2531 8963 E-mail: wagener@zell-kraft.de

**Abstract:** ZELLKRAFT is scientifically validated health training for targeted improvement of cellular metabolism. It functions exactly where a person's energy is created: in the powerhouses of the cell, the so-called mitochondria.

THIS MEANS: Improved performance, reduced recovery time, better memory, better sleep, better appearance through tighter skin and reduction of excess body weight. It is due to the release of various "good mood hormones" in the brain (neurotransmitters) that maintain mental balance.

THE METHOD: Targeted regeneration is at the heart of the ZELLKRAFT method. Energy production in the cells is enhanced by using high purity mountain air. This noticeably strengthens and revitalizes the entire body with all its organs and bodily functions. Through targeted additional measures in the field of fitness, nutrition and relaxation, the metabolism and cellular energy level are activated and restored in the long term.

#### FRI-2G.204FS-03

## INNOVATION IN TECHNOLOGY - FROM THE INVISIBLE AND IMPOSSIBLE TO THE FUTURE TODAY

### Academician Chavdar Rumenin

Institute of Robotics, BAS Director of the National Competence Center "Quantum communication, intelligent security systems and risk management" – QUAZAR Tel: (+359 2) 870 33 61 E-mail: roumenin@bas.bg

Abstract:. Fate is not always kind to seekers. The secrets of knowledge have never been hidden somewhere. But do we have the eyes to see them, the heart to feel them, and the mind to understand them, when the need to veer off the beaten and comfortable path overwhelms us. There are no ultimate truths, no fully described suffering or happiness, hope and disappointment will never cease to accompany us. That mystery of contemplating the starry sky and finding concrete earthly truths and technical solutions in infinity is a gift from God. We all know about the great discoveries, about the turning points in the development of civilization, science and technology. Aristotle, St. St. Cyril and Methodius, Galileo, Newton and Watt, Foucault and Lavoisier, Lobachevsky and Mendeleev, Poincaré, Gauss and Planck, Marconi and Tesla, Einstein and Freud, Nietzsche and Schopenhauer, Academician Pencho Slaveykov and Teodor Trayanov, Ivan Milev and Vladimir Dimitrov - Maistora, Yesenin and Acad. Sakharov, Acad. Bogdan Filov, John Atanasov, Acad. Balevsky and Acad. Sendov, etc., listing the names of these awakeners of the spirit and knowledge can be continued ad infinitum. For each one of them, we know how he reached and turned the invisible into the visible, the impossible into the possible, and gave us pieces of the future. And surely Leonardo da Vinci was right that in science the opinion of one is much more valuable than the convictions of thousands. Almost everything in engineering is borrowed from nature. However, there is one thing that is truly the pinnacle of human imagination and creative genius. This is the digital information - with only zeros and ones we control everything, really, absolutely everything! And without this "human" discovery, we will never create our best assistant - artificial intelligence. There is another miracle, but it is Bulgarian. This is our first and unsurpassed invention - the Bulgarian, our A a, B b, C c ..... The sacred symbols of the holy brothers Cyril and Methodius have given meaning to the power and culture of our great empire in the past, and now the progress that coming up.

It is not an exaggeration to say that what makes our lives more comfortable and meaningful is subject to invention. Technological solutions drive industry, finance, medicine, and all that we call the prosperity of individual countries. The more common word for the purpose is innovation or creativity. The simplest, but perhaps most accurate, definition of innovation is the transformation of the intellectual products contained in inventions into money, goods, and industrial development. This path is thorny for us. Not that bankers elsewhere give money easily for the transfer of patented technologies, but they are probably more risk-averse there.

My meeting with you is a kind of balance sheet - to present to the intellectual elite of Ruse the scientific and applied results that we managed to have today as particles or more precisely as dust particles from the future. The responsibility is huge, both to you and to the Taxpayer. Almost everything I'm about to tell you about is an invention. It was initially an idea, then it was theoretically researched and experimented to finally become a patent. We will talk about our innovations in sensors, robotics and metrology, airspace control, converting the energy of sea waves into electricity, earthquake prediction, smart agriculture and crop production, cyber-physical systems for national security, underwater devices for recreational tourism, etc.

## FRI-8.303b-1-AMT&ASVM

### FRI-303.b-1-AMT&ASVM-01

# ANALYSIS OF THE LEGUMINOUS CROPS PRODUCTION IN BULGARIA

### Assoc. Prof. Bozhidar Kolev, PhD

Department of Agricultural Machinery, "Angel Kanchev" University of Ruse Phone: +359 82 888 610 E-mail: bkolev@uni-ruse.bg

#### Assoc. Prof. Miroslav Mihaylov, PhD

Department of Agricultural Machinery, "Angel Kanchev" University of Ruse Phone: +359 82 888 342 E-mail: mmihaylov@uni-ruse.bg

Abstract: In this paper the production of leguminous crops in Bulgaria is analysed. These crops occupy a proper place in the agricultural crop rotation. The areas occupied by them, the production obtained, the influence of external factors on the latter, as well as the satisfaction of the domestic market with the main pulses - ripe beans and lentils, which are the main component food in the menu of Bulgarians - have been analysed. The presented data are for the period from 2012 to 2021. Conclusions are formulated for the future development of the production of leguminous crops in the country.

Key words: leguminous crops, occupied areas, production, yields, consumption

### REFERENCES

Newsletter No343. 2018. Ministry of Agriculture, Food and Forestry, Department of Agrostatistics, Sofia (*Opuzuhanho заглавие:* Бюлетин No343. 2018. Министерство на земеделието, храните и горите, отдел "Агростатистика", София) https://www.mzh.government.bg/bg/statistika-i-analizi/izsledvane-rastenievadstvo/danni/ (10.05.2022).

Newsletter №361. 2019. Ministry of Agriculture, Food and Forestry, Department of Agrostatistics, Sofia (*Оригинално заглавие:* Бюлетин №361. 2019. Министерство на земеделието, храните и горите, отдел "Агростатистика", София) https://www. mzh.government.bg/bg/statistika-i-analizi/izsledvane-rastenievadstvo/danni/ (10.05.2022).

Newsletter №375. 2020. Ministry of Agriculture, Food and Forestry, Department of Agrostatistics, Sofia (*Оригинално заглавие:* Бюлетин №375. 2020. Министерство на земеделието, храните и горите, отдел "Агростатистика", София) https://www. mzh.government.bg/bg/statistika-i-analizi/izsledvane-rastenievadstvo/danni/ (10.05.2022).

Newsletter №391. 2021. Ministry of Agriculture, Food and Forestry, Department of Agrostatistics, Sofia (*Opuzuhanho заглавие:* Бюлетин №391. 2021. Министерство на земеделието, храните и горите, отдел "Агростатистика", София) https://www. mzh.government.bg/bg/statistika-i-analizi/izsledvane-rastenievadstvo/danni/ (10.05.2022).

Newsletter №397. 2022. Ministry of Agriculture, Food and Forestry, Department of Agrostatistics, Sofia (*Оригинално заглавие:* Бюлетин №397. 2022. Министерство на земеделието, храните и горите, отдел "Агростатистика", София) https://www. mzh.government.bg/bg/statistika-i-analizi/statistichesko-nablyudenie-zaetost-i-izpolzvane-zemya/danni/(10.05.2022).

Newsletter №407. 2022. Ministry of Agriculture, Food and Forestry, Department of Agrostatistics, Sofia (*Оригинално заглавие: Бюлетин №407. 2022, Министерство на* 

земеделието, храните и горите, отдел "Агростатистика", София) https://www. mzh.government.bg/bg/statistika-i-analizi/izsledvane-rastenievadstvo/danni/ (10.05.2022).

Vasileva, L., 2015. Analysis of trends in the production of ripe field beans in Bulgaria. Ruse: Proceedings of the University of Ruse, volume 54, book 1.1 (*Оригинално заглавие:* Василева Л. 2015. Анализ на тенденциите за производство на зрял полски фасул в България. Научни трудове на Русенския университет, том 54, серия 1.1).

Сепsus'2021. 2022 National statistical institute, Sofia (*Оригинално заглавие:* Преброяване '2021. 2022 Национален статистически институт, София) https:// census2021.bg (05.10.2022).

Household consumption. 2021 National statistical institute, Sofia (*Оригинално заглавие:* Потребление на домакинствата. 2021. Национален статистически институт, София) https://www.nsi.bg/bg/content/3255/ (25.08.2022).

## FRI-303.b-1-AMT&ASVM-02

## DETERMINATION OF OPERATING AND ECONOMIC INDICATORS OF A PLANTER WITH DIFFERENT TRANSMISSION SYSTEMS

### Iliyan Bojkov

Regional Directorate of Agriculture, Pazardzhik Phone: 089 420 0201 E-mail: ilianbojkov@abv.bg

### Assoc. Prof. Dimitar Kehayov, PhD

Agricultural university - Plovdiv Phone: 088 689 8334 E-mail: dkechajov@au-plovdiv.bg

### Assist. Prof. Ivan Zahariev, PhD

Agricultural university - Plovdiv Phone: 088 698 1638 E-mail: zaharievbgr@abv.bg

Abstract: In practice, there are seeders for cereal crops with a different way of driving the seedapparatus. In the older row drills, there is a mechanical drive of the seedapparatus with chain and toothed gears or with variators. In newer sowing machines, the drive is most often mechatronic. The aim of the present study is to determine to what extent the type of drive of the seedapparatus will have an impact on the operating and economic indicators of the seeder. a seeder with a working width of 3 m was used, with the drive of the sowing devices with a gear reducer, a variator and a mechatronic system. It was established that regardless of the observed variant, the productivity remains constant, respectively – and the seasonal load. There is a clear difference in the cost price, which is due to the different deductions for depreciation, major and current repairs. These differences are the result of the different price of the selected system for driving the seeders, with the same remaining economic indicators such as costs for the tractor, for fuel, for the payment of the operator, etc.

**Keywords:** seeding, operational-economic indicators, drive of seedapparatus, mechanical and mechatronic systems.

## REFERENCES

Angelova V. 1999, Agrarian Economics, Sofia, University Publishing House "Economy", (**Оригинално заглавие:** Ангелова В., 1999, Аграрна икономика, София, Университетски издателство "Стопанство").

Вrichagina A., V. Palvinsky, B. Orlov, 2017, to the question of dosage of rapeseed with different types of seeding apparatus, Scientific and practical journal "Vestnik IrGSHA", V.80, p.73-78; (Оригинално заглавие: Бричагина А., В. Пальвинский, Б. Орлов, 2017, К вопросу дозирования семян рапса различными типами высевающих аппаратов, Научно-практический журнал "Вестник ИрГСХА", Выпуск 80, с.73-78).

Gorobey V., O.Tarimov, 2009, Research on the stability of the operation of the coil seeding apparatus from the electric drive, Scientific notes of the Krymskogo engineering-pedagogical university, issue 20, p.80-85; (*Оригинално заглавие:* Горобей В., О.Таримов, 2009, Исследование устойчивости работы катушечного высевающего аппарата от электропривода, Ученые записки Крымского инженерно-педагогического университета, вып.20, с.80-85).

Kolev K., 1999, Operation of the machine-tractor park, Dionis, Sofia; (*Оригинално* заглавие: Колев К., 1999, Експлоатация на машинно-тракторния парк, Дионис, София).

Kuvaytsev<sup>1</sup> V., N.Laryushin, A.Shukov, R.Devlikamov, 2014, Results of laboratory tests of the sowing machine, Machinery and equipment for the village, No. 8 (206), p.20-23, (*Оригинално* 

заглавие: Кувайцев<sup>1</sup> В., Н. Ларюшин, А. Шуков, Р. Девликамов, 2014, Результаты лабораторных исследований высевающего аппарата, Техника и оборудование для села, №8 (206), с.20-23).

Kuvaytsev<sup>2</sup> V., N.Laryushin, A.Shukov et al., 2014, Results of field studies of the experimental seeder SSV-3.5, Machinery and equipment for the village, No. 9, p.14-17, (*Оригинално заглавие:* Кувайцев<sup>2</sup> В., Н. Ларюшин, А. Шуков и др., 2014, Результаты полевых исследований экспериментальной сеялки ССВ-3,5, Техника и оборудование для села, №9, с.14-17).

Nikolov R., 2017, Technological Tables as a Factor in Optimizing the Production of Crop Production, Journal of the Union of Scientist-Varna 2017, Section "Economic Sciences", 1, p.104-110, (*Оригинално заглавие:* Николов Р., 2017, Технологичните карти като фактор за оптимизиране производството на растениевъдна продукция, Известия на съюза на учените-Варна 2017, секция "Икономически науки", 1, с.104-110).

Palevski P., P.Petrov, 2004, Collection of sample norms for mechanized works in agriculture, Academic Publishing House of Agricultural University, Plovdiv., (*Оригинално заглавие:* Палевски П., П.Петров, 2004, Сборник примерни нормативи за механизираните работи в земеделието, Академични издателство на АУ, Пловдив).

Petrov G., 1995, Example methodology for calculating the mechanized services in agriculture, Zemdelska tekhnika, no.23, p.6-7, **(Оригинално заглавие:** Петров Г., 1995, Примерна методика за изчисляване на механизираните услуги в земеделието, Земделска техника,  $N_{2.23}$ , c.6-7).

Stoyanov E., 2013, Theory of financial and economic analysis, Burgas, Libra scorp., (**Оригинално заглавие**: Стоянов Е., 2013, Теория на финансово-стопанския анализ, Бургас, Либра скорп).

Valiev A., B.Zaganshin, N.Semushkin, S.Yakhin, 2013, Machines for soil preparation and sowing of agricultural crops: regulation, adjustment and operation, Kazan, Publishing House of Kazan State Agrarian University, 156 р.; (*Оригинално заглавие: Валиев А., Б. Заганшин, Н. Сёмушкин, С. Яхин, 2013, Машины для подготовки почвы и посева сельскохозяйственных культур: регулировка, настройка и эксплуатация, Казан, Издательство Казанского ГАУ, 156 с.).* 

Vezirov Ch., R. Kozlev, 2006, Technological service in agriculture, Ruse, (*Оригинално* заглавие: Везиров Ч., Р. Козлев, Технологично обслужване в земеделието, Русе, 2006).

https://bg.fuelo.net https://diana-ltd.com https://varex.bg

## FRI-303.b-1-AMT&ASVM-03

## MECHATRONIC CONTROL SYSTEM FOR GUTTER SOWING DEVICES

### Assoc. Prof. Dimitar Kehayov, PhD

Agricultural university - Plovdiv Phone: 088 689 8334 E-mail: dkechajov@au-plovdiv.bg

Assist. Prof. Ivan Zahariev, PhD

Agricultural university - Plovdiv Phone: 088 698 1638 E-mail: zaharievbgr@abv.bg

### Assist. Prof. Petya Genkova

Agricultural university - Plovdiv Phone: 089 909 1561 E-mail: petiagenkova@abv.bg

**Abstract:** In the new row drills, the drive of the sowing devices is very often mechatronic. The aim of the present study is to determine the elements of a mechatronic drive for precise setting and maintenance of the sowing rate. to achieve this goal, the transmission ratio of the drive system and the amount seeds sown in one revolution of the sowing device at different densities of the sown cereal seeds were determined. Based on these indicators, an exemplary scheme for the construction of a mechatronic system for controlling the sowing rate is proposed.

Keywords: mechatronic system, seeding rate control, sowing device.

## REFERENCES

Antonov A., N. Laryushin, 2011, Calculation of the design parameters of the lever variator of the drive of the sowing apparatus of the planter-cultivator SSV – 3.5, Niva Povolzhya, №2 (19), p.56–60; (**Оригинално заглавие**: Антонов А., Н. Ларюшин, 2011, Расчет конструктивных параметров рычажного вариатора привода высевающих аппаратов сеялки–культиватора CCB - 3,5, Нива Поволжья, №2(19), c.56–60).

Вrichagina A., V. Palvinsky, B. Orlov, 2017, to the question of dosage of rapeseed with different types of seeding apparatus, Scientific and practical journal "Vestnik IrGSHA", V.80, p.73-78; (Оригинално заглавие: Бричагина А., В. Пальвинский, Б. Орлов, 2017, К вопросу дозирования семян рапса различными типами высевающих аппаратов, Научно-практический журнал "Вестник ИрГСХА", Выпуск 80, с.73-78).

Gorobey V., O. Tarimov, 2009, Research on the stability of the operation of the coil seeding apparatus from the electric drive, Scientific notes of the Krymskogo engineering-pedagogical university, issue 20, p.80-85; (*Оригинално заглавие:* Горобей В., О. Таримов, 2009, Исследование устойчивости работы катушечного высевающего аппарата от электропривода, Ученые записки Крымского инженерно-педагогического университета, вып.20, с.80-85).

Lysyy S., 2015, Some theoretical foundations of the determination of uniform seeding of small-seeded olive crops by seeding devices, Collection of materials of the All-Russian scientific and practical conference of students, postgraduates and young scientists, vol. 2, Penza, pp. 35-36; (*Оригинално заглавие:* Лысый С., 2015, Некоторые теоретические основы определения равномерного высева мелькосеменных масличних культур высевающим аппаратам, Сборник материалов Всеруссийской научно-практической конференции студентов, аспирантов и молодых ученых, т.2, Пенза, с.35-36).

Маndradzhiev S., Hr. Bonchev, D. Kehayov, D. Zyapkov, A. Trifonov, 1991, Manual for exercises in agricultural mechanization part II - Agricultural machines, S., Zemizdat (*Оигинално заглавие*: Мандраджиев С., Хр. Бончев, Д. Кехайов, Д. Зяпков, А. Трифонов, 1991, Ръководство за упражнения по механизация на селското стопанство II част - Селскостопански машини, С., Земиздат).

Маndradzhiev S., D. Kehayov, A. Trifonov, I. Ivanov, 1993, Manual for exercises in plant protection technique, S., Zemizdat (*Оригинално заглавие:* Мандраджиев С., Д. Кехайов, А. Трифонов, И. Иванов, 1993, Ръководство за упражнения по растително-защитна техника, С., Земиздат).

Nesmiyan A., Lepeshko E., 2015, Influence of setting parameters of sowing apparatus of seed drills on seed germination, Journal of Agrarian Science Dona, 30, (*Оригинално заглавие: Несмиян А., Лепешко Е., 2015, Влияние настроечных параметров высевающих аппаратов зерновых сеялок на всхожесть семян, Вестник аграрной науки Дона, 30*).

Firsov A., V. Golubev, 2013, Analysis of constructions of sowing apparatus for the cultivation of agricultural crops, Journal of the Orenburg State Agrarian University, p.85-88; (*Оригинално заглавие:* Фирсов А., В. Голубев, 2013, Анализ конструкций высевающих аппаратов для возделывания сельскохозяйственных культур, Известия Оренбургского государственного аграрного университета, c.85-88).

Valiev A., B.Zaganshin, N.Semushkin, S.Yakhin, 2013, Machines for soil preparation and sowing of agricultural crops: regulation, adjustment and operation, Kazan, Publishing House of Kazan State Agrarian University, 156 р.; (*Оригинално заглавие: Валиев А., Б. Заганшин, Н. Сёмушкин, С. Яхин, 2013, Машины для подготовки почвы и посева сельскохозяйственных культур: регулировка, настройка и эксплуатация, Казан, Издательство Казанского ГАУ, 156 с.).* 

https://studfile.net/preview/1879260/ www.eTop.bg www.wikipedia.org

## FRI-303.b-1-AMT&ASVM-04

# PRODUCTIVE POTENTIAL AND BREEDING SUITABILITY OF HYBRID MAIZE CROSSES WITH RL61/31 PATERNAL LINE

### Assist. Prof. Lyubomir Ivanov, PhD

Institute of Agriculture and Seed Science "Obraztsov chiflik" - Ruse Phone: 089 331 7059 E-mail: nslivanov@abv.bg

### Assist. Prof. Evgeniya Zhekova, PhD

Institute of Agriculture and Seed Science "Obraztsov chiflik" - Ruse Phone: 088 422 7506 E-mail: e.d.zhekova@abv.bg

**Abstract:** Grain yield in maize occupies a decisive importance in practice. Hybrids with higher yield and shorter vegetation period are preferred by the grain producers, which makes the question of study and search of such genotypes always topical.

The objective of the study was to determine the breeding suitability of 20 experimental hybrid crosses with paternal component RL61/31 line, in terms of yield and "emergence – silk formation" period.

The study was conducted during the period 2016-2018, under conditions without irrigation, in the experimental field of IASS "Obraztsov chiflik" - Ruse. a study of 20 maize testcrosses was performed. Breeding characteristics of the crosses were made in order to improve the breeding work with them.

The summarized results showed differences in the productivity, both as by year also and between the crosses studied. The yield in the experiment ranged from 569 to 963 kg da<sup>-1</sup> (average for the period of study).

The crosses with the highest average annual yield for the period of study were:  $(LRL104 \times RL61/31) 963 \text{kg da}^{-1}$ ;  $(AA156 \times RL61/31) 959 \text{ kg da}^{-1}$ ;  $(LRL100 \times RL61/31) 917 \text{ kg da}^{-1}$ ;  $(RH301 \times RL61/31) 911 \text{ kg da}^{-1}$  and  $(LRL101 \times RL61/31) 908 \text{ kg da}^{-1}$ . The same crosses were with high genetic potential and were of interest from a breeding point in yield increasing.

The hybrids: (AB120 x RL61/31) and (AM21 x RL61/31) showed the shortest average length of "emergence–silk formation" period 58 days each, and (AM20 x RL61/31) hybrid - 56 days, and were suitable to be included in a breeding program for its reduction.

Keywords: Maize, Hybrids, Grain Yield, Emergence-Silk Formation

## REFERENCES

Angelov, K. & Glogova, L., (2010). Research of the grain yield in dependence on meteorological factors and the groups of ripeness of recognized maize hybrids. *Plant Science*, 47(6), 524-527. (*Оригинално заглавие:* Ангелов, К. & Глогова, Л., (2010).Изследване зависимостта на добива на зърно от метеорологичните условия и групата на зрялост на признати хибриди царевица. Растениевъдни науки, 47(6), 524-527.).

Angelov, K., (1994). Survey on the maize variety structure. *Plant Science*, 31(9-10), 64-66. (**Оригинално заглавие:** Ангелов, К., (1994). Проучване върху сортовата структура при царевицата. Растениевъдни науки, 31(9-10), 64-66.).

Berchev, G., (1988). Productive potentials of the regionally distributed maize hybrids. *Agriculture*, 86(1), 30-31.

Dimova, D., Petrovska, N. & Ivanov, L., (2014). Use of recurrent selection of early flowering in the late maize synthetic population. Crop Sciences, 51(2-3), 108-112. (*Оригинално заглавие:* Димова, Д., Петровска, Н., & Иванов, Л., (2010). Приложение на периодичен отбор на ранен цъфтеж в късна екзотична популация царевица. Растениевъдни науки, 47(6), 524-527.).

Ilieva, D., & Stoianova, S., (2018a). Effect of herbicides on yield and strukyural elements of exraction in hybrid Rs464 and parental components. *Proceedings of University of Ruse*, 57(1), 23-31.

Ilieva, D., & Stoianova, S., (2018b). *Study on sensitivitiy of the maize hybrid Ruse 424 and its parent forms to herbicides used against sorghum halepense*. Paper presented at the ISB-INMA TEH (International symposium), Agricultural and mechanical engineering, Bucharest, 331-336.

Ivanov, L., & Dimova, D., (2015). Breeding characteristics of topcross maize hybrids with paternal line 26A, by the methods of cluster analysis and component analysis. Agrarian Sciences, 7(17), 37-42. (**Оригинално заглавие:** Иванов, Л., & Димова, Д., (2015). Селекционна характеристика на топкрос хибриди царевица с бащина линия 26А чрез методите клъстерен анализ и анализ на компонентите. Аграрни науки, 7(17), 37-42.).

Ivanov, L., & Valchinkov, S., (2015). Breeding assessment of topcross maize hybrids with 139 96B paternal line, via the methods of cluster analysis and analysis of the components, Proceedings of the Union of Scientists - Ruse, 3(7), 43-48. (*Оригинално заглавие:* Иванов, Л., & Вълчинков, Ст., (2015). Селекционна оценка на топкрос хибриди царевица с бащина линия 139 96B, чрез методите клъстерен анализ и анализ на компонентите. Известия на Съюза на учените - Русе, 3(7), 43-48.).

Murtadha, M.A., Ariyo, O.J., & Alghamdi, S.S., (2018). Analysis of combining ability over environments in diallel crosses of maize (*Zea mays*), *Journal of the Saudi Society of Agricultural Sciences*, 17(1), 69-78.

Moradi, H., Akbari, G.A., Khavari, K.S., & Ramshini, H.A., (2012). Investigation of\_drought stress effect on morphologic traits, yield and yield components of corn (*Zea Mays* L.) new hybrids. *Int. J. Recent Sci. Res.*, 3(6), 518-529.

Petrovska, N., & Genova, I., (2010). Correlation and regression between grain yield and combinative capacity for yield and yield elements in medium-early self-pollinated maize lines. *Crop Science*, 47, 3-6.

Petrovska, N., & Valkova, V., (2014) Application of periodic selection in medium-early synthetic maize population. I. Results of the First Cycle in Synthetics "1/2003". *Plant Science*, 60(1), 71-74.

Shanin, Y., (1977). Methodology of field trial. Sofia: Bulgarian Academy of Science. (**Оригинално заглавие**: Шанин, Й. (1977). Методика на полския опит. София: Издателство на БАН).

Тотоv, N., (1997). Maize - history, distribution, achievements, perspectives. Sofia: Acad. Publ. House "Prof. M. Drinov". (*Оригинално заглавие*: Томов, Н. (1997). Царевицата – история, разпространение, постижения, перспективи. София: Академично издателство "Проф. М. Дринов").

Vulchinkov, St., & Vulchinkova, P., (2018). Breeding progress achieved of Bulgarian maize hybrids from different vegetation groups II. Grain moisture at harvest, *Journal of Mountain Agriculture on the Balkans*, 21(1), 117-127.

## FRI-303.b-1-AMT&ASVM-05

# PRODUCTIVE POTENTIAL AND BREEDING SUITABILITY OF HYBRID MAIZE CROSSES WITH RM619 PATERNAL LINE

### Assist. Prof. Lyubomir Ivanov, PhD

Institute of Agriculture and Seed Science "Obraztsov chiflik" - Ruse Phone: 089 331 7059 E-mail: nslivanov@abv.bg

### Assist. Prof. Evgeniya Zhekova, PhD

Institute of Agriculture and Seed Science "Obraztsov chiflik" - Ruse Phone: 088 422 7506 E-mail: e.d.zhekova@abv.bg

**Abstract:** Grain yield in maize occupies a decisive importance in practice. Hybrids with higher yield and shorter vegetation period are preferred by the grain producers, which makes the question of study and search of such genotypes always topical. The objective of the study was to determine the breeding suitability of 20 experimental hybrid crosses with component RM619 paternal line, in terms of the yield and the period "emergence – silk formation".

The study was conducted during the period 2016-2018, under conditions without irrigation, in the experimental field of IASS "Obraztsov Chiflik" - Ruse. a study of 20 maize testcrosses was performed. Breeding characteristics of the crosses were made in order to improve the breeding work with them.

The summarized results showed differences in the productivity, both - by year and between the crosses studied. The yield of the experiment ranged from 589 to 886 kg da<sup>-1</sup> (average for the period of study).

The crosses with he highest average annual yield for the period of study were: (AM111 x RM619) 886 kg da<sup>-1</sup>; (AA156 x RM619) 883 kg da<sup>-1</sup>; (AM21 x RM619) 875 kg da<sup>-1</sup>; (RH301 x RM619) 869 kg da<sup>-1</sup>; (LRL-2-14 x RM619) 844 kg da<sup>-1</sup> and (AB120 x RM619) 837 kg da<sup>-1</sup>. The same were with high genetic potential and were of breeding interest in increasing yield.

The hybrids: (LRL100 x RM619); (AM30 x RM619) and (AB212 x RM619) showed the shortest average length of the period "emergence–silk formation" - 60 days each, and were suitable to be included in a breeding program for its reducing.

Keywords: Maize, Hybrids, Grain yield, Emergence-Silk Formation

## REFERENCES

Angelov, K., & Vulchinkov, S., (2009). Study on some economic characteristics of maize hybrids from different vegetation groups. I. Vegetation period and moisture at harvest. *Crop Science*, 46(5), 402-407. (*Оригинално заглавие:* Ангелов, К. & Вълчинков, Ст., (2009). Проучване върху някои стопански качества на хибриди царевица от различни групи по вегетация. I. Вегетационен период и влага на прибиране. Растениевъдни науки, 46(5), 402-407.).

Ashofteh-Beiragi, M., SiahSar, B.A., Khavari, Kh. S., Golbashy, M., Mahdi, N., & Ali Zade, A., (2010). Effects of genotype by environment interactions on morphological traits, yield and yield components of new grain corn (*Zea mays* L.) varieties. *Journal of Agroecology* 2(1), 136-145.

Dimova, D., Petrovska, N. & Ivanov, L., (2014). Use of recurrent selection of early flowering in the late maize synthetic population. Crop Sciences, 51(2-3), 108-112. (*Оригинално заглавие:* Димова, Д., Петровска, Н., & Иванов, Л., (2010). Приложение на периодичен отбор на ранен цъфтеж в късна екзотична популация царевица. Растениевъдни науки, 47(6), 524-527.).

Ilieva, D., & Stoianova, S., (2018a). Effect of herbicides on yield and strukyural elements of exraction in hybrid Rs464 and parental components. *Proceedings of University of Ruse*, 57(1), 23-31.

Ilieva, D., & Stoianova, S., (2018b). *Study on sensitivitiy of the maize hybrid Ruse 424 and its parent forms to herbicides used against sorghum halepense*. Paper presented at the ISB-INMA TEH (International symposium), Agricultural and mechanical engineering, Bucharest, 331-336.

Ivanov, L., & Dimova, D., (2015). Breeding characteristics of topcross maize hybrids with paternal line 26A, by the methods of cluster analysis and component analysis. Agrarian Sciences, 7(17), 37-42. (**Оригинално заглавие:** Иванов, Л., & Димова, Д., (2015). Селекционна характеристика на топкрос хибриди царевица с бащина линия 26А чрез методите клъстерен анализ и анализ на компонентите. Аграрни науки, 7(17), 37-42.).

Ivanov, L., & Valchinkov, S., (2015). Breeding assessment of topcross maize hybrids with 139 96B paternal line, via the methods of cluster analysis and analysis of the components, Proceedings of the Union of Scientists - Ruse, 3(7), 43-48. (*Оригинално заглавие:* Иванов, Л., & Вълчинков, Ст., (2015). Селекционна оценка на топкрос хибриди царевица с бащина линия 139 96B, чрез методите клъстерен анализ и анализ на компонентите. Известия на Съюза на учените - Русе, 3(7), 43-48.).

Murtadha, M.A., Ariyo, O.J., & Alghamdi, S.S., (2018). Analysis of combining ability over environments in diallel crosses of maize (*Zea mays*), *Journal of the Saudi Society of Agricultural Sciences*, 17(1), 69-78.

Moradi, H., Akbari, G.A., Khavari, K.S., & Ramshini, H.A., (2012). Investigation of drought stress effect on morphologic traits, yield and yield components of corn (*Zea Mays* L.) new hybrids. *Int. J. Recent Sci. Res.*, 3(6), 518-529.

Petrovska, N., & Genova, I., (2010). Correlation and regression between grain yield and combinative capacity for yield and yield elements in medium-early self-pollinated maize lines. *Crop Science*, 47, 3-6.

Petrovska, N., & Valkova, V., (2014) Application of periodic selection in medium-early synthetic maize population. I. Results of the First Cycle in Synthetics "1/2003". *Plant Science*, 60(1), 71-74.

Shanin, Y., (1977). Methodology of field trial. Sofia: Bulgarian Academy of Science. (**Оригинално заглавие**: Шанин, Й. (1977). Методика на полския опит. София: Издателство на БАН).

Slavova, G., (2015). Corn production in Europe, Bulgaria and worldwide, future opportunities and trends. *Izvestia Journal of the Union of Scientists-Varna. Economic Sciences Series*, (1), 57-64.

## FRI-303.b-1-AMT&ASVM-06

# STUDY OF MOISTURE IN THE GRAIN AND PERIOD OF EMERGENCY-GERMINATION IN FIVE EARLY HYBRIDS OF CORN (ZEA MAYS L.).

### Assist. Prof. Lyubomir Ivanov, PhD

Institute of Agriculture and Seed Science "Obraztsov chiflik" - Ruse Phone: 089 331 7059 E-mail: nslivanov@abv.bg

### Assoc. Prof. Galina Dyakova, PhD

Department of Agricultural Machinery "Angel Kanchev" University of Ruse Phone: 088 466 4588 E-mail: djakovaRousse@abv.bg

**Abstract:** The low grain moisture in maize is of a significant importance due to the lowering the costs of harvesting and storage of grain production. Hybrids with reduced moisture content and short vegetation are increasingly preferred, which makes the research issue of such genotypes particularly topical. In this regard it is necessary to assess the behavior of new genotypes via obtaining information about them.

The objective of the study was grain moisture in harvesting and emerging-silking period to be determined in five maize hybrids.

During the period 2010 – 2012 at the experimental fields of IASS "Obraztsov Chiflik" - Ruse a study was conducted of five maize hybrids from the group of early ripening hybrids - FAO 300-399.

The study included the hybrids: (BG1 x 139 96B), (LRL2 x 139 96B), (LRL3 x 26A), (LRL4 x 26A), and (BG2 x 26A). The traits: grain moisture in harvesting and emerging-silking period, were examined. The variation coefficients (VC) were determined for both traits per year and average.

 $(BG1 \ x \ 139 \ 96B)$  hybrid showed the lowest grain moisture - 14,8%, and  $(BG2 \ x \ 26A)$  – the highest one,17,4%. The first hybrid is suitable to be included in crosses to reduce grain moisture. Hybrids:  $(BG1 \ x \ 139 \ 96B)$ ,  $(LRL3 \ x \ 26A)$ ,  $(LRL4 \ x \ 26A)$ , and  $(BG2 \ x \ 26A)$  showed the same average length of emerging-silking period - 56 days, and are suitable for inclusion in breeding program to reduce it. The variation of the trait emerging-silking period in studied hybrids was slight and it is suitable to be used as a trait for purposeful breeding work. Hybrids:  $(BG1 \ x \ 139 \ 96B)$ ,  $(LRL3 \ x \ 26A)$ ,  $(LRL4 \ x \ 26A)$  showed slight variation of the trait grain moisture in harvesting and can be used in breeding of stable hybrids and lines according that trait.

Keywords: Maize, Coefficient of Variation (CV), Moisture

## REFERENCES

Cavalieri, A. J., & Smith, O. S., (1985). Grain filling and field drying of a set of maize hybrids released from 1930 to 1982. *Crop Science*, 25(5), 856-860.

Cross, H. Z., (1985). a selection procedure for ear drying-rates in maize. *Euphytica*, 34(2), 409-418.

Georgiev, T. M., & Mouhtanov, I. I., (1980). Relationships among several characteristics in maize related to the kernel moisture content at harvest. *Maize Genetics Cooperation News Letter*, (54), 102-105.

Kang, M. S., & Zuber, M. S., (1987). Grain dry-down studies in corn. In *Report of annual Corn and Sorghum Research Conference (USA).* 

Kang, M.S., Colbert T.R., Zuber M.S., Horrocks R.D., (1975). *Grain moisture loss as related to dry down rates in corn*. Am. Soc.Agron. Abstr., pp. 57.

Petrovska, N., & Dimova, D., (2010). Analysis and valuation of synthetic maize populations, derived from different cycles of recurrent selection. *Plant Science*, (6), 503-507. (*Оригинално заглавие*: Петровска, Н., & Димова, Д. (2010). Анализ и оценка на синтетични популации

царевица, произлезли от различни цикли на рекурентна селекция. Растениевъдни науки, (6), 503–507).

Petrovska, N., & Dimova, D., (2012). Analysis and valuation of maize inbred lines of different maturity groups. *Agricultural Sciences*, IV(11), 125-129. (*Оригинално заглавие*: Петровска, H., & Димова, Д. (2010). Анализ и оценка на самоопрашени линии царевица от различни групи на зрялост. Аграрни науки, IV(11), 125–129).

Shanin, Y., (1977). Methodology of field trial. Sofia: Bulgarian Academy of Science. (**Оригинално заглавие**: Шанин, Й. (1977). Методика на полския опит. София: Издателство на БАН).

Troyer, A. F., & Ambrose, W. B., (1971). Plant characteristics affecting field drying rate of ear corn. *Crop Science*, 11(4), 529-531.

## FRI-303.b-1-AMT&ASVM-07

## A NEW-GENERATION PATENTED THRESHER DEVICE

Lyubomir Petrov Termointertrade LTD Phone: +359 88 595 4888 E-mail: liubomir.petrov@abv.bg

**Abstract:** a thresher device of a combine harvester operating on the principle of the friction of one rigid, continuous belt, constructed of slats mounted on toothed chains via articulated joints, against another belt of the same type. The back-and-forth friction motion is provided by eccentrics, on which sprocket wheels of the chains are mounted and are positioned at 180 degrees of one belt relative to the eccentrics of the other belt. The belt pressing force is applied by tensioners. This threshing device is positioned in the place of the feeder house in conventional-design combines. The feeder house beater, drum and concave are removed, with the device performing simultaneously transportation and threshing of the grain mass from the header to the straw walker. The higher the speed of the thresher device is, the higher performance of the combine harvester will be obtained.

Keywords: thresher device device, combine harvester operating, principle of the friction.

### FRI-1.202-1-MR-01

# INVESTIGATION OF THE MICROHARDNESS OF SLIDING SURFACES FROM RESTORATIVE COATINGS FOR BEARINGS AND SHAFTS FROM AGRICULTURAL MACHINERY

### Prof. Mitko Nikolov, DSc

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies University of Ruse "Angel Kanchev", Bulgaria Tel.: +359 82 888 458 E-mail: mnikolov@uni-ruse.bg

### Prof. Plamen Kangalov, PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies University of Ruse "Angel Kanchev", Bulgaria Tel.: +359 82 888 457 E-mail: kangalov@uni-ruse.bg

**Abstract:** The article presents the change of microhardness of vibro-welded and electrochemical coatings for bearings and shafts under liquid friction. The change in the microhardness of the roller from the restored couples with anti-friction alloys BO-30 and EO-92 have the same character, and after a short softening of the surface of the vibration arc welded roller with DUR-500, a continuous strengthening is observed until the end of the test, which is higher with EO-92. This character of change in the microhardness of the welded roll can be explained by the greater number and higher content of alloying elements, their diffusion to the surface layers and the formation of new physicochemical structures within the boundaries of individual microscopic volumes at the surface subjected to friction and wear. The dynamics of the processes of strengthening and weakening of the rubbing surface of the BO-30 and EO-92 antifriction alloys have a cyclical nature, and these processes are more clearly expressed at the entrance of the sectors. This process is characteristic of pairs operating under oxidative wear, the main type of wear for parts operating under fluid friction.

Keywords: micro hardness, agricultural machinery, bearings, shafts

## REFERENCES

Alipiev O., S. Marinov, T. Uzunov. (2018) Optimal tooth profile design of a gear shaper cutter when meshing with internal straight splines. Mechanism and Machine Theory, Vol.129, pp. 70-79, ISSN 0094-114X.

Векапа D. (2020) Optimizing the maintenance of agro-industrial equipment, Academic Publishing House University of Ruse, p. 130, ISBN 978-954-712-800-2, (*Оригинално заглавие:* Бекана Д. (2020) Оптимизиране поддържането на аграрно-индустриалната техника, Русе: Академично издателство Русенски университет, с. 150, ISBN 978-954-712-800-2).

Dimitrov, M.S. (2019) Development of repaired engines with friction modifiers, Yambol, Faculty of Engineering and Technology - Yambol at the Thracian University - Stara Zagora, p. 160, ISBN 978-619-7340-00-6. (*Оригинално заглавие:* Димитров М. (2019) Разработване на ремонтирани двигатели с модификатори на триенето, Ямбол, Факултет "Техника и технологии" - Ямбол при Тракийски университет - Стара Загора с. 160, ISBN 978-619-7340-00-6).

Delikostov T., (2020) Management of fuel combustion of internal combustion engines from agricultural and tractor equipment by maintaining the food system. Scientific Monograph. Ruse, Academic Publishing House University of Ruse, p.136, ISBN 978-954-712-799-9. (*Оригинално заглавие:* Деликостов Т. (2020) Управление разгода на гориво на ДВГ от земеделската и автотракторна техника чрез поддържане на хранителната система – научна монография. Русе: Академично издателство Русенски университет, p.136, ISBN 978-954-712-799-9).

Каngalov P. (2019) Rebuilding electrolytic alloys coatings. Scientific Monograph. Academic Publishing House University of Ruse, p. 170, ISBN 978-954-712-785-2 (*Оригинално заглавие:* Кангалов П. (2019) Възстановителни покрития от електролитни сплави – научна монография. Русе: Академично издателство Русенски университет, с. 170, ISBN 978-954-712-785-2).

Kangalov P. (2012) Statistical study of the wear of the housing and the gate of the hydraulic valve P-80, IN: Scientific works of Angel Kanchev University, Ruse, Vol 51, book. 1.1, Ruse, pp. 252-256, ISBN 1311-3321. (Оригинално заглавие: Кангалов П. (2012), Статистическо изследване износването на корпуса и шибъра на хидроразпределител P-80. В: Научни трудове на РУ-2012, том 51, с. 1.1, Русе, стр. 252-256, ISBN 1311-3321).

Каngalov P., D. Beleva, K. Dyakova-Dimitrova, (2015), Determination of the initial structural characteristics of the pair of shaft-plain bearing by tractor engines. IN: Scientific works of Angel Kanchev University, Ruse, vol. 54, book 1.1, pp. 210-216, ISSN 1311 3321. (*Оригинално заглавие:* Кангалов П., Д. Белева, К. Дякова-Димитрова, (2015) Определяне на началните структурни характеристики на двоицата вал-плъзгащ лагер от автотракторни двигатели.// Научни трудове на Русенския университет, том 54, с.1.1, стр. 210-216, ISSN 1311-3321).

Marinov S., O. Alipiev, T. Uzunov. (2019) Interference of the profiles when meshing internal straight splines with gear shapers. MATEC Web of Conferences, No 287, 01015.

Nikolov M, (2019) Rebuilding Overlaid Coatings Obtained Through Vibrating Arc Overlaying Process in an Atmosphere of Shielding Gas and its Mixtures - Scientific Monograph, Academic Publishing House University of Ruse, p. 144. ISBN 978-954-712-756-2 (Оригинално заглавие: Николов М. (2019), Възстановителни вибронаварени покрития в защитни газове и техните смеси - научна монография, Русе: Академично издателсатво "Русенски университет, p. 144, ISBN 978-954-712-756-2).

Nikolov M., P. Kangalov. (2012) Benefits from maintenance and repair in utilization of resources. IN: Mendeltech International 2012 – International Scientific Conference, No 1, Brno, ISBN 978-80-7375-625-3.

Nikolov M., I. Todorov, V. Stoyanov, J. Valchev. (2019) Determination of the Structural Characteristics of the Parts of Agricultural Machinery Subject for Repair. B: PROCEEDINGS OF UNIVERSITY OF RUSE – 2019, No v 58, b 1.1, pp. 44-48, ISSN 1311-3321.

Nikolov, M., Stoyanov, V., (2014) Utilization of Resources in the Maintenance and Repair of Machines, Ruse, Ruse University Publishing Centre, p. 95, ISBN 978-954-712-607-7, (*Оригинално заглавие:* Николов М., Стоянов В. (2014) Оползотворяване на ресурсите при поддържането и ремонта на машините, Русе, Издателски център при Русенски университет, стр. 95, ISBN 978-954-712-607-7).

Todorov, I. (2013) Influence of the amplitude of vibrations on the technological parameters of the mode during vibroarc surfacing of details from the tractor and agricultural machinery. B: Scientific works of Angel Kanchev University, Vol 52, s 1.1, Ruse, pp. 293-296, ISSN 1311 3321, (*Оригинално заглавие: Тодоров И., (2013) Влияние на амплитудата на вибрации върху* технологическите параметри на режима при вибродъгово наваряване на детайли от автотракторната и земеделска техника. В: Научни трудове на PV "Ангел Кънчев" том 52, с. 1,1, Русе, с. 293-296, ISSN 1311 3321).

Todorov I. (2019) A Research about Wear Process of Details from Belt Conveyor.// Agricultural, forest and transport machinery and technologies, Vol. VI, pp. 5-10, ISSN ISSN 2367-5888.

Valov, N., Valova, I. (2017) Drying process management laboratory with remote access. International Conference on Information Technology Based Higher Education and Training, ITHET 2017, doi:10.1109/ITHET.2017.8067800.

Valov, N., Valova, I. (2020) Home automation system with Raspberry Pi. International Conference on Energy Efficiency and Agricultural Engineering, EE and AE 2020 - Proceedings, doi:10.1109/EEAE49144.2020.92789988998.

## THE ROLE OF FRICTION IN MACHINES

#### Prof. Mitko Nikolov, DSc

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies University of Ruse "Angel Kanchev", Bulgaria Tel.: +359 82 888 458 E-mail: mnikolov@uni-ruse.bg

**Abstract:** The article presents the role of friction in machinery. The advantages and disadvantages of friction for the durability of friction pairs in machines. The types of friction in the machines, the conditions for their realization in the various mechanisms of the machines are considered. Means of reducing frictional wear in machinery are presented. Friction is necessary in our life as well as in machines. The problem of friction, wear and lubrication of machines and equipment, besides being purely technical, is also an economic problem on a national scale.

Keywords: friction, wear and tear,

#### REFERENCES

Alipiev O., S. Marinov, T. Uzunov. (2018) Optimal tooth profile design of a gear shaper cutter when meshing with internal straight splines. Mechanism and Machine Theory, Vol.129, pp. 70-79, ISSN 0094-114X.

Векапа D. (2020) Optimizing the maintenance of agro-industrial equipment, Academic Publishing House University of Ruse, p. 130, ISBN 978-954-712-800-2, (*Оригинално заглавие:* Бекана Д. (2020) Оптимизиране поддържането на аграрно-индустриалната техника, Русе: Академично издателство Русенски университет, с. 150, ISBN 978-954-712-800-2).

Dimitrov, M.S. (2019) Development of repaired engines with friction modifiers, Yambol, Faculty of Engineering and Technology - Yambol at the Thracian University - Stara Zagora, p. 160, ISBN 978-619-7340-00-6. (*Оригинално заглавие:* Димитров М. (2019) Разработване на ремонтирани двигатели с модификатори на триенето, Ямбол, Факултет "Техника и технологии" - Ямбол при Тракийски университет - Стара Загора с. 160, ISBN 978-619-7340-00-6).

Delikostov T., (2020) Management of fuel combustion of internal combustion engines from agricultural and tractor equipment by maintaining the food system. Scientific Monograph. Ruse, Academic Publishing House University of Ruse, p.136, ISBN 978-954-712-799-9. (*Оригинално заглавие:* Деликостов Т. (2020) Управление разгода на гориво на ДВГ от земеделската и автотракторна техника чрез поддържане на хранителната система – научна монография. Русе: Академично издателство Русенски университет, p.136, ISBN 978-954-712-799-9).

Каngalov P. (2019) Rebuilding electrolytic alloys coatings. Scientific Monograph. Academic Publishing House University of Ruse, p. 170, ISBN 978-954-712-785-2 (*Оригинално заглавие:* Кангалов П. (2019) Възстановителни покрития от електролитни сплави – научна монография. Русе: Академично издателство Русенски университет, с. 170, ISBN 978-954-712-785-2).

Kangalov P. (2012) Statistical study of the wear of the housing and the gate of the hydraulic valve P-80, IN: Scientific works of Angel Kanchev University, Ruse, Vol 51, book. 1.1, Ruse, pp. 252-256, ISBN 1311-3321. (Оригинално заглавие: Кангалов П. (2012), Статистическо изследване износването на корпуса и шибъра на хидроразпределител P-80. В: Научни трудове на РУ-2012, том 51, с. 1.1, Русе, стр. 252-256, ISBN 1311-3321).

Kangalov P., D. Beleva, K. Dyakova-Dimitrova, (2015), Determination of the initial structural characteristics of the pair of shaft-plain bearing by tractor engines. IN: Scientific works of Angel

Капchev University, Ruse, vol. 54, book 1.1, pp. 210-216, ISSN 1311 3321. (Оригинално заглавие: Кангалов П., Д. Белева, К. Дякова-Димитрова, (2015) Определяне на началните структурни характеристики на двоицата вал-плъзгащ лагер от автотракторни двигатели.// Научни трудове на Русенския университет, том 54, с.1.1, стр. 210-216, ISSN 1311-3321).

Marinov S., O Alipiev, T Uzunov. (2019) Interference of the profiles when meshing internal straight splines with gear shapers. MATEC Web of Conferences, No 287, 01015.

Nikolov M, (2019) Rebuilding Overlaid Coatings Obtained Through Vibrating Arc Overlaying Process in an Atmosphere of Shielding Gas and its Mixtures - Scientific Monograph, Academic Publishing House University of Ruse, p. 144. ISBN 978-954-712-756-2 (Оригинално заглавие: Николов М. (2019), Възстановителни вибронаварени покрития в защитни газове и техните смеси - научна монография, Русе: Академично издателсатво "Русенски университет, p. 144, ISBN 978-954-712-756-2).

Nikolov M., P. Kangalov. (2012) Benefits from maintenance and repair in utilization of resources. IN: Mendeltech International 2012 – International Scientific Conference, No 1, Brno, ISBN 978-80-7375-625-3.

Nikolov M., I. Todorov, V. Stoyanov, J. Valchev. (2019) Determination of the Structural Characteristics of the Parts of Agricultural Machinery Subject for Repair. B: PROCEEDINGS OF UNIVERSITY OF RUSE – 2019, No v 58, b 1.1, pp. 44-48, ISSN 1311-3321.

Nikolov, M., Stoyanov, V., (2014) Utilization of Resources in the Maintenance and Repair of Machines, Ruse, Ruse University Publishing Centre, p. 95, ISBN 978-954-712-607-7, (*Оригинално заглавие:* Николов М., Стоянов В. (2014) Оползотворяване на ресурсите при поддържането и ремонта на машините, Русе, Издателски център при Русенски университет, стр. 95, ISBN 978-954-712-607-7).

Todorov, I. (2013) Influence of the amplitude of vibrations on the technological parameters of the mode during vibroarc surfacing of details from the tractor and agricultural machinery. B: Scientific works of Angel Kanchev University, Vol 52, s 1.1, Ruse, pp. 293-296, ISSN 1311 3321, (*Оригинално заглавие: Тодоров И., (2013) Влияние на амплитудата на вибрации върху* технологическите параметри на режима при вибродъгово наваряване на детайли от автотракторната и земеделска техника. В: Научни трудове на PV "Ангел Кънчев" том 52, с. 1,1, Русе, с. 293-296, ISSN 1311 3321).

Todorov I. (2019) A Research about Wear Process of Details from Belt Conveyor.// Agricultural, forest and transport machinery and technologies, Vol. VI, pp. 5-10, ISSN ISSN 2367-5888.

Valov, N., Valova, I. (2017) Drying process management laboratory with remote access. International Conference on Information Technology Based Higher Education and Training, ITHET 2017, doi:10.1109/ITHET.2017.8067800.

Valov, N., Valova, I. (2020) Home automation system with Raspberry Pi. International Conference on Energy Efficiency and Agricultural Engineering, EE and AE 2020 - Proceedings, doi:10.1109/EEAE49144.2020.92789988998.

# **RESEARCH ON THE INTENSITY OF INCOMING AND OUTGOING REQUESTS FOR MAINTENANCE SERVICE OF MOBILE MACHINERY**

### Kaloyan Nikolaev, PhD Student

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies University of Ruse "Angel Kanchev" Tel.: + 359 82 888 701 E-mail: knikolaev@uni-ruse.bg

## Assoc. Prof. Danel Leekassa Bekana, PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies University of Ruse "Angel Kanchev" Phone: +359 82 888 701 E-mail: dbekana@uni-ruse.bg

**Abstract:** Maintenance management system has a significant impact on the organization of machinery maintenance for providing and rational use of personnel, means for performing operations and maintenance of machines, formed on the basis of rational structure of the maintenance service shops, which is a special issue and requires separate research.

An important issue in organization of maintenance is determining the optimal size of the service shops, the degree of concentration and its specialization. In this regard, the results of these study are used as input data for determining the parameters of the studied service firms for maintenance of given enterprises for the research period in order to scientifically substantiate their optimal size.

*Keywords:* maintenance, repair-servicing system, agricultural machinery, intensity of incoming flow of orders, intensity of out-going flow of orders, service parameters, service workshop, maintenance model, maintenance optimisation.

## REFERENCE

Ascher H. and Feingold H. Repairable systems reliability: modeling, inference, misconceptions and their causes. a Wiley-Interscience Publication, New York, 1984.

Bekana D. Machinery Maintenance Technology. Ruse 2019 ISBN-978-954-712-782-2

Dudushki I, Research and optimization of parameters of agricultural machinery maintenance and repair service, PhD Thesis, Rusee, 2008.

Dudushki Iv. Bekana D. 2016 DUDUSHKI Iv., D.BEKANA. Research and Optimization of Agricultural Machinery Maintenance Service.// ANNALS OF FACULTY ENGINEERING HUNEDOARA – INTERNATIONAL JOURNAL OF ENGINEERING, University Politehnica Timisoara, Faculty of Engineering Hunedoara, 5, Revolutiei, 331128, Hunedoara, ROMANIA, 2010, No Tome VIII, pp. 335-343, ISSN 1584 – 2673.

Horner, R.M.W.; M.A. El-Haram; and A.K. Munns. 1997. "Building maintenance strategy: a new management approach". Journal of Quality in Maintenance Engineering, Vol. 3 No. 4, pp. 273-280.

Höyland Arnljot and Rausand Marvin, System reliability theory. Models and statistical methods. a Wiley-Interscience Publication, NewYork, 1994.

Lam, C.T. and R.H. Yeh., Optimal Maintenance Policies for Deteriorating Systems Under Various Maintenance Strategies. *IEEE Transactions on Reliability*, 43:423–430, 1994.

Mitkov A, Minkov D., Statistical Methods for Research and Optimization of Agricultural Machinery, Part II, "Zemizdat", Sofia, 1993.

Novikov O, Petuhov C, Applied Problems of Queuing theory, Moscow, 1969.

Research Centre for economics and organization agricultural production. Department for standardization of labor in agriculture and food processing industries, Departmental standard – maintenance activates, Sofia, 1979.

Spridonov G, Agricultural Machinery Maintenance System Management Optimization (*Оригинално заглавие: Спиридонов. Г. Оптимизиране управлението на ремонтно-*обслужващата, Thesis PhD, Rusee, 1981).

Tasev G, Optimizing Machinery Maintenance System, Journal "Agricultural Machinery", № 2, 1993.

Tasev G, Stochastic Methods for Scientific Research Work, Sofia, 1995.

# RESARCH ON RAIL DEFECTS ON THE RAILWAY IN NORTHERN BULGARIA

#### **Borislav Valchev, PhD Student**

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies University of Ruse "Angel Kanchev" Tel.: + 359 82 888 701 E-mail: prostosmyrten@gmail.com

**Abstract:** this article examines the intensity of renewal of agricultural machinery over time. a comparative analysis was made for the renewal of the machines. Every year, how many new machines are brought into operation are examined.

The trends of increase in number and age are considered. An analysis and summary of the research was made. *Keywords:* intensity of renewal, agricultural machinery, maintenance, machinery sesource

### REFERENCE

Gurvich A. K., B. N. Dovnar and others, Non-destructive control of rails during their operation and repair, M., Transport – 1983 (*Оригинално заглавие:* Гурвич А. К., Б. Н. Довнар и др., Неразрушающиий контроль рельсов при их эксплоа-тации и ремонте, М., Транспорт – 1983).

Магкоv А. А., D. A. Shpagin, Ultrazvukovaya defectoskopiya relsov S. P., Ed. Education and Culture – 1999 (*Оригинално заглавие:* Марков А. А., Д. А. Шпагин, Ультразвуковая дефектоскопия рельсов С. П., Изд. Образование культура – 1999).

Маtveev A. N., IL M. Lysenko and others, Defectoscopy of rails, M., Transport – 1971 (**Оригинално заглавие:** Матвеев А. Н., ИЛ М. Лысенко и др., Дефектоскопия рельсов, М., Транспорт – 1971).

Skordev A., Mihovski M., Methods for non-destructive testing, ed. Technique - 1988 (**Оригинално заглавие:** Скордев А., Миховски М., Методи за безразрушителен контрол, изд. *Техника* – 1988).

Valchev, B., Daniel Bekana. Venceslav Temelkov, Modern approach for nondestructive testing of rail track, Proceedings University of Ruse, "Angel Kanchev" 2010, Volume 49 Book 1.1. (*Оригинално заглвие:* Съвременна тенденция за без разрушителен контрол на релсов път при ЖП транспорт, Научни трудове на Русенския университет - 2010, том 49, серия 1.1).

## RESARCH ON THE TREND OF INTENSITY OF RENEWAL OF AGRICULTURAL MACHINERY IN BULGARIA

### Ivan Ivanov, PhD Student

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies University of Ruse "Angel Kanchev" Tel.: + 359 82 888 701 E-mail: ivanov\_ivan82@abv.bg

### Assoc. Prof. Todor Nikolov Delikostov, PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies University of Ruse "Angel Kanchev" Phone: +359 82 888 701 E-mail: delikostov@uni-ruse.bg

**Abstract:** this article examines the intensity of renewal of agricultural machinery over time. a comparative analysis was made for the renewal of the machines. Every year, how many new machines are brought into operation are examined.

*The trends of increase in number and age are considered. An analysis and summary of the research was made. Keywords: intensity of renewal, agricultural machinery, maintenance, machinery sesource* 

## REFERENCE

Ascher H. and Feingold H. Repairable systems reliability: modeling, inference, misconceptions and their causes. a Wiley-Interscience Publication, New York, 1984.

Bekana D. Machinery Maintenance Technology. Ruse 2019 ISBN-978-954-712-782-2.

Beloev, Hr., T. Delikostov, I. Mitev, N. Nikolov. a Monitoring System for Preventive Diagnostics of Mobile Machines in Operating Environments, Annals of The Faculty of Engineering Hunedoara – JOURNAL OF ENGINEERING. TOME VI (year 2008). Fascicule 2 (ISSN 1584 – 2665)

C.T. Lam and R.H. Yeh., Optimal Maintenance Policies for Deteriorating Systems Under Various Maintenance Strategies. *IEEE Transactions on Reliability*, 43:423–430, 1994.

Dudushki I, Research and optimization of parameters of agricultural machinery maintenance and repair service, PhD Thesis, Rusee, 2008.

Spridonov G, Agricultural Machinery Maintenance System Management Optimization (*Оригинално заглавие:* Спиридонов. Г. Оптимизиране управлението на ремонтнообслужващата, Thesis PhD, Rusee, 1981).

Stoykova V., T. Delikostov, I. Ginkov, D. Stanchev. Analysis of Schemes for Registration of Information for System for Optimal Control of Agricultural Tractor Aggregate, Journal of the Technical University at Plovdiv "Fundamental Sciences and Applications", Vol. 13(8), 2006, BULGARIA

Tasev G, Optimizing Machinery Maintenance System, Journal "Agricultural Machinery", № 2, 1993.

Tasev G, Stochastic Methods for Scientific Research Work, Sofia, 1995.

# POSSIBILITY OF LIMITING THE LOAD CAPACITY OF ELECTRIC HOISTS

### Assoc. Prof. Toni Uzunov, PhD

Department of Repair, Reliability, Mechanisms, Machines, Logistics and Chemical Technologies "Angel Kanchev" Univesity of Ruse Phone: +359 82 888 239 E-mail: tuzunov@uni-ruse.bg

**Abstract:** The present work shows the structure and the work principle of lifting capacity restrictor. The restrictor is build in a reducer of an electric hoist's lifting mechanism and consist parallel working friction safety clutch and unidirectional roller clutch with blocking mechanism. That construction turn out when the load is bigger than the admissible, it does not decrease the real safety factor of break stopping and does not admit uncontrollable lowering of load when the load is lifted and outweigh the admissible load.

Keywords: electric hoist, lifting capacity restrictor

### REFERENCES

Nikolov M., & I. Todorov. (2016), a research about influence of overlaying speed upon electrical parameters the process during vibrating arc overlaying of worn parts of transportational and agricultural machinery in ashield of argon. In Agricultural, forest and transport machinery and technologies, No 1, Volume II, pp. 28-34, ISSN 2367-5888.

Rachev, D. (1980). Electrics hoist motors. Sofia: Technique (*Оригинално заглавие*: Рачев Д. 1980. Телферни електродвигатели. София, Техника,).

Uzunov, T. (2022). *Modeling of dynamic processes when a cone shaped electric hoist motor is established to wor*. Paper presented at the XIX International Scientific Congress Machines. Technologies. Materials, Bulgaria, Vol. 1, pp. 32-34.

Uzunov, T. (2021)<sup>a</sup>. *Investigation of the axial movement of the rotor when switching on a conical hoist electric motor*. Paper presented at the IX International Scientific Conference Technics. Technologies. Education. Safety. 07-10.06.2021, vol. 1, pp.11-13, Borovets, Bulgaria.

Uzunov, T. (2021)<sup>b</sup>. *Modeling of dynamic processes when starting a electric hoist motor*. Paper presented at the Proceedings of University of Ruse - 2021, volume 60, book 1.1., pp. 69-74.

Uzunov, T., & I. Todorov. (2021). *Theoretical investigation of the dynamic loading of a lifting mechanism*. Paper presented at the AIP Conference Proceedings Transport, Ecology - Sustainable Development EKO Varna, Vol. 2439, s. 1, pp. 020025-1–020025-6.

## **FRI-9.2-1-THPE**

## FRI-9.2-1-THPE-01

## OPERATION OF A SPECIAL SADDLE 3/3 DISTRIBUTOR BLAIN EV100 WITH ELECTROMAGNETIC CONTROL

#### Assist. Prof. Ivailo Nikolaev, PhD

Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 82 888 582 E-mail: nikolaev@uni-ruse.bg

**Abstract:** This work is a continuation of the work entitled "Concerning the Design and Control of the Hydraulic Drive of Elevators". The operation and principle of operation of the special Blain EV100 electromagnetic saddle 3/3 distributor, used in elevator technology, are described in detail.

Keywords: Seat valve, hydraulic distributor, hydraulic lift

### REFERENCES

Blain Hydraulics GmbH, n.d. *Blain EV 100*. [Online] Available at: https://blain.de/downloadall/datenblatt/gb/ev\_gb.pdf [Accessed 20 09 2022].

### FRI-9.2-1-THPE-02

# DETERMINING THE VALUES OF A CENTRIFUGAL PUMPS OPERATING PARAMETERS WHEN TRIMMING THEIR IMPELLERS

### Desislava Nikolova, PhD Student

Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 82 888 766 E-mail: dpnikolova@uni-ruse.bg

**Abstract:** In order to change the flow rate and head of the centrifugal pump, the reduction of the outer diameter D2 of the impeller (also called "trimming the impeller") is often used. by trimming the impeller, the geometric similarity of the pump is violated, since only the outer diameter of the impeller is reduced while the width of the channel impeller and the other dimensions are preserved. The dimensions of the inlet and outlet elements of the pump are also preserved. Therefore, the scientific laws used in trimming the impeller of the centrifugal pumps do not correspond with the laws for similar applications of turbo machines. In this case, in order to find a mathematical solution to the process that's being reviewed, in particular the movement of liquid in pumps, dimensional analysis can be used. It makes it possible to model physical phenomena without detailed consideration of physical equations. As a result of using the dimensional analysis, equations for calculating the flow rate, head and power of the pump in trimming the impeller, were obtained.

Keywords: centrifugal pump, cutting of the impeller, dimensional analysis

### REFERENCES

Bridgman P. (1932). Dimenesional analylisis. New Haven, Vale University press, 1932 (Оригинално заглавие: Бриджмен П. Анализ размерностей, Ижевск, НИЦ "Регулярная и хаотическая динамика", 2001, 148 стр., прев. от анг.).

Bogun V. S. (2011) Ways to increase the efficiency and resource of feed pumps for thermal power plants with power units with a capacity of  $250\div1200$  MW, St. Petersburg, 2011, abstract of PhD. (Оригинално заглавие: Богун В. С. Способы повышения экономичности и ресурса питательных насосов для тэс с энергоблоками мощностью  $250\div1200$  MBm, Санкт-Петербург – 2011, автореферат к.т.н.).

Calculation of KSB centrifugal pumps *(Оригинално заглавие*: Расчёт параметров центробежных насосов KSB). https://www.proektant.org/index.php?topic=9531.0.

Georgiev R.K., Tyanev D.S. Programmed application of the method of dimensions (*Оригинално заглавие:* Георгиев Р. К., Тянев Д. С. Програмирано приложение на метода на размерностите. http://www.tyanev.com/resources/docs/Document\_V\_7.pdf).

Gülich J. Fr. (2020) Centrifugal Pumps, Fourth Edition, Springer-Villeneuve, Switzerland, 2020, ISBN 978-3-030-14787-7.

Klimentov Kl., B. Kostov (2021). CFD modeling of the characteristics of centrifugal pumps when working with a trimmed impeller. Mechanics of Machines, 125, Year XXIX, Book I, 2021, ISSN 0861-9727 (Оригинално заглавие: Климентов Кл., Б. Костов. CFD моделиране характеристиките на центробежни помпи при работа с подрязано работно колело. Механика на машините, 125, година XXIX, книга I, 2021, ISSN 0861-9727).

Lomakin D.A., Korotkov V. V. (2017). Correction of the characteristics of centrifugal pumps due to trimming the impeller. MSTU im. N.E. Bauman, 2017 (*Оригинално заглавие:* Ломакин Д.А., Коротков В.В. Корректировка характеристик центробежных насосов за счёт подрезки рабочего колеса. МГТУ им. Н.Э. Баумана, 2017).

Nikolaev I., E. Raeva2022). Mathematical Model for Studying Volumetric Losses of a Three-Rotor Hydraulic Machine with Bilateral Lantern Meshing, Takinginto Account Internal and External Leakages. Application of Mathematics in Technical and Natural Sciences, AIP Conference Proceedings, Vol. 2522, ISSN: 0094243X, 15517616.

Plaiderer K. (1960) Blade machines for liquids and gases, M., Mashgiz, 1960, 683 (**Оригинално заглавие:** Плайдерер К. Лопаточные машины для жидкостей и газов, М., Машгиз, 1960-683, прев. от немски).

Ророv G., B. Kostov, Kl. Klimentov (2010) Regarding the characteristics of Bulgarian centrifugal pumps when cutting the impeller. Heat engineering, Book I, 2010, ISSN 1314-2550 (**Оригинално заглавие:** Попов Г., Б. Костов, Кл. Климентов. Относно характеристиките на български центробежни помпи при подрязване на работното колело. Топлотехника, Книга I, 2010, ISSN 1314-2550).

Popov G., Kl. Klimentov, B. Kostov (2020). Pipelines Designing by Using Hydraulic Criteria Equations. 9th International Conference on Thermal Equipments, Renewable Energy and Rural Development (TE-RE-RD 2020) ISSN: 00-00-00, doi:10.1051/e3sconf/202018001007.

Popov G., Kl. Klimentov, B. Kostov, R. Dimitrova (2020). Analyzing the Energy Efficiency of Fan Systems by Using the Dimensional Analysis (DA) Method Symmetry II, 12(4), 1-13, doi: 10.3390/sym12040537.

Popov, G., S. Legutko, K. Klimentov, B. Kostov (2021). Applying criteria equations in studying the energy efficiency of pump systems Energies, 2021,14, 5256, 14, 5256, 1-13, doi: 10.3390/en14175256.

Stepanov A.I. (1960) Centrifugal and axial pumps. M., Mashgiz, 1960, 463 (Оригинално заглавие: Степанов А. И. Центробежные и осевые насосы. М., Машгиз, 1960, 463, прев. от англ.).

Somchart Chantasiriwan, (2011). Energy Saving in Centrifugal Pumps by Impeller Trimming. Thammasat University, Rangsit Campus, Pathum Thani 12121, Thailand, Engineering 2011.

Zlatarev P. (1979) Turbopumps and Fans. Technique, S. 1979 (*Оригинално заглавие:* Златарев П. Турбопомпи и вентилатори. Техника, С. 1979).
### FRI-9.2-1-THPE-03

### **TYPES OF STEAM TURBINES AND THEIR CHARACTERISTICS**

### Ivan Petrov, PhD Student

Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 82 888 582 E-mail: ivpetrov@uni-ruse.bg

### Assoc. Prof. Plamen Mushakov, PhD

Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 82 888 766 E-mail: pgm@uni-ruse.bg

**Abstract:** This work examines the types of steam turbines used in modern thermal power plants. Some of their characteristics are examined and analyzed in relation to ensuring maximum energy efficiency.

Technological, system and operational shortcomings are identified, the elimination of which in the initial stage of implementation contributes to improving the technical and economic indicators and improving the operational characteristics of the equipment.

Keywords: steam turbines, energy efficiency

### REFERENCES

Blain Hydraulics GmbH, n.d. *Blain EV 100*. [Online] Available at: https://blain.de/downloadall/datenblatt/gb/ev\_gb.pdf [Accessed 20 09 2022].

### FRI-19.206-1-EC-01

# FABRICATION OF A SILICONE MATRIX FOR THE STUDY OF WOOD AND RUBBER PARTICLE COMPOSITES

#### Eng. Orlin Antonov, PhD Student

Department of Heat, Hydraulics and Environmental Engineering "Angel Kanchev" Univesity of Ruse Tel.: +359 82 888 418 E-mail: oantonov@uni-ruse.bg

#### Assist. Prof. Emil Yankov, PhD

Department of Material Science and Technology "Angel Kanchev" Univesity of Ruse Tel.: +359 82 888 418 E-mail: eyankov@uni-ruse.bg

### Assoc. Prof. Margaritka Filipova, PhD

Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 82 888 418 E-mail: mfilipova@uni-ruse.bg

#### Assoc. Prof. Ivanka Zheleva, PhD, DSc

Department of Heat, Hydraulics and Environmental Engineering "Angel Kanchev" Univesity of Ruse Tel.: +359 82 888 585 E-mail: izheleva@uni-ruse.bg

**Abstract:** According to the requirements of the European Commission, regarding the recycling of widely distributed wood waste, it is necessary that they reach 25% by 2025 and 30% by 2030. for end-of-life car tires, there is a requirement that the recycled or regenerated quantities exceed 50% of the annual quantities of tires used in Bulgaria. (DIRECTIVE (EU) 2018/851, 2018).

One possible solution to achieve these goals is to combine the beneficial properties of wood particles and rubber mills to produce composites to be used in floor and insulation coverings (tiles).

The search for more practical solutions in the work and the production of a sufficient number of tiles from composites containing wood and rubber particles for the needs of the conducted experiments require the use of matrix silicone, since the fact that when polyester matrix is used, details with correct geometry, good homogeneity, clear edges and a smooth surface cannot be obtained. The resulting tiles must have precisely defined dimensions according to the requirements of the flooring standards, be easy to work with and the results obtained must be accurate and reproducible.

Keywords: composite materials, wood particles, rubber granules, silicone matrix

### REFERENCES

Antonov O., M. Filipova, I. Zheleva. Study of wood and rubber particle composites. Setting up an experiment. PROCEEDINGS OF UNIVERSITY OF RUSE-2021, volume 60, book 1.1. pp 130-137. ISSN 1311 – 3321. (Оригинално заглавие: Антонов, О., М. Филипова, И. Желева. Изследване на композити от дървесни и каучукови частици. Постановка на експеримента. Научни трудове на Русенския университет – 2021, том 60, серия 1.1, гр. Русе, стр. 130-137. ISSN 1311 – 3321).

DIRECTIVE (EU) 2018/851 of the European Parliament and of the Council, 30 May 2018 amending Directive 2008/98 / EC on waste (*Оригинално заглавие*: Директива (EC) 2018/851 на Европейския парламент и на Съвета, 30 май 2018 година за изменение на Директива 2008/98/EO относно отпадъците).

# GOOD PEDAGOGICAL PRACTICE FOR APPLICATION OF STATISTICS IN ENVIRONMENT

#### Mariana Nikolova, PhD student,

Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 89 633 4192 E-mail: mnikolova\_70@av.bg

#### Eng. Irina Minkova, PhD student,

Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 87 849 2810 E-mail: irina\_minkova@av.bg

#### Assoc. Prof. Margaritka Filipova, PhD

Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 82 888 418 E-mail: mfilipova@uni-ruse.bg

**Abstract:** STEM (Science – Technology – Engineering – Mathematics) is a sckool education that focuses on science, technology, engineering and mathematics. STEM methodology provides an opportunity for students to take part in experiments, share their ideas and understand the connections between the subjects they study in school. Polluted air is known to be closely related to human health. Pollution with gaseous and dust particles is particularly dangerous.

Interest among the 10th grade students of PPMG "Acad. Nikola Obreshkov" in the city of Razgrad, Bulgaria brought up the topic of the state of the atmospheric air, which was developed in a STEM lesson. Using modern information technologies, the skills of gathering, processing and analyzing information the students performed excellently at the national competition "Young Talents", organized by Bulgarian Ministry of Education and Sciense. They presented projects in the field of ecology, as well as they coped with the tasks during the STEM lesson. During the lesson, we used modern methods of teaching and communication to connect with the ecology expert from RU "Angel Kanchev", Assoc. Prof Margarita Filipova, PhD who gave a talk to the students. Further we plane to continue joint activities. a good pedagogical practice is presented: realization of the interdisciplinary links ecology - statistics - information technology through the joint work of teachers from PPMG Razgrad and the University of Ruse, who demonstrated the continuity between secondary and higher education.

Keywords: STEM, Air pollutants

#### REFERENCES

https://eea.government.bg/

https://eea.government.bg/kav/reports/air/qReport/176/01# https://eea.government.bg/kav/reports/air/qReport/93/01 https://eea.government.bg/kav/reports/air/qReport/115/01 https://eea.government.bg/kav/reports/air/qReport/10/01

# STANDARDS OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF POLLUTANTS IN THE ATMOSPHERIC AIR

#### Eng. Irina Minkova, PhD student,

Department of Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 87 849 2810 E-mail: irina\_minkova@av.bg

### Mariana Nikolova, PhD student,

Department of Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 89 633 4192 E-mail: mnikolova\_70@av.bg

Abstract: The paper reviews existing Standards of maximum permissible concentrations of pollutants in the atmospheric air, according to Bulgarian and EU legislation.

Bulgaria, as a part of the European Union, complies with its legislation. In this regard, the requirements of Directive 2008/50/EU / 21 May 2008 [1] on ambient air quality and cleaner air for Europe were introduced into national Legislation by Ordinance No 12 / 15 July 2010 [2] ussued by the Ministry of Environment and Water and the Ministry of Health. This Ordinance is about standards of maximum permissible concentrations of pollutants of the atmospheric air such as sulphur dioxide, nitrogen dioxide, fine particulate matter, lead, benzene, carbon monoxide and ozoner. It was published in the State Gazette, issue 58 of 30 July 2010.

Also Ordinance No. 1 / 27.06.2005 [3] issued by the Bulgarian Ministry of the Environment and Water, the Ministry of the Economy, the Ministy of Health and the Ministry of Regional Development and Public Works is for permissible emission standards for the harmful substances (pollutants) released into the atmosphere from objects and activities with stationary sources of emissions.

All maximum permissible concentrations of the different air pollutants are presented and commented in the paper.

Keywords: Standarts, Maximum Permissible Concentrations, Air Pollutants

### REFERENCES

Directive 2008/50/EU [1] of 21 May 2008 on ambient air quality and cleaner air for Europe https://eea.government.bg/bg/legislation/air

Ordinance No 12 / 15 July 2010 https://eea.government.bg/bg/legislation/air

Ordinance No 1 of 27.06.2005 https://eea.government.bg/bg/legislation/air

# NOISE ASSESSMENT OF SERVER OPERATING IN EDUCATIONAL ENVIRONMENT

#### Assist. Prof. Nikolay Kovachev,

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

**Abstract:** The paper reviews a measurement of the noise emitted by a server working close to a room, designed for educational purposes. Noise measurements were performed using a weighting curve of the sound level meter and also measurements of the spectral distribution of the sound pressure levels. In order the measurement to be under maximum power conditions, the server was loaded to the maximum through a burn-in test. The server is located near a student study hall. Noise imissions were measured at the most vulnerable workplaces. a conclusion was made that verified the choice of a place to place the server cabinet.

Keywords: noise, server, sound pressure levels, spectral noise, A-weighting, education.

#### REFERENCES

EN ISO 3745 2012(E) Third edition. Acoustic-determination of sound power levels and sound energy lewels of noise sources using sound pressure – Precision methods for anechoic rooms and hemi anechoic room. 2012, Switzerland.

Everest, F., K. Pohlmann (2001). Master Handbook of Acoustics. Fifth Edition. New York. 640 p.

Hassall, J.R., K. Zaveri. (1988). Acoustic noise measurements, June Bruel & Kaer, Sweden.

Ising, H, W. Babisch, B. Kruppa (1991). Noise-induced endocrine effects and cardiovascular risk. Noise Health, 1. pp. 37-48.

Vaseghi, S. V. (2006). Advanced Digital Signal Processing and Noise Reduction. Third edition. John Wiley & Sons Ltd. The Atrium, Southern Gate. Chichester. England. 480 p.

# TRAINING OPPORTUNITIES FOR THE PREVENTION AND MANAGEMENT OF FOREST FIRE USING A GEOGRAPHIC INFORMATION SYSTEM

#### Assoc. Prof. Plamen Manev, PhD

Department of Department of Heat, Hydraulics and Environmental Engineering, "Angel Kanchev" University of Ruse Phone: +359 82 888 485 E-mail: pmanev@uni-ruse.bg

**Abstract:** The paper presents the training opportunities for forest/field fire prevention or the real-time management of already occurring ones with the help of a geographic information system. The functionalities of the individual modules of an innovative software product, enabling coordination and adequate joint actions of the representatives of the responsible authorities and volunteer formations, were studied. The identification, analysis and assessment of the risk of forest fires, mapping of potentially threatened areas and phases (stages) in the development of critical situations were also reviewed.

Keywords: Forest fires, Prevention and management, Geographic information systems.

### REFERENCES

Georgieva, A. Application of geographic information systems for prevention of forest fires. e-Journal Varna Free University "Chernorizets Hrabar", ISSN 1313-7514. https://ejournal.vfu.bg/pdfs/Doklad%20A.%20Georgieva.pdf (*Оригинално заглавие:* Георгиева, A. Приложение на географски информационни системи за превенция на горски пожари. е-Journal на BCV "Черноризец Храбър", ISSN 1313-7514).

Esri-Bulgaria Ltd. Manual to the user of the system. Contract № 95B00-21/15.03.2022 with the subject "Delivery and implementation of a Geographical Information System for modeling forest fires" in the implementation of activities under the project "Partnerships for overcoming disasters for a secure region", e-MS code: ROBG-427 (*Оригинално заглавие: ЕСРИ-България ООД.* Ръководство на потребителя на системата. Договор № 95B00-21/15.03.2022 г. с предмет "Доставка и внедряване на Географска информационна система за моделиране на горски пожари" в изпълнение на дейности по проект "Партньорства за преодоляване на бедствия за сигурен регион", e-MS код: ROBG-427).

Petrov, N. Geographic information systems in forestry and forestry industry. Management and sustainable development 3-4/2004(11). (*Оригинално заглавие:* Приложение на географските информационни системи в горското стопанство и горската индустрия. Управление и устойчиво развитие 3-4/2004(11)).

Stefanov, S. K. Innovative methods to support decision making for forest fires or flooding. PhD Thesis, 2021. https://www.iict.bas.bg/konkursi/2021/SStefanov/disertacia.pdf (*Оригинално* заглавие: Стефанов, С. К. Иновативни методи за подпомагане вземане на решения при горски пожари или наводнения. Дисертация за придобиване на ОНС "доктор" 2021).

### FRI-16.203-1-ID-01

# NEGATIVE ASPECTS OF THE TEXTILE AND FASHION INDUSTRY AND SOME IDEAS TO DEAL WITH THEM

#### Assoc. Prof. Sofia Anguelova, PhD

Department of Engineering Design, Technical University of Sofia Phone: 02-965 32 33 E-mail: sna@tu-sofia.bg

#### Assoc. Prof. Boryana Georgieva, PhD

Department of Engineering Design, Technical University of Sofia Phone: 02-965 32 33 E-mail: b\_georgieva@tu-sofia.bg

**Abstract:** The paper makes a review on the impact of Textile industry on the environment. Data from European Union reports on the negative impact of the fashion and textile industry on the environment, the pollution of the world's oceans and a comparison with other polluting industries are presented. Guidelines are cited to address this negative influence. Attention is drawn to the role of modern textile and fashion design in the transition to a circular economy. The connection of textiles with digitalization is indicated. Examples of good practices in the fashion and textile industry are given in the field of applying the principle of 3 Rs, which is the basis of the circular economy.

Keywords: Textile industry, Environment, Pollution, Circle economics, Sustainability, Design.

#### REFERENCES

Ceschin, F. & Gaziulusoy I. (2020). Design for Sustainability, a Multi-level Framework from Products to Socio-technical Systems. London: Routledge, ISBN: 978-1-138-31516-7.

Directive 2008/98/EC on waste, https://eur-lex.europa.eu/legalcontent/EN/TXT/HTML/?uri=CELEX:32018L0851&from=BG (Accessed on 29.09.2022).

DryDye, Dyeing/Finishing/Printing, Waterless dyeing process for DryDye fabrics, 17.08.2010, https://www.innovationintextiles.com/waterless-dyeing-process-for-drydye-fabrics/ (Accessed on 27.09.2022).

European Environment Agency, Textiles in Europe's circular economy, *https://www.* eea.europa.eu/publications/textiles-in-europes-circular-economy (Accessed on 29.09.2022).

Fuad-Luke, A. (2009). *The Eco-Design Handbook, a Complete Sourcebook for the Home and Office*, 3rd Revised edition. London: Thames&Hudson Ltd., ISBN-10: 0500288399.

Georgieva, B. (2019). Knitting as a cultural-historical value and relevance. Proceeding of VII Scientific conference with international participation "Modern technologies in the cultural and historical heritage". Sofia: Technical University of Sofia, ISSN 2367-6523, pp. 137-141 (*Оригинално заглавие:* Георгиева Б., 2019. Плетивото като културно-историческа ценност и актуалност. VII Научна конференция с международно участие "Съвременни технологии в културно-историческото наследство". Сборник доклади, Том VII. София: Издателство на TV-София, ISSN 2367-6523, стр. 137-141.).

IFixIt, Repair Your Patagonia Gear, https://www.ifixit.com/Patagonia (Accessed on 27.09.2022).

Microplastics from textiles: towards a circular economy for textiles in Europe, TH-AM-21-016-EN-N, ISBN: 978-92-9480-414-3, ISSN: 2467-3196, doi: 10.2800/863646, Briefing no.

16/2021 (https://www.eea.europa.eu/publications/microplastics-from-textiles-towards-a) (Accessed on 29.09.2022).

Mugge, R. (2007). Product attachment. Doctoral dissertation. Delft: Delft University of Technology.

New models of everyday life: Arch. Sucheva and ETIKA, 24.09.2020 (*Оригинално заглавие:* Нови модели на ежедневие: Арх. Надежда Сучева и ETIKA, 24.09.2020 https://melba.bg/blog/нови-модели-на-ежедневие-етика/) (Accessed on 27.09.2022).

Pesheva, T. (2019). Denim industry – fashion, opportunities and sound improving qualities. Bulgarian Journal for Engineering Design, Issue 40, pp. 79-85, ISSN: 1313-7530 (*Оригинално* заглавие: Пешева, Т. (2019). Дънковата индустрия – мода, замърсител, възможности за рециклиране и звукопоглъщащи качества, Българско списание за инженерно проектиране, брой 40, стр. 79-85, ISSN: 1313-7530).

Studio XO, the "fashion laboratory" adding digital light and magic to what we wear, 22.09.2014, https://www.theguardian.com/technology/2014/sep/22/-sp-wearable-technology-clothes-that-let-you-download-the-latest-look (Accessed on 29.09.2022).

Textiles and the environment: the role of design in Europe's circular economy, TH-AM-22-001-EN-N, ISBN: 978-92-9480-432-7, ISSN: 2467-3196, Briefing no. 16/2021 (https://www.eea.europa.eu/publications/textiles-and-the-environment-the/textiles-and-the-environment-the) (Accessed on 29.09.2022).

Various Pollutants Released into Environment by Textile Industry, may 2012, https://www.fibre2fashion.com/industry-article/6262/various-pollutants-released-into-environment-by-textile-industry (Accessed on 28.09.2022).

# RESEARCH ON THE QUALITIES OF KNITWEAR FOR THE PURPOSE OF AN INNOVATIVE WEARABLE DEVICE

#### Assoc. Prof. Boryana Georgieva, PhD

Department of Engineering Design, Technical University of Sofia Phone: 02-965 32 33 E-mail: b\_georgieva@tu-sofia.bg

#### Assoc. Prof. Sofia Anguelova, PhD

Department of Engineering Design, Technical University of Sofia Phone: 02-965 32 33 E-mail: sna@tu-sofia.bg

**Abstract:** This paper presents experiments with a knitwear prototypes of wearable device and more specifically the analysis of knitwear samples that were produced from yarns with different composition and structure. The analysis was carried out on the basis of a series of tests and surveys. a survey was conducted to assess parameters of the subjective user experience such as comfort, visual-aesthetic and tactile impact related to the type and composition of the material. a survey based on the well-known Likert scale is used to assess the subjective characteristics. a test has been developed for the tactile evaluation of textile knitted structures. The survey was conducted among young people in the 19-21 age group. a survey was also made to a control group of five lecturers from the engineering design specialty at TU-Sofia, who were invited to act as experts.

Keywords: Wearable, Knitwear, Knitwear properties, Subjective Evaluation, User Experience

### REFERENCES

Alesina, I. & E. Lupton (2010). *Exploring Materials: creative design for everyday objects*. New York: Princeton Architectural Press, ISBN: 978-1-56898-768-2.

Allen, I.E. & Seaman, C.A. (2007) *Likert Scales and Data Analyses*. Quality Progress, 40, 64-65.

Anguelova, S. (2019). What is this clothing?, Paper presented at the VII Scientific conference with international participation "Modern technologies in the cultural and historical heritage". Sofia: Technical University of Sofia, ISSN 2367-6523, pp. 142-146 (*Оригинално заглавие:* Ангелова С. (2019). Каква е тази дреха?, VII-ма Научна конференция с международно участие "Съвременни технологии в културно-историческото наследство". Сборник доклади, Том VII. София: Издателство на ТУ-София, ISSN 2367-6523, стр. 142-146.)

Fuad-Luke, A. (2009). *The Eco-Design Handbook, a Complete Sourcebook for the Home and Office*, 3rd Revised edition. London: Thames&Hudson Ltd., ISBN-10: 0500288399.

Georgieva, B. (2020). Evaluation of Design Products (2nd, revised edition). Sofia: Direct Services, ISBN 978-619-7671-07-0 (**Оригинално заглавие:** Георгиева Б. (2020). Оценяване на дизайнерски продукти (второ, преработено издание). София: Дайрект Сървисиз" ООД, ISBN 978-619-7671-07-0.)

Krasteva, D. & Kandzhikova, G. (2015). *Objective Evaluation of the Handle of Woven Terry Fabrics*. Journal of Textile and Apparel Technology and Management (JTATM), Volume 9, Issue 3.

Mugge, R. (2007). *Product attachment*. Doctoral dissertation. Delft: Delft University of Technology.

### PERCEPTUAL ASPECTS OF THE DESIGN PROCESS

#### Assoc. Prof. Yordan Doychinov, PhD

Department of Industreial Design, "Angel Kanchev" University of Ruse Phone: +359 88 727 3040 E-mail: doichinov@uni-ruse.bg

#### Silvia Tcheparova – PhD Student

Department of Industrial Design, University of Ruse "Angel Kanchev" Tel.: +373 88 820 2808 E-mail: scheparova@uni-ruse.bg

**Abstract:** The paper reviews the perceptual aspects of the design process from the perspective of the two dominant concepts of human perception – cognitive psychology and gestalt psychology. Although at first glance they are opposed to each other, in reality they can be said to describe different stages of the same process. It examines the ways in which knowledge of cognitive and gestalt psychology can be used to optimize the construction of visual or plastic images. Special attention is also paid to the different semantic levels at which non-verbal communication in design takes place.

Keywords: Design, Perception, Gestalt, Cognitive Psychology, Semiotics, Communication

#### REFERENCES

Bürdek, B., (2015). History, Theory and Practice of Product Design. Basel: Birkhauser Verlag.

Iandoli, L., & Zollo, J., (2022). Elegant Design. a Designer's Guide to Harnessing Aesthetics. London: Bloomsbury Publishing Plc.

Kyuchukov T. (2020). Esiah Concept. On the Road to European Academic Doctrine (FRI-ONLINE-1-QHE-15), Proceedings of University of Ruse - 2020, volume 59, book 9.1. ISSN: 1311-3321.

Marsh, L., (2020). The Practical Guide to Design Theory. E-book.

Orloev, N., Hr. Beloev, M. Iliew, Y. Vasilev, K. Uzunov. (2014) Higher education in the knowledge economy. Ruse: Primax (*Оригинално заглавие: Орлоев, Н., Хр. Белоев, М. Илиев, Й. Василев, К. Узунов. 2014 Висшето образование в икономиката на знанието. Русе: Примакс).* 

Pavlovskaya, E., (2019). Fundamentals of Design and Composition: Modern Concepts. Moskva: Yurayt. (*Оригинално заглавие: Павловская, Е., 2019. Основы дизайна и композиции: современные концепции. Москва: Юрайт*).

Vermaas, P., Kroes, P., Light, A. & Moore, S., (2008). Philosophy and Design. from Engineering to Architecture. Springler.

Whalen, J., (2019). Design for How People Think. Using Brain Science to Build Better Products. Sebastopol: O'Reilly Media.

# COMPARATIVE ANALYSIS OF THE MOST POPULAR TYPES OF CARBONISATION IN TOBACCO SMOKING PIPES

Assist. Prof. Desislav Gechev Ivanov, PhD Department of Industrial Design, "Angel Kanchev" University of Ruse Phone: 359 82 888 845 E-mail: d\_gechev@abv.bg

**Abstract:** Currently, in the smoking pipe, there are several basic methods of keeping the wood in the combustion chamber of the pipe from burning. In these methods, mixtures of substances are used, which should protect the wood from burning and at the same time be without toxic effects on the human body. Several main ingredients have been proven over time, the properties of which sometimes cause disputes and controversies among pipe smokers. The most popular non-combustible and relatively few toxic substances are: activated carbon and the ash of old pipes, which in its composition approaches carbon. The two previously mentioned solids need to be attached to the hearth of the pipe by binders that must meet the conditions: temperature resistance and non-toxicity.

Keywords: Design, Comparative Analysis, Smoking Pipe

### REFERENCES

Ivanov, D., (2016) Research and development of sophisticated and innovative technical, ergonomic and aesthetic solutions in the design of smoking pipes, leading to reduced health risks RU-2016 (**Оригинално заглавие:** Иванов, Д., 2016. Изследване и разработване на усъвършенствани и иновативни технически, ергономични и естетически решения при дизайна на лула за тютюнопушене, водещи до понижаване рисковете за здравето. PУ-2016)

Bastien, A.P., (1976). Von der Schonheit der Pfeife. Wilhelm Heyne Verlag, Munchen.

Kolev, K., (2001). The Pipe, "Colins-5-2001" (*Оригинално заглавие:* Колев, К., 2001. Лулата, ИК "Колинс-5").

# SPEAKING AND COMMUNICATION IN PUBLIC LIFE. SOCIO-LINGUISTIC ANALYSIS OF COMMUNICATION – PART 2

### Assoc. Prof. Milen Minchev

Department of Industrial Design "Angel Kanchev" University of Ruse Phone: +359 88 755 0494 E-mail: mminkov@uni-ruse.bg

**Abstract:** The paper reviews the second part of the following philosophical realities: the political class - media, prominent intellectuals - media, experts in economics media, "ordinary" people - media. Foreshortenings of the impact of this type of communication on the aesthetic taste and aesthetic education of children, pupils, students and young people in general in Bulgaria.

Keywords: Philosophical Realities, Media, Aesthetic Deucation

### COMMUNICATION AS A BASIC TOOL IN DESIGN PROCESSES

#### Silvia Tcheparova – PhD Student

Department of Industrial Design, University of Ruse "Angel Kanchev" Tel.: +373 88 820 2808 E-mail: scheparova@uni-ruse.bg

### Assoc. Prof. Yordan Doychinov, PhD

Department of Industrial Design, "Angel Kanchev" Univesity of Ruse Phone: +359 88 727 3040 E-mail: doichinov@uni-ruse.bg

**Abstract:** This article provides an overview of the skills, technologies and software knowledge required by modern design processes. It follows their evolution and change over the recent years. The different phases in the design process are covered in great detail, with an emphasis on the communication methods and their importance for the development of successful design practices. The article also explores the need for introducing educational methodologies for design thinking, design leadership, design management and communication methods.

**Keywords:** Design Processes, Design Thinking, Design Leadership, Design Communication, Design Management, Design Education.

### REFERENCES

Cooper, R., Junginger, S., Lockwood, T. (2017). The Handbook of Design Management. London: Bloomsbury Academic.

Dobrevski, D., (2019) The Design up Close. Sofia: Colour Group Bulgaria (*Оригинално* заглавие: Добревски, Д., 2019. Дизайнът отблизо. София: Група Цвят - България).

Eynon, J., (2013). The Design Managers Handbook. CIOB (Chartered Institute of Building)

Hands, D., (2002). Design Management Case Studies. London: Routledge.

Markova, M., (2010). Design Management. Sofia: UNSS (*Оригинално заглавие:* Маркова, М., 2010. Дизайн мениджмънт. София: ИК на УНСС).

Sinclair, D., (2019) Lead Designers Handbook The Lead Designer and Design Management. London: RIIBA Publishing.

Woolery, E., DesignThinking Handbook. DesignBetter .Co, by InVision.

# THE FUTURE OF HIGHER EDUCATION THROUGH A UNIVERSITY FOR "ONE PERSON"

#### Assist.Prof. Kamen Uzunov, PhD

Department of Industrial Design, University of Ruse "Angel Kanchev" Tel.: +373 22 319129 E-mail: kamenuzunov@uni-ruse.bg

#### Assoc. Prof. Yordan Doychinov, PhD

Department of Industrial Design, University of Ruse "Angel Kanchev" Phone: 086-821 521 E-mail: doichinov@uni-ruse.bg

**Abstract:** Transformation (Why and how?) of the University of Ruse into a University for "one person" with a teacher-MENTOR. University for you! Regardless of whether you are a student or a teacher!

1. Transformation is a creative act of profound fundamental and essential change to adapt and survive in a complex, dynamically changing and unpredictable environment of evolution, time, progress and future.

2. Transformation cannot be accomplished only with traditional moves, measures and decisions - without purposeful fundamental changes, continuous changes and innovations.

3. Transformation is not a one-act procedure, but a permanent, multi-stage and multi-step process of mindboggling changes, taking into account factors such as indeterminacy and unpredictability in dynamic real conditions of non-linearity, disorder, chaos, entropy, fragility and vulnerability - price of survival!

Main entities in the transformation: the University (the present one) of the passing industrial age; the teacher - distanced from his student or mentor; the student - unique, unparalleled subject of Generation Y!

The teacher-MENTOR teaches on behalf of knowledge in the current or coming era and brings with him to the academic scene his predecessors, teacher and colleagues (personally known and unknown), teaching on behalf of all scientists - with the works, theories, hypotheses, achievements and their offerings.

And let us not be afraid: Difficult things become reality after twenty years! "The impossible" - after fifty *Keywords:* Efficiency, Effectiveness, GPS, Seismic Protection Methods, Model

#### REFERENCES

Beloev, H., N. Orloev, K. Uzunov, J. Doichinov. (2012). Creartivity and Innovation in Interdisciplinary Areas of Klowledge. Information Design as Highly Intellectual Technology. Paper presented at the 9-International congress MTM No4, 84-85.

Orloev N., H. Beloev, M. Iliev, Y. Vassilev, K. Uzunov, P. Boneva, (2015). The Preentrepreneurship – a New Gate to the Enterprise. Paper presented at the INTED2015. Proceedings Publisher: IATED Academypp. 2015, Madrid, Spain.

Orloev N., H. Beloev, M. Iliev, Y. Vassilev, K. Uzunov, P. Boneva. (2015). Higher Education in the Economy of Knowledge. Paper presented at the INTED2015 Proceedings Publisher: IATED Academypp. 2015, Madrid, Spain.

Orloev, N., Hr. Beloev, M. Iliew, K. Uzunov. (2014). Training at the University of Ruse in an optional specialization in "Technology of creativity and innovation". Paper presented at the Proceeding of University of Ruse - 2014, volume 53, book 1.2. (*Оригинално заглавие: Орлоев H., X. Белоев, М. Илиев, К. Узунов, Обучение в Русенски университет по факултативна специализация по "Технология на креативността и иновациите", В:НАУЧНИ ТРУДОВЕ* том 53, серия 1.2, Издател:Научна конференция на РУ&СУСтр.416-419).

Orloev, N., Hr. Beloev, M. Iliew, Y. Vasilev, K. Uzunov. (2014) Higher education in the knowledge economy. Ruse: Primax (*Оригинално заглавие: Орлоев Н., Х. Белоев, М. Илиев, Й. Василев, К. Узунов. 2014 Висшето образование в икономиката на знанието. Русе: Примакс).* 

Orloev, N., K. Uzunov, Y. Vassilev. (2013). Knowledge based on creative-innovative learning in "University for one person". Paper presented at the Opportunities to Create an Innovation Union in the Danube Area, Publisher: European Night of Scientists (*Оригинално заглавие:* Орлоев H., K. Узунов, Й. Василев. 2013 Знание, базирано върху креативно-иновационното обучение в "Университет за един човек". Публикувано в Възможности за създаване на съюз на иновациите в Дунавското пространство, Издател:Европейска нощ на учените, Стр.9, Русе).

Orloev, N., K. Uzunov. (2008). Design of design in the "knowledge economy". Sofia: Biennale of Bulgarian Design (*Оригинално заглавие: Орлоев, Н., К. Узунов, 2008. Дизайн на дизайна в "икономиката на знанието". София: Биенале на българския дизайн)*.

Uzunov, K. (2014) Computer and serious games - essence and application. a place for serious games in education. Paper presented at the Proceeding of University of Ruse - 2014, volume 53, book 1.2. (*Оригинално заглавие:* Узунов К., Компютърни и сериозни игри – същност и приложение. Място на сериозните игри в образованието, В:НАУЧНИ ТРУДОВЕ том 53, серия 1.2. Издател:Научна конференция на РУ&СУСтр.431-435).

# EVOLUTION OF THE AUTOMOTIVE LIGHTING SCULPTURE CONCEPT

Assoc. Prof. Teodor Kyuchukov, PhD Department of Industrial Design, "Angel Kanchev" University of Ruse Phone: +359 88 748 6219 E-mail: tkyuchukov@uni-ruse.bg

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

The Automotive Lighting Sculpture concept introduces the idea of "elegant light-based metacommunication" as an alternative to the interaction between road lighting and automotive lighting. It represents the image of a metamobile (metamob) as a hypothetical successor to present vehicles, with the emergence of intelligent lighting of a new generation - the so-called "engaged light" and respectively "light-based semantic field".

The question that arises today is when the average citizen and lighting industry representatives will define the existence of light pollution and visual glare as a harm rather than a benefit. Visual culture is e by educated by creating an adequate lighting environment. Several international campaigns dedicated to the use of artificial light are essential because they awaken and direct public attention and awareness to the problem of light pollution and its effects. The benefit of these campaigns is not in their demonstrativeness, but in the lack of an adequate energy and environmental culture to match modern high-tech progress. a rethinking of artificial light is needed, the understanding of lighting hygiene, especially when it is overdosed and unsatisfactorily managed.

**Keywords:** Automotive Lighting Sculpture, Automotive Lighting, Evolution, Exterior Lighting, Metamob, Elegant Light-based Metacommunication, Engaged Light, Light-based Semantic Field.

#### REFERENCES

Beloev H., Pencheva V., R. Kyuchukov (2018). The internalization in the national quality system of higher education. 57th Science Conference of Ruse University, 2018; Proceedings of University of Ruse, Quality Assurance in Higher Education Bulgaria, volume 57, book 9, FRI-K1-1-QHE-01 (*Оригинално заглавие:* Белоев Х. Пенчева В., Кючуков Р. Интернационализация в националната система за качество на висшето образование, 2018 г., том 57, серия 9 "Качество ан висшето образование", FRI-K1-1-QHE-01).

Doychinov, Y (2020). Research of Contemporary Presentation Technologies and the Possibilities for their Adaptation to Academic Activities. PROCEEDINGS OF UNIVERSITY OF RUSE - 2020, FRI-ONLINE-1-ID-01, volume 59, book 1.1.

Kyuchukov T. (2019). Light Pollution. "Borders" of Lighting Design / Светлинно замърсяване и "Граници" на дизайна на осветлението BalkanLight Junior 2019. Second Balkan Junior Conference on Lighting, Plovdiv, Bulgaria, 19-21 september 2019 BalkanLight Junior 2019 is technically Co. Sponsored by IEEE (#45311), ISSN: 2603-414X

Kyuchukov T. (2020). Academic Doctrine of Light. Esiah Concept (FRI-ONLINE-1-ID-04) Proceedings of University of Ruse - 2020, volume 59, book 1.1.ISSN: 1311-3321.

Kyuchukov T. (2020). Esiah Concept. On the Road to European Academic Doctrine (FRI-ONLINE-1-QHE-15), Proceedings of University of Ruse - 2020, volume 59, book 9.1. ISSN: 1311-3321.

Kyuchukov T. (2020). Light Pollution. Light and Energy Culture of Lighting and Lighting Design (FRI-ONLINE-1-ID-05), Proceedings of University of Ruse - 2020, volume 59, book 1.1. ISSN: 1311-3321.

Kyuchukov T. (2020). Vivals Periphery (e-book), ISBN: 978-619-207-194-3.

Pencheva V., H. Beloev, M. Fartunova, R. Kyuchukov (2017). New Educational Platforms in Higher Education. 56th Science Conference of Ruse University, 2017; Proceedings of University of Ruse, Quality Assurance in Higher Education Bulgaria, volume 56, book 9, p.p. 9-15, SAT-K1-1-QAHE-01 (*Оригинално заглавие:* Пенчева В., Белоев Х., М. Фъртунова М., Кючуков Р. Нови образователни платформи във висшето образование, 2017 г., том 56, серия 9 "Качество на висшето образование", стр. 9-15, SAT-K1-1-QAHE-01).

Стратегия за развитие на висшето образование в Република България 2021-2030г. Приета с Решение на 44-то Народно събрание от 17 декември 2020 г. Обн. в Държавен вестник, брой 2 от 8 януари 2021 г. https://www.mon.bg/bg/143.

# ERGONOMICS AND DESIGN FOR OCCUPATIONAL THERAPI PRACTICE

Assoc. Prof. Cvetomir Konov, Department of Industrial Design, University of Ruse"Angel Kanchev" Phone: +359 82 888 558 E-mail: cdkonov@uni-ruse.bg

**Abstract:** In 2006, at the University of Ruse "Angel Kanchev", for the first time in Bulgaria, training in the specialty "Ergotherapy" began on a regular basis. The need for such training is the increased number of people for whom medical-therapeutic services have to be applied as a final stage of their rehabilitation. It is a form of healthcare for the suffering and a manifestation of humanity in modern society.

The discipline "Ergonomics and design for occupational therapy practice" is included in the compiled curriculum of the specialty, possessing innovative potential and with the necessary foresight. Its content is designed with the opportunity for students to acquire basic knowledge and practical skills in ergonomics, design and capacity for independent synthesis and materialization of simple aids needed in daily occupational therapy practice. An activity inextricably linked to the creation of a favorable and aesthetic work and living environment for people with disabilities, for therapeutic needs, in which the influence of all measurable parameters from the "Human-Machine-Environment" system is taken into account.

Training in the discipline enables students to get closer to the specifics of design work and ways to carry out constructive communication with designers and constructors. to formulate and solve problems by mastering the methods and means of synthesis of ergonomic and design solutions of simple aids for people with disabilities and familiarization with the ways of their materialization within the framework of "Man-Machine-Environment" systems, the saturation of the same with components and their optimization.

**Key words:** occupational therapy, disabilities and deviations, rehabilitation, creativity, skills, equality, restoration of quality of life and design of adapted devices.

#### REFERENCES

Konov C., Lectures on the discipline " Ergonomics and design for occupational therapy practice ", University of Ruse "Angel Kanchev". (**Оригинално заглавие:** Конов, Цв., Лекции по дисциплината "Ергономия и дизайн за ерготерапевтичната практика", Русенски университет "Ангел Кънчев").

Internet: - Wikipedia;

### FRI-1.317-1-MEMBT-01

# RESEARCH ON LEAK RATE OF EXPANDED PTFE FLAT GASKET WITH LOCALLY INCREASED DENSITY

### Evlogi Mladenov, PhD Student

Department of Materials Science & Technology, "Angel Kanchev" University of Ruse, Bulgaria E-mail: emladenov@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

#### Assoc. Prof. Rossen Radev, PhD

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

Abstract: Because of the increasingly high requirements for sealing elements, their manufacturers continue to look for new designs and solutions using existing materials. The goal is to cover the current standards for reducing emissions into the atmosphere, losses of raw materials and expanding their application. This article examines expanded polytetrafluoroethylene (ePTFE) flat gaskets used in the industry to seal flange connections that prevent mixing and leakage of fluids into the environment with their advantages and disadvantages. a review of test equipment, which measures the amount of test gas passed through the gasket per unit of time, which is one of the main operating characteristics of the gasket according to regulatory documents. Existing ePTFE seals from various manufacturers and solutions to improve tightness are reviewed. a comparison was made of the required contact stress applied to the seal during installation to achieve the same leakage rates. An annular ePTFE gasket with locally increased density is presented. Comparative tests were conducted to determine the amount of helium gas passed through the seals at a radially changing density from the inner to the outer diameter of the seal. The results of the tests carried out show an improvement in the sealing ability and indicate a reduction in the amount of passed gas with the application of a lower contact stress on the seal while increasing the density in the area of the inner diameter.

Keywords: ePTFE(expanded polytetrafluoroethylene) flat gasket, , Leak test, Leak rate

### REFERENCES

Bartonicek, J., Schaaf, M., Schoeckle, F. (2002). "On the effect of temperature on tightening characteristics of gaskets." *ASME Pressure Vessels and Piping Conference*. Vol. 19442.

Czerwinski, J., (2012). "A Collaborative Approach to Achieving a Gas-Tight Seal Using Expanded Polytetrafluorethylene (ePTFE) Gaskets in a Fiberglass-Reinforced Plastic (FRP) Lap-Joint Flanges." *Pressure Vessels and Piping Conference*. Vol. 55010. American Society of Mechanical Engineers.

Dolan, J.W., Mills D. J. (1999). Patent US5879789, Rigid sheet polytetrafluoroethylene gasket. URL: https://patents.google.com/patent/US5879789A/en.

EN13555 (2021). Flanges and their joints. *Gasket parameters and test procedures relevant to the design rules for gasketed circular flange connections.* 

European Sealing Assosiation, ESA GASKET DATABASE, URL: https://www.esadata.org/.

Huang, J., Yuan-Haun L. (2001) "Evaluation of uni-axially expanded PTFE as a gasket material for fluid sealing applications". *Materials chemistry and physics* 70.2: 197-207.

Jones C. et al., (2017), Gasket-Handbook, Fluid Sealing Assosiation and European Sealing Assosiation, URL: https://www.fluidsealing.com/wp-content/uploads/FSA-Gasket-Handbook-June-2017.pdf.

Latte, J., Coomber, D. (2014). *Industrial gaskets. In Gaskets and Gasketed Joints* (pp. 103-138). CRC Press.

Minor R.B. et al. (2002), Patent US6485809 Low stress to seal gasket, URL: https://patents.google.com/patent/US6485809.

Rice, A., Jerry W. (2019). "Comparison of EN 13555 Gasket Test Data with Predicted Leak Rates Derived from Draft PVRC Equations." *Pressure Vessels and Piping Conference*. Vol. 58936. American Society of Mechanical Engineers.

Schaaf, M., Schöckle, F., Bartonicek, J. (2003). "Gasket Characteristics in Flanged Joints (F532)."

Schaaf, M., Schoeckle, F., Bartonicek, J. (2004). "Harmonized" Gasket Testing." ASME Pressure Vessels and Piping Conference. Vol. 46733.

Staf, M., Tenkrát, D. and Hlinčík, T. (2021). Apparatus for testing He leakage through flange gaskets at elevated pressure and temperature. *Progress in Nuclear Energy*, 139, p.103831.

Tsuji, H., Yuuki T. (2008). "Application of bolted flange joint assembly guidelines HPIS Z103 TR to EPTFE sheet gasket." *ASME Pressure Vessels and Piping Conference*. Vol. 48258.

VDI 2290 Emission control (2012). Sealing constants for flange connections

# INFLUENCE OF HEAT TRANSFER COEFFICIENT ON END-QUENCH TEST SIMULATION

#### Iliyan Danev, PhD Student

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

Assoc. Prof. Rossen Radev, PhD Department of Materials Science & Technology, "Angel Kanchev" University of Ruse, Bulgaria E-mail: rradev@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 simulation of quenching is one of the modern approaches for researching the materials heat treatment processes. The correct input data for simulation are crucial, in order to obtain reliable results. It is commonly accepted that the heat transfer coefficient (HTC) is most significant factor, impacting simulation results. In the specialized literature, there are quite different values of HTC even at equal cooling conditions and a few data regarding its influence on the simulation results. The aim of this paper is to asses the influence of HTC on results obtained by end-quench test simulation. Both simulations and physical experiment have been made in this research and their results have been compared and analysed.

Keywords: Quenching simulation, end-quench test, heat transfer coefficient, cooling ability

#### REFERENCES

Hunkel, M., Lübben, Th., Hoffmann, F., Mayr, P. (2004). Using the jominy end-quench test for validation of thermo-metallurgical model parameters. J. Phys. IV France 120, 571-579.

Narazaki, M., Kogawara, M., Shiravori, A., Fuchizawa, S. (1998). Accuracy of evaluation methods for heat transfer coefficients in quenching. *Proc. of 18th Conference ASM International Heat Treating Society*, Rosement, USA, pp. 509-517.

Sugianto, A., Narazaki, M., Kogawara, M., Shirayori, A. (2007). Validity of Heat Transfer Coefficient based on Cooling Time, Cooling Rate, and Heat Flux on Jominy End Quench Test. *Materials Science and Technology (MS&T), STEEL: Recent Developments in Steel Processing.* Detroit, Michigan, September 16-20, pp. 171-180.

Trzaska, J., Sitek, W., Dobrzański, L.A. (2006). Selection method of steel grade with required hardenability. *Journal of Achievements in Materials and Manufacturing Engineering*. 17(1-2), 289-292.

Smoljan, B., Rubeša, D., Tomašić, N., Smokvina Hanza, S., Iljkić, D. (2007). An analysis of application of modified Jominy-test in simulation of cold work tool steels quenching. *Int. J. Microstructure and Materials Properties*, 2 (1), 24-34.

Narazaki, M., Kogawara, M., Shiravori, A., Fuchizawa, S. (2003). Evaluation of Heat Transfer Coefficient in Jominy End-quench Test. *Proceedings of the Fourth International Conference of Quenching and the Control of Distortion*. 23th-35th May, Beijing.

Hömberg, D. (1996). a numerical simulation of the jominy end-quench test. *Acta Materialia*. 44 (11), 4375-4385.

Sayyad Basim Qamar (2018). Manufacturability evaluation: a CFD approach for Jominy hardenability test, *Materials and Manufacturing Processes*, 33 (16), 1881-1888.

Smoljan, B., Iljkić, D., Hanza Smokvina, S., Gržinić, L., Jokić, M., & Štic, L. (2018). An Application of Jominy Test Results in Computer Simulation of Steel Quenching. *Materials Science Forum*, 941, 504–509.

Kandpal, B.C., & Gulia, A. (2011). a review on Jominy test and determination of effect of alloying elements on hardenability of steel using jominy end quench test. *International Journal of Advances in Engineering & Technology*. 1(3), 65-71.

ISO 642:1999. Steel — Hardenability test by end quenching (Jominy test)

Nunura, C.R.N., dos Santos, C.A., Spim, J.A. (2015). Numerical – Experimental correlation of microstructures, cooling rates and mechanical properties of AISI 1045 steel during the Jominy end-quench test. *Materials and Design*. 76, 230–243.

# CONSTRUCTION OF ORTHODONTIC APPLIANCES USING LAYERING TECHNOLOGIES

#### Veselina Dukova, MSc, Dr.

Department of Materials Science and Technology, "Angel Kanchev" University of Ruse Tel.: +359 82 888 315 E-mail: vdukova@uni-ruse.bg

#### Assoc. Prof. Roussi Minev, PhD

Department of Materials Science and Technology, "Angel Kanchev" University of Ruse Tel.: +359 82 888 315 E-mail: rus@uni-ruse.bg

### Sen. Lect. Emil Yankov, PhD

Department of Materials Science and Technology, "Angel Kanchev" University of Ruse Phone: +359895614247 E-mail: eyankov@uni-ruse.bg

**Abstract:** This study describes a technological method for the construction of orthodontic brackets using digital layering technologies (Cmepeonumxorpanxb) and photopolymer resigns. a comparison is made with modern conventional technologies for their production. The resulting properties of these devices have been investigated in terms of their mechanical properties and their optical characteristics, which are important for their functionality and aesthetic apearence.

Keywords: Materials in dentistry, Orthodontics

### REFERENCES

Minev, R., Minev, E., (2016). Technology for Rapid Prototyping – Basic Concepts, Quality Issues and Modern Trends, *Scripta Scientifica Medicinae Dentalis*, 2(1), 12-22

Minev, E. et al, (2015). *The RepRap Printer for Metal Casting Patternmaking – Capabilities and Application*, Proceedings VIII Int. Conf. Advanced casting technologies, MU (МИСиС), Moskow, ISBN 978-5-9903239-3-3, 300-303

Minev E. et al., (2015). The RepRap Printers for Metal Casting Pattern Making – Capabilities and Application. IN: *On Innovative Trends in Engineering and Science (SFITES)*, Kavala, Greece, Parnas Publishing House ISBN 978-954-8483-35-6, 122-127.

Ratner B. et al., (2004). *Biomaterials Science, An Introduction to Materials in Medecine*, 2nd Ed., Academic Press.

# EFFECT OF LASER MARKING ON THE MICROSTRUCTURE AND CORROSION CHARACTERISTICS OF STAINLESS STEEL

### Veselin Hristov, PhD student

Faculty Mechanical and manufacturing of Engineering "Angel Kanchev" University of Ruse Studenska 8, Ruse, Bulgaria E-mail: *vhristov@uni-ruse.bg* 

#### Sen. Lect. Mariana Ilieva, PhD

Faculty Mechanical and manufacturing of Engineering "Angel Kanchev" University of Ruse Studenska 8, Ruse, Bulgaria Phone: +359 82 888 207 E-mail: vhristov@uni-ruse.bg

### Sen. Lect. Emil Yankov, PhD

Department of Materials Science and Technology, "Angel Kanchev" University of Ruse Phone: +359895614247 E-mail: *eyankov@uni-ruse.bg* 

### Prof. Lybomir Lazov, Dr. Sc. Ing.

Faculty of Engineering Rezekne Academy of Technologies (RTA) Atbrīvošanas aleja 115, Rezekne, Latvia E-mail: *lyubomir.lazov@rta.lv* 

### Assoc. Prof. Roussi Minev, PhD

Department of Materials Science and Technology, "Angel Kanchev" University of Ruse Tel.: +359 82 888 315 E-mail: *rus@uni-ruse.bg* 

**Abstract:** The purpose of the present study is to establish a relationship between laser processing parameters and corrosion resistance on the surface of AISI 304 stainless steel treated with a nanosecond fiber laser. The behaviour of treated specimens during external polarization in a 3% NaCl water solution was analyzed; corrosion rates were calculated. Results are presented for possible interrelationships between material corrosion resistance and laser process parameters.

Keywords: Corrosion resistance, Marking, Laser

#### REFERENCES

Brygo, F. C. et.al. (2005). Laser fluence, repetition rate and pulse duration effects on paint ablation, *Applied Surface Science*, 252(6): 2131–2138. DOI: 10.1016/j.apsusc.2005.02.143

Ke L. et.al. (2009). Laser cleaning of rust on ship steel using TEA CO<sub>2</sub> pulsed laser. In *Photonics and Optoelectronics Meetings (POEM 2009) Industry Lasers and Applications*; International Society for Optics and Photonics: Bellingham, WA, USA, v. 7515, 75150G1-75150G8, DOI: 10.1117/12.846775

Laakso P, et.al. (2009). Relation of laser parameters in color marking of stainless steel, *Phys B Condens Matter*, 378–380, Corpus ID: 5544646

Dahotre, N. B. and Samant A. N., (2011), Laser Machining of Advanced Materials, CRC Press/Balkema, London, UK; Boca Raton, Fla.

G. Buchfink, (2007). The Laser as a Tool: a Light Beam Conquers Industrial Production, 1st ed. (Würzburg: Vogel Buchverlag Wurzburg).

Kaminski, D., (2011). Laser Marking. How to choose the best laser for your marking application, Laserfocusworld, http://www.laserfocusworld.com/articles/2011/04/lasermarking-how-to-choose-the-best-laser-for-your-markingapplication.html

Chen, M.-F., et.al. (2008). a scribing laser marking system using DSP controller, *Optics and Lasers in Engineering*, 46(5), 410–418.

Diaci, J. D., et.al. (2011). Rapid and flexible laser marking and engraving of tilted and curved surfaces, *Optics and Lasers in Engineering*, 49(2), 195–199.

# INFLUENCE OF THE PROCESS PARAMETERS ON THE MECHANICAL PROPERTIES OF FRICTION STIR WELDED JOINTS OF AA 5754

### Assoc. Prof. Danail Gospodinov, PhD

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

### Assist. Prof. Nikolay Ferdinandov, PhD

Department of Materials Science and Technology, "Angel Kanchev" University of Ruse, Bulgaria E-mail: *nferdinandov@uni-ruse.bg* 

### Assist. Prof. Mariana Ilieva, PhD

Department of Materials Science and Technology, "Angel Kanchev" University of Ruse, Bulgaria E-mail: mdilieva@uni-ruse.bg

### Assoc. Prof. Rossen Radev, PhD

Department of Materials Science & Technology, "Angel Kanchev" University of Ruse, Bulgaria E-mail: *rradev@uni-ruse.bg* 

Abstract: Friction Stir Welding is one of the most innovative methods developed in recent years, currently being used in aviation, automotive industry, rail transport, nuclear industry, and many others. The method is carried out in solid state and is primarily used for joining aluminium and aluminium alloys (AA 1050, 1200, 2024, 4047, 5083, 6082, 6061, 7075, 7020), but it is also possible to use it for polymers, dissimilar nonferrous metals, steels, titanium, zinc, lead, magnesium, copper, and composite materials, many of which are considered difficult to weld. The thickness of the welded parts varies from 0.5 to over 100 mm, and it is most often applied to thicknesses from 3 to 40 mm. The mixing of the material during welding and the temperature at which the process takes place are the main factors determining the possibility of obtaining welded joints with certain mechanical properties. While the shape and dimensions of the tool are mainly related to the method of mixing, the temperature depends mostly on the parameters of the mode - welding speed, tool rotation frequency, force of pressing the tool to the welded parts and tilt angle of the tool. When they are inappropriate, the defects typical of this method occur - disruption/interruption of the material flow and the formation of tunnel defects, leaks, non-fusions, melting and others, as well as reduced mechanical characteristics of the resulting compounds. The paper presents results regarding the influence of tool's pin shape and mode parameters on the process temperature and hence on the mechanical properties of friction stir welded joints of AA 5754 aluminium alloy. The influence of the shape of the pin on the appearance of defects in the work process has been established.

Keywords: Friction Stir Welding, Mechanical Properties, Aluminium Alloy AA 5754

### REFERENCES

Wahid, M., Siddiquee, A., Khan, Z., Majeed, T., & Sharma, N. (2018). Friction stir welding of AA-5754 in water and air: a comparative study. *Materials Research Express*, 6 (1), 016545.

Serio, L., Palumbo, D., Filippis, L., Galietti, U., & Ludovico, A. (2016). Effect of Friction Stir Process Parameters on the Mechanical and Thermal Behavior of 5754-H111 Aluminum Plates. *Materials*, 9(3), 122.

Vural, M., Ogur, A., Cam, G., & Ozarpa, C. (2007). On the friction stir welding of aluminium alloys EN AW 2024-0 and EN AW 5754-H22. *Archives of Materials Science and Engineering*, 28 (1), 49-54.

Chehreh, A., Grätzel, M., Bergmann, J., & Walther, F. (2020). Effect of Corrosion and Surface Finishing on Fatigue Behavior of Friction Stir Welded EN AW-5754 Aluminum Alloy Using Various Tool Configurations. *Materials*, 13(14), 3121.

Ren, D., Zeng, F., Liu, Y., Liu, L., & He, Z. (2019). Friction Stir Welding of 5754 Aluminum Alloy with Cover Sheet. *Materials*, 12(11), 1765.

Costa, M., Verdera, D., Leitão, C., & Rodrigues, D. (2015). Dissimilar friction stir lap welding of AA 5754-H22/AA 6082-T6 aluminium alloys: Influence of material properties and tool geometry on weld strength. *Materials and Design*, 87, 721–731.

Chehreh, A., Grätzel, M., Bergmann, J., & Walther, F. (2020). Fatigue Behavior of Conventional and Stationary Shoulder Friction Stir Welded EN AW-5754 Aluminum Alloy Using Load Increase Method. *Metals*, 10(11), 1510.

Filippis, L., Serio, L., Palumbo, D., Finis, R., & Galietti, U. (2017). Optimization and Characterization of the Friction Stir Welded Sheets of AA 5754-H111: Monitoring of the Quality of Joints with Thermographic Techniques. *Materials*, 10(10), 1165.

Gospodinov, D., Ferdinandov, N., Ilieva, M., & Radev, R. (2021). *Mechanical properties of Aluminium Alloy 1050 welded by Friction Stir Welding*. Proceedings of University of Ruse, 60 (2.1), 22-28.

Botila, N., Gojocaru, R., Verbitchi, V., & Ciuca, C. (2019). Friction stir processing in multiple passes of cast aluminium alloy EN AW 5083. *Welding & Material Testing*, 3, 3-7.

Botila, N., Gojocaru, R., Verbitchi, V., & Ciuca, C. (2019). Friction stir processing in multiple passes of cast aluminum alloy EN AW 4047 (AlSi12). *Welding & Material Testing*, 2, 13-17.

Sadeesh, P., Venkatesh, M., Rajkumar, V., Avinash, P., Arivazhagan, N., Devendranath, K., & Narayanan, S. (2014). Studies on friction stir welding of AA 2024 and AA 6061 dissimilar metals. *Procedia Engineering*, 75, 145 – 149.

Prashant, P., Sanjay, J., & Shree, L. (2013). a study of process parameters of Friction Stir Welded AA 6061 Aluminum Alloy. *International Journal of Innovative Research in Science*, *Engineering and Technology*, 2 (6), 2304-2309.

# DEVELOPMENT OF A TOOL FOR FRICTION STIR WELDING OF POLYMERIC MATERIALS

#### Assoc. Prof. Danail Gospodinov, PhD

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

#### Assist. Prof. Nikolay Ferdinandov, PhD Department of Materials Science & Technology, "Angel Kanchev" University of Ruse, Bulgaria E-mail: nferdinandov@uni-ruse.bg

Abstract: The use of polymer materials in the aerospace, automotive and electronic industries has been increasing in recent years due to their high specific strength, corrosion resistance and the ability to obtain parts of different shapes. Currently, more than 50 types of polymers are known, while new ones are being developed. This necessitates the need to develop methods for their processing, one of which is welding. Friction Stir Welding is one of the most innovative methods created in recent years. It is mainly used for aluminum alloys, but due to its advantages it is of serious interest also in terms of its application for welding polymeric materials. Obtaining welded joints from polymer materials with high mechanical properties and good appearance largely depends on the tool used. According to a number of researchers, tools for metallic materials are not suitable for welding polymers. for this reason, there is currently very active work on the creation of new types of tools, the most suitable at this stage being those with a hot fixed arm. The work presents a developed tool with a hot fixed arm for welding thermoplastic polymer materials. The tool makes it possible to measure the temperature in the process of work and to control the force with which it is pressed against the parts. Some results are presented on the mechanical characteristics of the polyethylene welded joints obtained with it.

Keywords: Friction stir welding, Tool with stationary shoe, Polymeric materials

#### REFERENCES

Eslamia, S., Ramosa, T., Tavaresa, P., & Moreiraa, P. (2015). Effect of friction stir welding parameters with newly developed tool for lap joint of dissimilar polymers. *Procedia Engineering*, 114, 199 – 207.

Huang, Y., Meng, X., Xie, Y., Wan, L., Lv, Z., Cao, J., & Feng, J. (2018). Friction stir welding/processing of polymers and polymer matrix composites. *Composites: Part A*, 105, 235 –257.

Eslami, S., Ramos, T., Tavares, P., & Moreira, P. (2015). Shoulder design developments for FSW lap joints of dissimilar polymers. *Journal of Manufacturing Processes*, 20, 15–23.

Eslami, S. (2019). Friction Stir Welding of Polymers: an innovative technological approach. Submitted for the degree of Doctor of Philosophy, Engineering Faculty of the University of Porto.

Simoes, F., & Rodrigues, D. (2014). Material flow and thermo-mechanical conditions during Friction Stir Welding of polymers: Literature review, experimental results and empirical analysis. *Materials and Design*, 59, 344–351.

Eslami, S., Tavares, P., & Moreira, P. (2017). Friction stir welding tooling for polymers: review and prospects. *The International Journal of Advanced Manufacturing Technology*, 85(432),1-14.

Lambiase, F., Derazkola, H., & Simchi, A. (2020). Friction Stir Welding and Friction Spot Stir Welding. *Processes of Polymers - State of the Art. Materials*, 13(10), 2291.

Nelson, T., Sorenson, C., & Johns, C. (2004). Friction stir welding of polymeric materials. US Patent 6,811,632, 2004.

Ahmadi, H., Arab, M., & Ghasemi, A. (2014). Optimization of processparameters for friction stir lap welding of carbon fibre reinforced thermo-plastic composites by Taguchi method. *J Mech Sci Technol*, 28, 279–284.

Strand, S. (2004). Effects of friction stir welding on polymer microstructure. Brigham Young University, Theses and Dissertations, 42.

Barmouz, M., Shahi, P., & Asadi, P. (2014). Friction stir welding/processing of polymeric materials. *Adv Frict Stir Weld Process*, 601–670.

Kiss, Z., & Czigány, T. (2007). Applicability of friction stir welding in polymeric materials. *Period Polytech. Mech. Eng.* 51(1), 15-18.

Scialpi, A. et al. (2009). Friction stir welding for plastics. *Welding International*, 23(11), 846-855.

Hirasawa, S. et al. (2010). Analysis of effect of tool geometry on plastic flow during friction stir spot welding using particle method. *J Mater Process Technol.*, 210(11), 1455–1463.

# VIBRATION MEASUREMENT AND ANALYSIS OF A FRICTION STIR WELDING PROCESS

#### Assistant Prof. Svetlin Stoyanov, PhD Eng.

Department of Technical mechanics, "Angel Kanchev" University of Ruse, Bulgaria E-mail: SStoyanov@Uni-Ruse.BG

### Assistant Prof. Ivo Draganov, PhD Eng.

Department of Technical mechanics, "Angel Kanchev" University of Ruse, Bulgaria E-mail: iivanov@uni-ruse.bg

**Abstract:** The paper presents a study of the vibration of a friction stir welding process. The acceleration is measured in the time area, and the spectrograms are obtained with the help of the Fast Fourier Transform algorithm. The amplitudes and frequencies of the vibration harmonics are determined. Also, the sources of this harmonics are localized.

*Keywords:* Friction Stir Welding, Vibration Measurement, Vibration Analysis, Fast Fourier Transform, Timediagrams, Spectrograms

#### REFERENCES

Abdollahzadeh, A., Bagheri, B., Abbasi, M., Sharifi, F., Mirsalehi, S., Moghaddam, A. (2021). a modified version of friction stir welding process of aluminum alloys: Analyzing the thermal treatment and wear behavior. *Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications*, 235, 2291-2309.

Bagheri, B., Rizi, A., Abbasi, M., Givi, M. (2019). Friction Stir Spot Vibration Welding: Improving the Microstructure and Mechanical Properties of Al5083 Joint. *Metallography, Microstructure, and Analysis*, 8, 713–725.

Barooni, O., Abbasi, M., Givi, M., Bagheri, B. (2017). New method to improve the microstructure and mechanical properties of joint obtained using FSW. *Int J Adv Manuf Technol*, 93, 4371–4378.

Dimitrov, D. (2021). Investigation of the Influence of Technological Parameters on Vibration Resistance in Modeling the Technological System. *Proceeding of University of Ruse*, 60, 38-45.

Ferdinandov, N., & Gospodinov, D. (2021). Tools for Friction Stir Welding: Review. *Proceeding of University of Ruse*, 60, 15-21.

Fouladi, S., Ghasemi, A., Abbasi, M., Abedini, M., Khorasani, A., Gibson, I. (2017). The Effect of Vibration during Friction Stir Welding on Corrosion Behavior, Mechanical Properties, and Machining Characteristics of Stir Zone. *Metals*, 4, 421.

Gospodinov, D., Ferdinandov, N., Ilieva, M., Radev, R. (2021). Mechanical Properties of Aluminium Alloy 1050 Welded by Friction Stir Welding. *Proceeding of University of Ruse*, 60, 22-28.

Masaki, K., Sato, Y., Meada, M., Kokawa, H. (2008). Experimental simulation of recrystallized microstructure in friction stir welding Al alloy using a plane-strain compression test. *Scripta Materialia*, 58, 355-360.

Montazerolghaem, H., Badrossamay, M., Tehrani, A. (2011). *Investigation of Vibration Assisted Friction Stir Welding and Comparison with Conventional Friction Stir Welding*. 3-rd ICME, 27-29 December 2011, Teheran. Muhammad, N., Wu, C. (2019). Ultrasonic vibration assisted friction stir welding of aluminium alloy and pure copper. *Journal of Manufacturing Processes*, 39, 114-127.

Sato, Y., Takauchi, H., Park, S., Kokawa, H. (2005). Characteristics of the kissing-bond in friction stir welded Al alloy 1050. *Materials Science and Engineering*, 405, 333-338.

Popov, M. (2020). The Influence of Vibration on Friction: a Contact-Mechanical Perspective. *Front. Mech. Eng.* 6:69, 1-8.

Popp, K. (2005). Modelling and control of friction-induced vibrations. *Mathematical and Computer Modelling of Dynamical Systems*, 11:3, 345-369.

Rahmi, M., Abbasi, M. (2017). Friction stir vibration welding process: modified version of friction stir welding process. *Int J Adv Manuf Technol*, 141–151.

Thomas, W., Nicholas, E., Needham, J., Church, M., Templesmith, P. (1991). International Patent Application No. PCT/GB92/002203 and GB Patent Application No. 9125978.9.

Vilaça, P., & Thomas, W. (2012). Friction Stir Welding Technology. *Structural Connections for Lightweight Metallic Structures*, 8, 85-124.

# EXPLICIT COUPLED EULERIAN-LAGRANGIAN SIMULATION OF FRICTION STIR WELDING

#### Assoc. Prof. Vyacheslav N. Burlayenko, PhD

Department of Applied Mathematics National Technical University "KhPI" Kharkiv, Ukraine E-mail: *viacheslav.burlaienko@khpi.edu.ua* 

### Prof. Iveliv V. Ivanov, PhD

Department of Engineering Mechanics University of Rousse Rousse, Bulgaria E-mail: *ivivanov@uni-ruse.bg* 

### Assist. Prof. Svetlana D. Dimitrova, PhD

Department of Higher Mathematics National Technical University "KhPI" Kharkiv, Ukraine E-mail: *svitlana.dimitrovaburlaienko@khpi.edu.ua* 

**Abstract:** Since the friction stir welding (FSW) process is a non-linear multi-physical phenomenon involving excessive plastic deformation, microstructural evolution due to material flow, and heat generation from friction and plasticity, the standard finite element method approach faces numerical issues and it consumes too much time and computing resources. This paper proposes a computationally efficient way to achieve robustness of the FSW simulation using a coupled Eulerian-Lagrangian (CEL) formulation in the ABAQUS environment. It is demonstrated that the CEL technique handles productively various aspects associated with the FE model such as contact, material flow, and heat generation and provides high computational efficiency with adequate accuracy. a case study is presented, to have a better understanding of the heat transfer phenomenon during the friction stir welding of dissimilar aluminum alloys.

*Keywords:* Friction Stir Welding, Coupled Eulerian-Lagrangian Technique, Coupled Thermomechanical Problem, ABAQUS/Explicit

### REFERENCES

ABAQUS (2016) User's Manual, Dassault Systèmes Simulia Corp., Providence, RI, USA.

Ahmad B., Galloway A., Toumpis A. (2018). Advanced numerical modelling of friction stir welded low alloy steel. *J. Manuf. Process.*, 34, 625–636.

Al-Badour F., Merah N., Shuaib A. and Bazoune A. (2014). Thermomechanical finite element model of friction stir welding of dissimilar alloys. *Int. J. Adv. Manuf. Technol.*, 72(5–8), 607–617.

Aziz S.B., Dewan M.W., Huggett D.J. (2016). Impact of friction stir welding (FSW) process parameters on thermal modeling and heat generation of aluminum alloy joints. *Acta Metal. Sin.*, 29, 869–883.

Benson D., (1995). a multi-material Eulerian formulation for the efficient solution of impact and penetration problems. *Comput. Mech.*, 15(6), 558-571.

Benson D.J., Okazawa S. (2004). Contact in a multi-material eulerian finite element formulation. *Comput. Methods Appl. Mech. Eng.*, 193(39–41 SPEC. ISS), 4277–4298.

Burlayenko V.N. (2016). Modelling thermal shock in functionally graded plates with finite element method. *Adv. Mater. Sci. Eng.*, 2016, 1-12.

Burlayenko V.N., Altenbach H., Dimitrova S.D. (2021). a material modelbased finite element free vibration analysis of one-, two- and threedimensional axially FGM beams. 2021 IEEE 2nd KhPI Week on Advanced Technology (KhPIWeek), 628-633.

Burlayenko V.N., Altenbach H., Sadowski T. (2019). Dynamic fracture analysis of sandwich composites with face sheet/core debond by the finite element method. In: Dynamical Processes in Generalized Continua and Structures, H. Altenbach, et al (Eds), Adv. Struct. Mater. 103. Springer, Cham, 163-194.

Burlayenko V.N., Sadowski T. (2011). Dynamic analysis of debonded sandwich plates with flexible core–Numerical aspects and simulation, In: Shell-like Structures, H. Altenbach, V. Eremeyev (Eds), Adv. Struct. Mater. 15. Springer, Berlin, Heidelberg, 415-440.

Burlayenko V.N., Sadowski T., Altenbach H., and Dimitrova S. (2019). *Threedimensional finite element modelling of free vibrations of functionally graded sandwich panels, In: Recent Developments in the Theory of Shells, H. Altenbach, et al. (Eds), Adv. Struct. Mater.* 110. Springer, Cham, 157-177.

Das D., Dey V., Bhattacharyya B. (2021). Modelling of heat flow when thermal conductivity, specific heat capacity and density all are a function of temperature. *Arab. J. Sci. Eng.*, 46, 7649–7659.

Ghiasvand A., Kazemi M., Jalilian M.M., Rashid H.A. (2020). Effects of tool offset, pin offset, and alloys position on maximum temperature in dissimilar FSW of AA6061 and AA5086, *Int. J. Mech. Mater. Eng.*, 15(6), 1-14.

Hamilton R., Mackenzie D., Li H. (2010). Multiphysics simulation of friction stir welding process. *Eng. Comput.*, 27(8), 967-985,.

Ivanov I., Velchev D., Penkova N., Krumov K., Iliev V. (2018). Stress analysis of insulating glass units under transient thermal loadings, *J. Chem. Technol. Metall.*, 53(6), 1095-1102.

Ivanov I.V. (2011). Finite element analysis and modelling of active fibre composites including damages. *Comput. Mater. Sci.*, 50(4), 1276-1282.

Ivanov I.V., Velchev D.S., Georgiev N.G. et al. (2016). a plate finite element for modelling of triplex laminated glass and comparison with other computational models. *Meccanica*, 51, 341–358.

Jain, R. et al. (2015). Friction stir welding: scope and recent development. In: Modern Manufacturing Engineering. Materials Forming, Machining and Tribology, J. Davim (Eds). Springer, Cham, 179-229.

Liu, X., Lan, S., Ni, J. (2015). Thermal mechanical modeling of the plunge stage during friction-stir welding of dissimilar Al 6061 to TRIP 780 steel. *J. Manuf. Sci. Eng.*, 137(5), 1-9.

Mandal, S., Rice, J., Elmustafa, A.A. (2008). Experimental and numerical investigation of the plunge stage in friction stir welding, *J. Mater. Process. Technol.*, 203(1–3), 411–419.

Schwer, L.E. (2009). *Aluminium plate perforation: a comparative case study using Lagrange with erosion, multi-material ALE, and Smooth Particle Hydrodynamics*, 7th European LS-DYNA Conference.

Srikanth, T., Surendran, S., Balaganesan, G., Manjunath, G. L. (2017). Response of CMT welded aluminum AA5086-H111 to AA6061-T6 plate with AA4043 filler for ballistic, *Procedia Eng.*, 194, 522–528,.

Villegas, J.F., Restrepo, R.R., Lozano, W.A.O., Durango, J.A.C., Silgado, J.U. (2020). Multiphysics coupling method to simulate the friction stir welding process. *Scientia et Technica*, 25(1), 92-96.

Yu, H., Zheng, B., Lai, X. (2018). a modeling study of welding stress induced by friction stir welding, *J. Mater. Process. Technol.*, 254, 213-220.

Zhu, Z., Wang, M., Zhang, H., Zhang, X., Yu, T., Wu, Z. (2017). a finite element model to simulate defect formation during friction stir welding. *Metals*, 7(7), 1-15.

# POSSIBILITY TO IMPLEMENT FSW PROCESSES ON CNC MACHINING CENTERS

#### Assoc. Prof. Dimitar Dimitrov, PhD

Department of Manufacturing engineering "Angel Kanchev" University of Ruse Phone: 082-888 653 E-mail: ddimitrov@uni-ruse.bg

**Abstract:** The article examines the possibility of realizing FSW - Friction Stir Welding processes on CNC machining centers. The FSW method was first proposed in 1991. Since then, it has been the subject of a number of studies, improvements and the addition of new technological applications. The text examines the design features of the most common combinations of processing centers and their technological characteristics from the point of view of their being used for releasing welding by the FSW method. The article contains an analysis and recommendations that can be a guideline for researchers and practicing engineers who would seek to implement the FSW method using available machining centers. The analysis and recommendations are made on the basis of a survey of some of the information published to date on the requirements and technological characteristics when applying FSW welding.

*Keywords:* Friction Stir Welding, Mechanical Properties, Machining centers *JEL Codes:* 

#### REFERENCES

Angelov, Yu. A. (1999) Modeling and research of the dissipative properties of joints and gears from main translations of metal-cutting machines. In: 5th International Conference AMTECH'99, Plovdiv, TU Plovdiv, 1999, pp. 116-122 (Оригинално заглавие: Ангелов, Ю. А. Моделиране и изследване на дисипативните свойства на съединения и предавки от главни преводи на металорежещи машини. В: 5-та международна конференция АМТЕСН'99, Пловдив, ТУ Пловдив, 1999, стр. 116-122)

Angelov, Yu. A. (2010) Parametric study of the vibration resistance of the main translation of a metal-cutting machine. International virtual journal for science, technics and innovations "Machines, Technologies, Materials", 2010, 4-5, 28-31, ISSN 1313-0226. (Оригинално заглавие: Ангелов, Ю. А. Параметрично изследване на виброустойчивостта на главен превод на металорежеща машина. International virtual journal for science, technics and innovations "Machines, Technologies, Materials", 2010, 4-5, 28-31, ISSN 1313-0226.)

Draganov, I., Ferdinandov, N. (2022). *Comparison of Two Numerical Models for Friction Stir Welding*. Defect and Diffusion Forum, 416, 67–75.

Ferdinandov, N., Gospodinov, D. (2021). *Tools for Friction Stir Welding: Review*. PROCEEDINGS OF UNIVERSITY OF RUSE - 2021, 60, 15-21.

Ferdinandov, N., Gospodinov, D. (2021). *Peculiarities and Application of Friction Stir Welding*. International Journal "NDT Days", 4(3), 170-177.

Gospodinov D., Ferdinandov N., Ilieva M., Radev R. (2021). *Mechanical Properties of Aluminium Alloy 1050 Welded by Friction Stir Welding*. PROCEEDINGS OF UNIVERSITY OF RUSE - 2021, 60, 22-28.

Gospodinov D., Ferdinandov N., Radev R., Ilieva M. (2022). *Research on the possibility for temperature determination during friction stir welding using mechanical properties analysis.* 11th International Scientific Conference "TechSys 2022" – ENGINEERING, TECHNOLOGIES AND SYSTEMS

Gospodinov D., Ferdinandov N. (2022). *Influence of friction stir welding modes on the mechanical properties of polyethylene joints*. International Journal "NDT Days", 5

Ferdinandov N., D. Gospodinov (2022). *Friction stir welding of polymers: features and application*. International Journal "NDT Days", 5.

Rishikesh A. G. (2019), *Friction stir welding parameters and application: a review*, Materials Today: Proceedings 19, 361–365

Mandeep S. S. (2012), *Friction Stir Welding – Process and its Variables: a Review*, International Journal of Emerging Technology and Advanced Engineering URL: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, 2(12).

Коstadinov Ch., Peeva I. (2020) *Features of queuing systems with queues, Discrete Production Automation Magazine*, 2/2020, ed. TU-Sofia, 22-25, ISSN: 2682-9584. (**Оригинално заглавие:** Костадинов Ч., Пеева И. Особености на системите за масово обслужване с опашки, сп. Автоматизация на дискретн. производство, 2/2020, изд. ТУ-София, 22-25, ISSN: 2682-9584.)

Koleva S., Enchev M., Szecsi T. (2015). *The Influence of the Mechanical Deformations on the Machining Accuracy of Complex Profiles on CNC Lathes*. MESIC Manufacturing Engineering Society International Conference 132, 521-528, ISSN 1877-7058.

Sotirov B.; Danko T.; Svetlin P.; Miroslav K. (2021). Determining the Geometrical Elements in the Photogrammetric Method for Measuring Linear Dimensions, Proceedings of the 32th DAAAM International Symposium ISBN: 978-3-902734-33-4ISSN: 1726-9679

Loukanov I., Vitliemov V. G., Ivanov I. V., Angelov Y. (2018) *Vibration steering of a vibration-driven mobile robot*, 57th Annual Science Conference of Ruse University and Union of Scientists - Ruse, NEW INDUSTRIES, DIGITAL ECONOMY, SOCIETY-PROJECTIONS OF THE FUTURE, 57(2.1), 9-17 ISBN: 2603-4123.

Stankov N., Ivanov A., Denev N., Milkov R. (2016) *Development of Technology and Devices for Assembling Six Section Crane Boom.* XIII International Scientific Congress - Summer Session, "MachinesTechnologiesMaterials", Section" Machines "and Section" Industrial Design Engineering & Ergonomics, Varna, Bulgaria, 2016, 3, 14-17, ISSN 1310-3946

# TECHNOLOGICAL ASSURANCE OF ACCURACY IN THE TURNING OF DETAILS ON CNC MACHINES

#### 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

### PhD Student Kristian Velev

Department of Technology of Machine Tools and Manufacturing, University of Ruse "Angel Kanchev" Tel.: +359 082888653 E-mail: kvelev@uni-ruse.bg

**Abstract:** Technological assurance of accuracy is a task at the stages of technological design and its management in the course of the process. The basis of the synthesis of technological solutions is the availability of reliable input information is associated with accuracy. The degree of its uncertainty is decisive for the effective implementation of the process. The paper analyzes the forms of providing this information and proposes a mathematical model for predicting turning accuracy. It allows to predict or estimate the accuracy obtained in the specific conditions, taking into account the action of the primary errors and their compensation during the process.

Keywords: Information assurance, Turning, Accuracy

### REFERENCES

Denkena B., B. Bergmann, H. Klemme (2020). Cooling of motor spindles—a review. The International Journal of Advanced Manufacturing Technology, *https://doi.org/10.1007/s00170-020-06069-0*.

Dimitrov D., T. Szecsi. (2016). Machining Accuracy on CNC Lathes under the Lack of Unity of the Process and Design Data. 48th CIRP International Conference on Manufacturing Systems, CIRP CMS 2015. p. 824-828. DOI: 10.1016/j.procir.2015.10.001.

Ji W., Shubin Yin, Lihui Wang (2019). A big data analytics based machining optimisation approach. J Intell Manuf 30, 1483–1495. https://doi.org/10.1007/s10845-018-1440-9.

Józwik J. (2018). Experimental methods of error identification in CNC machine tool operation - Monografie. Politechnika Lubelska. Lublin.

Le B., J. Khaliq, D. V, X. Teng, I. Shyha (2020). A review on NanocompositesPart 2: Micromachining. Journal of Manufacturing Science and Engineering, 142(10):1-46, DOI: 10.1115/1.4047138.

Li X., H. Wang, X. Zhu, Q. Zhou, X. Xiao, X. Wang (2016). Improvement of Precision and its Stability by Using Cooperation Motions and Enhancement of Tribological Property. 2nd International Conference on Advances in Energy, Environment and Chemical Engineering (AEECE 2016). p.0384-0387.

Ruzhentsev I.V., S.V. Lutsky, V.B. Fetkiv (2016). Discrete probabilistic information model of machining processing total error calculation. Metrologia, informacionno-izmerwatelni technologichni sistemi. UDK 658.51/52. P.135-138, Harkov. (*Оригинално заглавие: Руженцев* И.В., С.В. Луцкий, В.П. Фетькив. Дискретно вероятностные информационные модели расчета сумарной погрешности механообработки. Метрологія, інформаційно-вимірювальні технології та системи, УДК 658.51/52. 135-138. Харьков.)

Тиgengold А.К. (2011). Processing accuracy control using capabilities of machine tool knowledge system. Vestnik DGTU, t.11. N8 (59), izd.1, UDK 004.89+621.518.2 p.1201-p.1209. Rostov na Don. (*Оригинално заглавие:* Тугенгольд А.К. Управление точностью обработки с использованием возможностей системы знаний станка. Вестник ДГТУ. 2011. Т. 11, № 8(59), вып. 1. УДК 004.89+621.518.2. стр. 1201-1209, Ростов на Дон)
## FRI-10.326-1-EEEA-01

# AN INVESTIGATION OF SOME CHARACTERISTICS OF THE POWER QUALITY OF POWER SUPPLY OF AN INDUSTRIAL INDUCTION FURNACE

#### Assoc. Prof. Konstantin Koev, PhD

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

### Assist. Svetlozar Grigorov, M.Sc.Eng. - PhD Student

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

**Abstract:** The paper analyses some characteristics of electric current of power supply of a metal melting electric inductance furnace. The measurements of some of electric quantities have been made in the second of the furnace transformer and outside of the power electronic converter. The measurements were realized and results were recorded by three-phase power quality analyser MI 2885 Master Q4. The results are presented graphically and the changes in the electric current are analysed. The conclusions of experimental results can to use for development of technical solutions to improve the power quality of the power supply of the investigated induction furnace.

*Keywords:* metals melting electric inductance furnace, electric current, power quality. *JEL Codes:* L60

## REFERENCES

BDS EN 50160:2010/A3:2020 Voltage characteristics of electricity supplied by public electricity networks. (Оригинално заглавие: БДС EN 50160:2010/A3:2020. Характеристики на напрежението на електрическата енергия, доставяна от обществените разпределителни електрически мрежи).

Belgaum Foundry Cluster, Best Operating Practices (2017), a GEF-UNIDO-BEE Project, Promoting Energy Efficiency and Renewable Energy in Selected MSME Clusters in India, Ministry of New and Renewable Energy, Bureau of Energy Efficiency, MICRO, SMALL & MEDIUM ENTERPRISES, https://beeindia.gov.in/sites/default/files/BOP-Belgaum.pdf.

Gönen, T. (2014) Electric Power Distribution Engineering. 3rd Edition, CRC Press, Boca Raton.

Iagar, A., G. N. Popa, C. M. Dinis (2009). Assessment of Power Quality for Line Frequency Coreless Induction Furnaces. WSEAS TRANSACTIONS on CIRCUITS and SYSTEMS, Issue 1, Volume 8, January, ISSN: 1109-2734.

Rajalakshmi, D., R.Kavitha, K.Premalatha (2019). Harmonic Research and Mitigation Techniques in Induction Furnace. International Journal of Engineering and Advanced Technology (IJEAT), Volume-8 Issue-6S, August 2019, ISSN: 2249 – 8958.

Stefanov, St., V. Ruseva (2010). Electric power supply. University of Ruse "Angel Kanchev" press, Ruse. (*Оригинално заглавие*: Стефанов, Ст., В. Русева (2010). Електроснабдяване. Русенски университет "Ангел Кънчев", Университетско издателство Русе).

Grigorov, Sv., K. Koev (2021). Investigation the electrical power quality of a metals melting electric induction furnace. 60<sup>th</sup> Science Conference of Ruse University - Ruse. volume 60, Best Papers, ISBN: 978-954-712-864-4. (*Оригинално заглавие*: Св. Григоров, К. Коев (2021). Изследване качеството на електрическата енергия на електрическа индукционна пещ за топене на метали. 60-та научна конференция на Русенския университет "Ангел Кънчев", отличени доклади, ISBN: 978-954-712-864-4).

Grigorov, Sv., K. Koev (2022). Investigation on some electrical power quality indices of a metals melting electric induction furnace. Proceedings  $61^{st}$  Science Conference of Ruse University – SSS Ruse, volume 61, book 11.4, ISSN: 1311-3321). (**Оригинално заглавие**: Св. Григоров, К. Коев (2022). Изследване на някои показатели на качеството на електрическата енергия на електрическа индукционна пещ за топене на метали. Сборник доклади на 61-а научна конференция на Русенския университет "Ангел Кънчев" - Студентска научна сесия, Том 61, серия 11.4, ISSN: 1311-3321).

Grigorov, Sv., K. Koev (2022). An investigation of the electric voltage quality of power supply of an industrial induction furnace. Proceedings 61<sup>st</sup> Science Conference of Ruse University –Ruse, volume 61, book 11.1, ISSN: 1311-3321). (**Оригинално заглавие**: Св. Григоров, К. Коев (2022). Изследване на качеството на електрическото напрежение в захранващата мрежа на индустриална индукционна пещ. 61-а научна конференция на Русенския университет "Ангел Кънчев", Том 61, серия 11.1, ISSN: 1311-3321).

Power Quality Analyser MI 2885 Master Q4. Manual. Metrel, 2021.

## A MODEL FOR SIMULATION OF SEPARATELY EXCITED DC MOTORS IN VIRTUAL ENVIRONMENTS

#### Assoc. Prof. Boris Evstatiev, DSc

Department of Electronics, University of Ruse "Angel Kanchev" Tel.: +359 82 888 547 E-mail: bevstatiev@uni-ruse.bg

#### Assist. Prof. Katerina Gabrovska-Evstatieva, PhD

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

**Abstract:** The paper presents the development of an equivalent electrical circuit, which can be used for simulation of separately excited DC motors in virtual environments, such as EVEEE, MicroCap, etc. In the accepted system analogy, the rotation speed corresponds to voltage and the torque – to current. The mass moment of inertia corresponds to the electric capacitance of the circuit and the constant, which represents the friction corresponds to the electric resistance. The study presents simulation results for two scenarios – when the motor is operated at nominal rate and when the motor is less loaded. All results indicate that the developed equivalent circuit allows to perform simulations, which correspond to the operation characteristics of separately excited DC motors.

*Keywords:* system analogy, DC motor, equivalent electric circuit, transient response, virtual environments. *JEL Codes:* L60

#### REFERENCES

Chaturvedi, S. K., & Dharwadkar, K. A. (2011). Simulation and Visualization Enhanced Engineering Education- Development and Implementation of Virtual Experiments in a Laboratory Course. MECHANICAL & AEROSPACE ENGINEERING, 87, 1-15.

Ivanov, I. (2016) Lecture notes in Construction mechanics for the specialty "Constuctrion engineering". Online: http://ivivanov.orgfree.com/courses.html. (**Оригинално заглавие:** Иванов, И., 2016. Записки на лекции по Строителна механика за специалността "Строително инженерство").

Shneidman, V. A. (2021). *Lecture notes for Phys 111*. Mechanics. Department of Physics, New Jersey Institute of Technology, Newark, NJ.

Brick, J. (2021). An Integrated, Quantitative Introduction to the Natural Sciences, Part 1: Dynamical Models. Princeton University, Princeton, NJ.

Mungan, C. E. (2012). Frictional torque on a rotating disc. Eur. J. Phys., 33, 1119-1123.

Sannibale, V. de O. (2012). Freshman Physics Laboratory (PH003). Classical Mechanics. The Maxwell Top: Chapter 2. California Institute of Technology, Physics Mathematics AND Astronomy Division.

Pavlov, V., & Dimitrova, R. (2019). Selection of Stepper Motors for Open Scheme Robots. IN: Compilation of Reports from the Twenty-Eighth International Scientific and Technical Conference "Automation of Discrete Production", Sozopol. (**Оригинално заглавие:** Павлов, В., & Димитрова, Р., 2019, Избор на стъпкови двигатели за роботи при отворена схема на управление. IN: Сборник доклади от двадесет и осмата международна научно-техническа конференция "Автоматизация на Дискретното Производство". Созопол).

Stefanov, I., Stoyanov, S., Hristov, L., Kucev, M., Robev, M. & Hristov, N. (1972), Spravochnik na energetika, Sofia, Tehnika (Оригинално заглавие: Стефанов, И., Стоянов, С., Христов, Л., Куцев, М., Робев, Б., & Христов, Н., 1972, Справочник на енергетика, София, Техника).

# SUBSTANTIATION OF SOLAR INTENSITY LEVELS AND BIOLOGICAL NEEDS FOR LIGHTING DURING GREENHOUSE ROTATING FRUIT AND VEGETABLE PRODUCTS IN ALMATY REGION

### PhD student B.N. Bekaidarova

Department of Energy Supply and Automation, Kazakh National Agrarian Research University, Kazakhstan Tel.: 87472313191 E-mail: baha\_0504@mail.ru

#### Prof. A.K. Atyhanov, DcTS

Department of Agrarian technic and tehnology, Kazakh National Agrarian Research University, Kazakhstan Phone: 87078876403 E-mail: Atihanov@mail.ru

**Abstract:** The purpose of the article is to monitor the level of solar intensity during the period of growing fruits and vegetables in a greenhouse in the Almaty region. Through monitoring, the most comfortable conditions for the growth and development of plants in the production of fruits and vegetables are provided. Monthly solar intensities for November, December, January, February, March were measured and an assessment was made for the biological needs for lighting during the period of growing tomatoes in greenhouses in the Almaty region. It has been established that the intensity of the sun's rays in winter decreases by more than 10 times, therefore, in order to enhance the illumination, it will be necessary to additionally illuminate in the winter time of the day.

**Keywords:** Greenhouse production, plant, automation, microclimate, illumination, monitoring, increase in productivity.

JEL Codes: L60

#### REFERENCES

Mazaev L.R. Method of calculation and design of a solar greenhouse for the region of Siberia: Candidate of Technical Sciences. - Barnaul, 2010. – 17 p.

M.A. Labrador, A.J. Perez, P.M. Whiteman, Location-based information systems: Development of real-time tracking applications, Chapman & Hall series / CRC Computer & Information Science, October,

R.G. Zayats, I.V. Rachkovskaya, V.M. Stambrovskaya. Biology manual for applicants - 4th ed. – Minsk: Higher School, 1998. – 510 p.

R. Paradiso, E. Meinen, J. F.H. Snel, P. De Visser, W. V. Ieperen, S. W. Hogewoning, L. F.M. Marcelis, Spectral dependence of photosynthesis and light absorptance in single leaves and canopy in rose, Scientia Horticulturae 127 (2011), pp. 548–554

H.M. Wollaeger, E.S. Runkle, "Green light: Is it important for plant growth?", 2014, Michigan State University Extension..[Online]. Available:

http://msue.anr.msu.edu/news/green\_light\_is\_it\_important\_for\_plant\_gr owth (5-25-2016).

Hight Power Lighting Corp., Specification for Color Series HPL.[Online]. Available: http://www.hplighting.com.tw/ (5-25-2016).

R.E. Koning, 1994. Light. Plant Physiology Information [Online]. Available: http://plantphys.info/plant\_physiology/light.shtml . (5-25-2016).

# A COMPARATIVE ANALYSIS OF OPTICAL INSTRUMENTS PROPERTIES FOR THE PREDICTION OF MAIN CHARACTERISTICS OF ENGINE OILS

### Dipl. Eng. A. Ivanova-Vasileva,

Department of Automatics and Mechatronics, University of Ruse, Bulgaria Tel.: +359 895 464 717 E-mail: avasileva@uni-ruse.bg

### Assoc. Prof. Zlatin Zlatev, PhD

Department of Technics and Technologies, Trakia University Tel.: +359 897 859 912 E-mail: zlatin.zlatev@trakia-uni.bg

#### Assoc. Prof. Tsvetelina Georgieva, PhD

Department of Automation and Mechatronics, University of Ruse "Angel Kanchev" 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:** In the existing work, a comparative analysis of four measuring devices, operating on optical principle, was made to predict the main characteristics of motor lubricating oils. According to the colorimeter data, the regression models were found to have higher predictive properties than those obtained with a video camera and digital camera. The proposed research tools can be used with single-board microcomputer systems, which do not require complex computational procedures. The use of the proposed in this article techniques and tools in practice would reduce the effect of the measuring instrument experience.

Keywords: Optical sensors, Oil production, Regression analysis, Color components, Optical instruments, Principal component analysis

JEL Codes: L63; L 64

## REFERENCES

Kazakov, P., Dimitrov, M., Vasilev, M. (2017). Automobile oils parameters prediction by spectral characteristics. Proceedings of University of Ruse, 56(4), 142-146.

Sejkorová, M., Hurtová, I., Jilek, P., Novák, M., Voltr, O. (2021). *Study of the Effect of Physicochemical Degradation and Contamination of Motor Oils on their Lubricity*. Coatings, 11(1), 60.

Hadi, M.H., Ker, P.J., Lee, H.J., Leong, Y.S., Hannan, M.A., Jamaludin, M., Mahdi, M.A (2021). Color Index of Transformer Oil: a Low-Cost Measurement Approach Using Ultraviolet-Blue Laser. Sensors, 21(21), 7292.

Kanyathare, B., Kuivalainen, K., Räty, J., Silfsten, P., Bawuah, P., Peiponen, K-E. (2018). a *prototype of an optical sensor for the identification of diesel oil adulterated by kerosene*. Journal of the European Optical Society-Rapid Publications, 14(1), 1-6.

Pathare, P.B., Opara, U.L., Al-Said, F.AJ. (2013). Colour measurement and analysis in fresh and processed foods: a review. Food Bioprocess Technol 6(1), 36-60.

Frank, A. (2010). *UCI Machine Learning Repository*. Irvive, CA: University of California, School of Information and Computer Science. http://archive.ics.uci.edu/ml

Ranjbarzadeh, R., Chaabane, R. (2021). Experimental study of thermal properties and dynamic viscosity of graphene oxide/oil nano-lubricant. Energies, 14(2886), 1-16.

Veleva P., Nikolova, M., Georgieva, Ts. (2020). *Study on the effect of some major environmental factors on the egg-laying capacity of free-range Guinea fowls (Numida meleagris).* 7th International Conference on Energy Efficiency and Agricultural Engineering (EE&AE), 1-4. IEEE.

Alsouda, Y., Pllana, S., Kurti, A. (2018). a machine learning driven IoT solution for noise classification in smart cities. arXiv preprint arXiv:1809.00238

Holzki, M., Fouckhardt, H., Klotzbücher, T. (2012). Evanescent-field fiber sensor for the water content in lubricating oils with sensitivity increase by dielectrophoresis. Sensors and Actuators A: Physical, 184, 93-97.

Heredia-Cancino, J.A., Carrillo-Torres, R.C., Félix-Domínguez, F., Álvarez-Ramos, M.E. (2021). *Experimental Characterization of Chemical Properties of Engine Oil Using Localized Surface Plasmon Resonance Sensing*. Applied Sciences, 11(8518), 1-11.

# DESIGN AND DEVELOPMENT OF A TEST BENCH FOR SQUIRREL CAGE INDUCTION MOTOR

Assistant. Prof Dimitar Trifonov, PHD Department of Electronic, University of Ruse " Angel Kunchev", Ruse, Bulgaria Tel.: 359883405725 E-mail: dtrifonov@uni-ruse.bg

**Abstract:** In industry electric drives a key point is knowledge of the operating characteristics of the electric motor driving them. The purpose of stady is developing a stand for measuring the characteristics of an asynchronous motors. Which will give the opportunity to study different modes of operation of the squirrel cage induction motors and will help for determining the optimal mode of operation.

*Keywords:* Squirrel cage induction motor, charecteristics, modes, efficiency. *JEL Codes:* L60

### REFERENCES

Dimitrov, V., Kostadinov, Petko. (2020) Development of a laboratory system for the research of engine-generator groups. Mechanics Transport Communications-Scientific journal, 2028.2020/3.

Hasuike, K. (1983) Efficiency improvement studies of low voltage three phase squirrel-cage induction motors for general purpose. IEEE transactions on power apparatus and systems, 12: 3803-3809.

Hristova, M., Ruseva, V., & Krasteva, A. (2022) Constant Losses in Induction Motors and Possible Solutions for their Reduction, 2022 8th International Conference on Energy Efficiency and Agricultural Engineering (EE&AE), pp. 1-4, doi: 10.1109/EEAE53789.2022.9831226.

Dongdong Z., An, R., Wu, T. (2018) Effect of voltage unbalance and distortion on the loss characteristics of three-phase cage induction motor. IET Electric Power Applications, 12.2: 264-270.

# POSSIBILITIES FOR THE IMPLEMENTATION OF INTELLIGENT LIGHTING SYSTEMS WITH THE APPLICATION OF BMS

#### Mag. Eng. Cvetomir Lukanov

Department of Electrical Power Engineering, "Angel Kanchev" University of Ruse E-mail: lukanov83@abv.bg

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:** Intelligent systems for automated lighting control provide increased energy saving, improved convenience and comfort. Building management systems (BMS) are the "backbone" of such facilities. They stand out with their great possibilities for synchronizing and optimizing the work of various systems and services (lighting, heating, security, video surveillance, ventilation, air conditioning, access control, fire safety and others). Lighting management is also integrated in these platforms – in newly constructed buildings as well as in retrofitting of existing architectural objects.

The report presents an overview and comparative analysis of the possibilities for implementing intelligent lighting systems. The ways of implementing such systems are described, as well as some of their features. Advantages and disadvantages of BMS are presented, with the idea that they can more easily integrate different algorithms for lighting control.

Relevant conclusions and recommendations are drawn for the construction of intelligent lighting systems.

*Keywords: BMS*, *Inteligent lighting*. *JEL Codes: L60* 

## REFERENCES

EN 12464-1:2016. Light and lighting - Lighting of work places - Part 1: Indoor work places.

M. Miki, T. Hiroyasu, K. Imazato, M. Yonezawa. Intelligent lighting control using correlation coefficient between luminance and illuminance. Proceeding IASTED Intelligent Systems and Control, Vol.497, No.078, pp.31-36, 2005.

Miki, M, Hiroyasu T, Imazato K. Proposal for an Intelligent Lighting System, and Verification of Control Method Effectiveness Proceeding IEEE CIS, Page520-525, (2004)

Zhenfeng Li, Jingtao Li, Xiaofan Li, Yijian Yang, Jie Xiao, Bowen Xu, Design of Office Intelligent Lighting System Based on Arduino, Procedia Computer Science, Volume 166, 2020, Pages 134-138, ISSN 1877-0509, https://doi.org/10.1016/j.procs.2020.02.035.

L. Deng-feng, B. Yun-ting, W. He and L. Hu, "Design of intelligent lighting control system," 2011 IEEE International Conference on Cyber Technology in Automation, Control, and Intelligent Systems, 2011, pp. 134-137, doi: 10.1109/CYBER.2011.6011779.

M. Miki, E. Asayama and T. Hiroyasu, "Intelligent Lighting System using Visible-Light Communication Technology," 2006 IEEE Conference on Cybernetics and Intelligent Systems, 2006, pp. 1-6, doi: 10.1109/ICCIS.2006.252257.

F. Shi, Z. Kou, J. Chen and W. Li, "Design and Application of Intelligent Lighting Control System for Classrooms Based on PLC," 2020 IEEE 5th Information Technology and Mechatronics Engineering Conference (ITOEC), 2020, pp. 1268-1271, doi: 10.1109/ITOEC49072.2020.9141695.

Kyuchukov, R., T. Kyuchukov. Sustainable Lighting Solutions to Electrical Energy Compsumtion. Illumination Towards Multifunctional and Multiple Domestic Lighting Installations. IN: Proceedings Lighting Engineering 2008, BalkanLight 2008 Ljubljana, Slovenia, 2008, ISBN 978-961248-127-8.

# APPLICATION OF THE RADIANCE SOFTWARE IN TRAINING LIGHTING ENGINEERING STUDENTS

### Mag. Eng. Metin Ibryamov

Department of Electrical Power Engineering, "Angel Kanchev" University of Ruse Phone: +359 887 250 820 E-mail: mibryamov@uni-ruse.bg

### 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 training of highly qualified professionals in lighting technology requires continuous improvement, refinement and addition of already existing training materials. The traditional way of teaching in itself is no longer sufficient in the conditions of rapidly developing digital educational technologies. The need for a visual presentation of electrical parameters of the lighting systems depending on the environment is a prerequisite for the application of the RADIANCE software in training students in lighting technology. The report provides an analytical overview of a free sophisticated lighting visualization system that generates virtual images that are indistinguishable from real photos. The advantages and disadvantages of the finished system are presented, and the relevant conclusions are drawn.

*Keywords:* RADIANCE, Lighting Technology, Digital Educational Technologies, Electrical Parameters of The Lighting Systems, Sophisticated Lighting Visualisation System *JEL Codes:* L60

## REFERENCES

Budak, V., Makarov, D. (2020), *Computer Graphics: New Horizons in the Education of Lighting Designers and Engineers*, In: CEUR Workshop Proceedings.

WARD, Gregory J. (1994), *The RADIANCE lighting simulation and rendering system*, In: Proceedings of the 21st annual conference on Computer graphics and interactive techniques, 459-472.

Jacobs, A. (23 January 2012), Radiance Tutorial,

http://www.jaloxa.eu/resources/radiance/documentation/docs/radiance\_tutorial.pdf

Ibryamov, M., Petrov, O. (2022), *Implementation of a Virtual Light Laboratory*, In: Proceedings of the 15th annual International Conference of Education, Research and Innovation, Seville (Spain), 7th-9th November 2022.

Ibryamov, M., Petrov, O. (2021), *Review of existing lighting laboratories for education in virtual environment. Could a lighting virtual laboratory develop?*, In: Proceedings of the 15th International forum for young lighting technicians (Original: Internationales Forum für den lichttechnischen Nachwuchs) (Germany) (online), 4th-6th June 2021.

Ahmed, D., Ibryamova, E. (2021), Development and investigation of training software in support of the discipline "Computer Graphics Systems" (Оригинално заглавие: Създаване и изследване на обучителен софтуер в помощ на дисциплината "Компютърни графични системи"), In: 60th Science Conference of Ruse University – SSS, Bulgaria, 2021, Ruse, Bulgaria, University of Ruse "Angel Kanchev", 2021, 148-152.

Beloev, H., Smrikarov, A., Ivanova, A., Vassilev, T., Georgiev, T., Smrikarova, S., Ivanova, G., Stoykova, V., Ibryamova, E., Aliev, Y., Zlatarov. P. (2020), a *Vision of the University of the Future*, In: ACM International Conference Proceeding Series, 21st International Conference on

Computer Systems and Technologies, CompSysTech 2020, New York, NY, USA, Association for Computing Machinery, 2020, 307–312, ISBN 9781450377683.

Newton, I. (1952), *Opticks (4th ed.)*, Dover/NY: Dover Publications, Book II; Part III; Propositions XII–XX, 25–29, [1730]

Watt, Alan H., Watt, Mark (1992), *Advanced Animation and Rendering Techniques: Theory and Practice*, Addison-Wesley Professional, 21–26.

# EVALUATION OF STATISTICAL PARAMETERS OF OPTICAL SOIL MONITORING DEVICES

#### 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

#### 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

#### Assoc. Prof. Miroslav Mihaylov, PhD

Department of Agricultural Machinery, "Angel Kanchev" University of Ruse Tel.: +359 82 888 782 E-mail: mmihaylov@uni-ruse.bg

Abstract: In the paper application of four different digital optical devices to determine the color characteristics of soil samples are evaluated. Imaging of soil samples from different fields was carried out under the same conditions with a digital camera, a mobile phone camera, a document camera and a hand-held spectral color meter - colorimeter. The resulting images were processed in the MATLAB environment and for each image the average values of the color components in the RGB, HSL and Lab color spaces were obtained. a comparative analysis and evaluation of the statistical parameters of the optical devices was made. Principal component factor analysis, analysis of variance and hypothesis testing were used. Adequate multifactorial models were obtained that explained a very large percentage of the variance of the colour data. It was determined that the digital camera explained the highest percentage, 87.5%, of the total variance of the investigated variables in the R, G, B colour components; V\* from (H\*S\*V\*; b\* from CIE L\*a\*b\*1976 models. The other technical means: mobile phone camera, document camera and colorimeter show almost the same percentage, respectively 81.3%, 81.19%, 81.15%, the total variance and the variability of the factor color characters. The resulting summary factor variables can be applied and used for further statistical processing and regression analysis.

**Keywords:** colour characteristics of soil samples, remote sensing of soil, digital camera, digital images, statistical methods, variance analysis, principal component analysis

JEL codes: L60

#### REFERENCES

A.M. Mouazen, (2007). M. R. Maleki, J. De Baerdemaeker, H. Ramon, *On-line measurement of some selected soil properties using a VIS–NIR sensor*, Soil & Tillage Research 93 (2007) 13–27

Asa Gholizadeh, (2020). Mohammadmehdi Saberioon, Raphael A. Viscarra Rossel, Lubos Boruvka, Ales Klementa, *Spectroscopic measurements and imaging of soil colour for field scale estimation of soil organic carbon*, Geoderma 357 (2020) 113972

Aydemir S. (2004), *Quantification of soil features using digital image processing (DIP)* techniques, Geoderma 119 1 –8

Bünemann E. K. (2018). *Soil quality – a critical review*, Bongiorno G., Bai, Z., Creamer R. E., De Deyn G., Soil Biology and Biochemistry 120, 105–125

Dmitry S. Volkov, (2020). Olga B. Rogova, Mikhail A. Proskurnin, *Photoacoustic and photothermal methods in spectroscopy and characterization of soils and soil organic matter*, Photoacoustics 17 (2020) 100151

Felipe B. de Santana, André M. de Souza, Ronei J. Poppi (2019) Green methodology for soil organic matter analysis using a national near infrared spectral library in tandem with learning machine, Science of the Total Environment 658 895–900

Jannis Heil, (2019). Christoph J<sup>°</sup>orges, Britta Stumpe, *Evaluation of using digital photography as a cost-effective tool for the rapid assessment of soil organic carbon at a regional scale* Department of Human-Environment Research, (2019) Wuppertal, Germany

Lavanya Ga, (2019), Rani Cb, Ganeshkumar, An automated low cost IoT based Fertilizer Intimation System for smart agriculture Artificial Intelligence in Agriculture 2 (2019) 1–12

R.A. Viscarra Rossel, (2006), B. Minasny, P. Roudier, A.B. McBratney, *Colour space models for soil science*, Geoderma 133 (2006) 320–337.

Rossel, V. (2016). Soil sensing: a new paradigm for agriculture, Bouma, J., Agricultural Systems 148, 71–74,

Tian H., (2020). *Computer vision technology in agricultural automation —a review* Wang T., Liu, Y., Qiao X., Li Y., Information processing in agriculture 7, 1–19

Yubing Wang, (2015) Tianyu Huang, Jing Liu, Zhidan Lin, Shanhong Li, Rujing Wang, Yunjian Ge, *Soil pH value, organic matter and macronutrients contents prediction using optical diffuse reflectance spectroscopy*, Computers and Electronics in Agriculture (2015).

https://algoritm-centr.ru/bg/textbooks/chto-takoe-metod-matematicheskoi-statistikimetody-matematicheskoi-statistiki.html, (2020).

### FRI-10.326-2-EEEA-01

# MODELING THE OPERATION OF A SEQUENTIALLY EXCITATION DC ENGINE IN MATLAB/SIMULINK

#### Assoc. Prof. Vyara Ruseva, PhD

Department of Electric Power Engineering University of Ruse "Angel Kanchev", Ruse/Bulgaria Tel.: 082 - 888 616 E-mail: vruseva@uni-ruse.bg

#### Assoc. Prof. Anka Krasteva, PhD

Department of Electric Power Engineering University of Ruse "Angel Kanchev", Ruse/Bulgaria Tel.: 082 - 888 301 E-mail: akrasteva@uni-ruse.bg

**Abstract:** In the current study a virtual stand is examined, through which the operation of a specific sequentially excitation DC motor is simulated in the Matlab/Simulink environment. An approach is presented and data is obtained for constructing the natural and several artificial mechanical characteristics. with the virtual stand, the operational processes of DC motors can be simulated and analyzed during online training of students in the discipline "Electric drive" at the Department of Electric Power Engineering at RU "Angel Kanchev". with the help of the virtual stand can be obtained also data for the construction of other characteristics, using set models from Matlab/Simulink environment or data for various engines, whose parameters must be calculated in advance.

Keywords: Matlab/Simulink, DC motor, Model JEL codes: L60

#### REFERENCES

Krasteva, A., (2020). Modelling and optimization of electrical energy consumption in electric drives, Academic publishing house of University of Ruse, Ruse, pp. 110 (*Оригинално заглавие:* Кръстева, А. (2020). Моделиране и оптимизиране разхода на електрическа енергия при електрически задвижвания. Русе, Академично издателство на Русенския университет, стр. 110)

Krasteva, A., (2013). Study of a parallel excitation DC engine in Matlab/Simulink program environment, In: Scientific papers of RU "Angel Kanchev", Ruse (**Оригинално заглавие**: Кръстева, А. (2013). Изследване на постояннотоков двигател с паралелно възбуждане в програмната среда Matlab/Simulink. В: Научни трудове на РУ'Ангел Кънчев", Русе)

Krasteva, A., (2013). Methodological guidelines for the study of an independent excitation DC motor in Matlab/Simulink programming environment, In: May Scientific Readings, Ruse (**Оригинално заглавие:** Кръстева, А. (2013). Методични указания за изследване на постояннотоков двигател с независимо възбуждане в програмната среда на Matlab/Simulink. В: Майски научни четения, Русе)

Lurie S., O. Lurie, (2005). Simulation modeling in a laboratory workshop, course and diploma design. Schollbook – Part of Krasnoyarsk. (**Оригинално заглавие:** Лурье С., О. Лурье, (2005). Имитационное моделирование в лабораторном практикуме, курсовом и дипломном проектировании. Учебное пособие - Часть Красноярск)

Chernykh I. V., (2008). Modeling of electrical devices in MATLAB, SimPowerSystems and Simulink, DMK Press, Moscow. (Оригинално заглавие: Черных И. В., (2008). Моделирование

электротехнических устройств в MATLAB, SimPowerSystems и Simulink, ДМК Пресс, Москва)

Semyonov A.S., Khubieva V.M., Petrova M.N., (2015). Mathematical modeling of operating modes of a DC motor in Matlab environment, Journal of Fundamental Research № 10 (part 3), pp. 523-528. (Оригинално заглавие: Семёнов А.С., Хубиева В.М., Петрова М.Н.,(2015). Математическое моделирование режимов работы двигателя постоянного тока в среде Matlab Журнал Фундаментальные исследования. – № 10 (часть 3) – стр. 523-528)

Semyonov A.S., (2014). Simulation of a rheostatic start of an independent excitation DC motor, Journal of Applied and Basic Research №9, pp. 29-34. (Оригинално заглавие: Семёнов А.С. Моделирование реостатного пуска двигателя постоянного тока с независимым возбуждением. Журнал Прикладных и фундаментальных исследований №9, стр. 29-34.)

# ANALYSIS OF THE FACTORS AFFECTING HOUSEHOLD ELECTRICITY CONSUMPTION

### Assoc. Prof. Vyara Ruseva, PhD

Department of Electric Power Engineering University of Ruse "Angel Kanchev", Ruse/Bulgaria Tel.: 082 - 888 616 E-mail: vruseva@uni-ruse.bg

#### Assoc. Prof. Anka Krasteva, PhD

Department of Electric Power Engineering University of Ruse "Angel Kanchev", Ruse/Bulgaria Tel.: 082 - 888 301 E-mail: akrasteva@uni-ruse.bg

Abstract: In the paper, for evaluating the degree of influence of individual factors on household electricity consumption, a dimensionless coefficient is introduced, representing the ratio of capacities or consumed energy for an average dwelling place from the three typical groups obtained at the two extreme levels of the relevant factor. The degree of influence of the factors with a periodic, determined, determined with random change over a long period of time and random characters on household electricity consumption was analyzed. It was established, that for the electric energy price, its ratio with the prices of other energy sources and the tariff policy, final levels of the factor cannot be fixed. It is shown the change in the regulated electricity prices for household subscribers supplied by Elektrorazpradelenie Sever. Given the current political and economic situation in Europe, it is difficult to predict how the change in electricity consumers will affect their electricity loads

*Keywords:* household electricity load charts, specific indicators of household electricity *JEL codes:* L60

## REFERENCES

Ordinance No 3 on the electrical systems and power lines. (2004). Sofia, Balkanpress, p. 542. (**Оригинално заглавие:** Наредба № 3 за устройството на електрическите уредби и електропроводните линии, 2004, София, Балканпрес, стр.542)

Ordinance No 18 on the energy characteristics of objects, published on State newspaper 12/11/2004. (**Оригинално заглавие:** Наредба  $N_{2}$  18 за енергийните характеристики на обектите. Публикувана в Държавен вестник 12/11/2004)

Ruseva, V. (2002). Study of household electricity consumption. Dissertation for the award of the educational scientific degree Doctor, Specialized Scientific Council in Electrical Engineering, 2002, Sofia. (Оригинално заглавие: Русева В., 2002. Изследване на битовото електропотребление. Дисертация за присъждане на образователна научна степен доктор, Специализиран научен съвет по електротехника, София)

Ruseva, V. (2020). Analysis of household electricity consumption in Bulgaria, Monograph, Ruse, Academic Publishing House of the University of Ruse "Angel Kanchev", p. 110, ISBN 978-954-712-824-8. (Оригинално заглавие: Русева В., 2020. Анализ на битовото електропотребление в България. Монография, Русе, Академично издателство на Русенския университет "Ангел Кънчев", стр. 110, ISBN 978-954-712-824-8)

Ruseva V. (2020). *Study of specific indicators characterizing the consumption of electricity in single family houses for a five-year period*. in: Proceedings of University of Ruse - 2020, volume 59, book 3.1., RUSE, UNIVERSITY OF RUSE, 2020, pp. 58-63.

https://ec.europa.eu/eurostat/statisticsexplained/index.php?title=Electricity\_price\_statistics&action=statexp-seat&lang=bg

## LINEAR QUADRATIC CONTROL OF A SERVO SYSTEM

#### Assoc. Prof. Donka Ivanova, PhD

Department of Automatics and Mechatronics, "Angel Kanchev" University of Ruse Phone: +359 82 888 266 E-mail: divanova@uni-ruse.bg

#### Assist. Prof. Martin Dejanov, PhD

Department of Automatics and Mechatronics, "Angel Kanchev" University of Ruse phone: +359 82 888 747 E-mail: mdejanov@uni-ruse.bg

Abstract: Linear Quadratic control of a servo system is synthesized in the current paper. Linear quadratic regulator parameters are determined using genetic algorithm. a laboratory modular servo system by INTECO Company is used in combination with Matlab/Simulink. The results of the synthesis are compared with a PD controller system, also tuned using the genetic algorithm, and show that both synthesized systems satisfy the contradictory performance requirements for system speed and control output magnitude.

*Keywords:* Servo system, Linear Quadratic control, PD control *JEL code:* L60

#### REFERENCES

Das, S., I. Pan, K. Halder, S. Das, A. Gupta. (2013). LQR based improved discrete PID controller design via optimum selection of weighting matrices using fractional order integral performance index. Applied Mathematical Modelling, 37(6), 4253-4268.

Franklin, G. T., J. D. Poweel, A. Emami – Naeini. Feedback Control of Dynamic Systems. Pretice Hall, Upper Saddle River, N. J., 2009.

Lehov, G., D. Ivanova. (2019). Control Theory – I, Academic Publishing House of Ruse University. Ruse. (Оригинално заглавие: Лехов, Г., Д. Иванова. "Теория на управлението" - Част 1, Академично издателство на Русенския университет, Русе, 2019, стр. 254.)

Madzharov N., E. Haralanova. (2004). Engineering methods for the study of linear control systems. TU, Sofia. (Оригинално заглавие: Маджаров, Н., Е. Хараланова. Инженерни методи за изследване на линейни системи за управление. ТУ, София, 2004.)

Modular Servo System. User's Manual, 2013.

www.inteco.com.pl (Accessed on 07.10.2022)

http://www.inteco.com.pl/wp-content/uploads/2014/05/RTDAC\_USB2.pdf (Accessed on 07.10.2022)

## ASSESSMENT OF THE QUALITY OF MEASUREMENT OF PARAMETERS IN ANIMAL FARM

#### Eng. Belma Gaazi

Department of Automatics and Mechatronics, "Angel Kanchev" University of Ruse Tel.: +359 82 888 676 E-mail:bgaazi@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: In the paper evaluates the application and quality of temperature measurements with three different devices in an animal husbandry. Measurements were made under the same environmental conditions with different devices: a mercury thermometer with an accuracy of 0.01 °C, a non-contact thermometer and a thermal camera. Measurements were also taken of the surface temperature of the cows without contact to assess the internal temperature of the animal, which is a significant criterion for assessing their well-being, and the accuracy of the measurements of the selected devices was also determined. from the measurements, the relationship between the ambient temperature and the surface temperature of the animal was also evaluated. from the conducted research, we can conclude that modern non-contact devices, and in particular thermal cameras, provide reliable, fast and accurate information about the well-being of animals. This information is extremely useful for breeders to predict at an early stage of ongoing livestock diseases such as cow mastitis and to assess the impact of the environment, especially in summer, which can help prevent the effects of heat stress. The application of modern methods for measuring environmental parameters give each breeder a clear idea of the state of the herd, thus they can prepare and implement appropriate solutions to reduce heat stress and animal diseases.

*Keywords:* temperature, animal husbandry, thermal camera, non-contact thermometer, heat stress *JEL code:* L60

#### REFERENCES

Boyu Ji, (2020). Thomas Banhazi, Kristen Perano, Afshin Ghahramani, Les Bowtell, Chaoyuan Wang, Baoming Li, a *review of measuring, assessing and mitigating heat stress in dairy cattle*, Biosystems engineering 199 (2020) 4-26

Frank J. C. M. van Eerdenburg, (2021). Alice M. Di Giacinto, Jan Hulsen, Bert Snel, J. Arjan Stegeman, a *New, Practical Animal Welfare Assessment for Dairy Farmers*, Animals 2021, 11, 881.

Fu-Kang Wang, (2021). Ju-Yin Shih, Pin-Hsun Juan, Ya-Chi Su, Yu-Chieh Wang, Non-Invasive Cattle Body Temperature Measurement Using Infrared Thermography and Auxiliary Sensors, Sensors (Basel). 2021 Apr; 21(7): 2425.

J. Brouček, (2006). S. Mihina, S. Ryba, P. Tongel', P. Kišac, M. Uhrinčať, A. Hanus, *Effects of high air temperatures on milk efficiency in dairy cows*, Czech J. Anim. Sci., 51, 2006 (3): 93–101

J. W. West, (2003). *Effects of Heat-Stress on Production in Dairy Cattle*, Journal of Dairy Science, Volume 86, Issue 6, June 2003, Pages 2131-2144

H. Spoolder, (2003). Giuseppe De Rosa, B. Horning, Françoise Wemelsfelder, *Integrating parameters to assess on-farm welfare*, Animal welfare (South Mimms, England) 12(4) (2003)

Michał Switłyk, (2021). Agnieszka Sompolska-Rzechuła, Agnieszka Kurdy's-Kujawska, *Measurement and Evaluation of the Efficiency and Total Productivity of Dairy Farms in Poland*, Agronomy 2021, 11, 2095.

S. Murugeswari, (2022). Kalpana Murugan, S. Rajathi, M. Santhana Kumar, *Monitoring body temperature of cattle using an innovative infrared photodiode thermometer*, Computers and Electronics in Agriculture, Volume 198, July 2022, 107120

Sha Tao, (2020). Ruth M.Orellana Rivas, Thiago N.Marins, Yun-Chu Chen, Jing Gao, John K.Bernard, *Impact of heat stress on lactational performance of dairy cows*, Theriogenology Volume 150, 1 July 2020, Pages 437-444

Piotr Herbut, (2018). Sabina Angrecka, Jacek Walczak, *Environmental parameters to assessing of heat stress in dairy cattle—a review*, International Journal of Biometeorology volume 62, pages2089–2097 (2018)

Vesna Gantner, (2011). Pero Mijić, Krešimir Kuterovac, Drago Solić, Ranko Gantner, *Temperature-humidity index values and their significance on the daily production of dairy cattle*, Daily production of dairy cattle, Mljekarstvo 61 (1), 56-63 (2011)

https://smaxtec.com/en/blog/measuring-inner-body-temperature-of-dairy-cows/ (2020)

# APPLICATION OF THE E-HEALTH AND PREVENTION SYSTEM IN PHYSIOTHERAPEUTIC PROCEDURES

#### Assoc. Prof. Aneliya Manukova, PhD

Department of Electronics "Angel Kanchev" University of Ruse E-mail: amanukova@uni-ruse.bg

### Chief Assis. Prof. Aleksander Andreev, PhD

Department of Public Health, "Angel Kanchev" University of Ruse E-mail: aandreev@uni-ruse.bg

Abstract: The study presents the application of an e-Health and prevention system in physiotherapy procedures – kinesitherapy and reshaped physical factors and the echo of physical and emotional stress on the patients' electrocardiographic signals and the work of the cardiovascular system. In ambulatory practice, a series of tests aimed at registering changes in individual fragments of the ECG curve were carried out and evaluated by prevention markers supplementing medical markers. The challenges in the application of electronic health care in the prevention of the cardiovascular system, combining technical, clinical, psychological and social analyzes in order to ensure a normal social and work environment for people, have been studied and evaluated... The e-Health and Prevention system provides a reliable environment for evaluating the current state of the examined through flexibility and mobility, and provides the possibility of upgrading for application in various spheres of work and life. a functional analysis is given in view of the upcoming increased demands of the body under normal and pathological conditions during physiotherapy activities.

*Keywords:* electronic system, electrocardiographic signal, electronic health, prevention, physical therapy. *JEL code:* L60

## REFERENCES

Cholakov O. (2008) *Mountainous Medicine*, pp. 45, Club 45, Sofia, ISBN-10:954-91750-1 (Оригинално заглавие: Чолаков О. (2008) Планинска медицина, стр.45, Клуб 45, София, ISBN-10:954-91750-1)

Clark A, King-Shier K, Duncan A, et al. (2012) *Factors influencing referral to cardiac rehabilitation and secondary prevention programs: a systematic review*. Eur J Prev Cardiol 2012; 20: 692–700.

Frederix I, Caiani EG, Dendale P, et al. (2019) *ESC e-Cardiology Working Group Position Paper: Overcoming challenges in digital health implementation in cardiovascular medicine*. Eur J Prev Cardiol. 2019; 26(11):1166-1177. DOI:10.1177/2047487319832394

Frederix I, Vandenberk T, Janssen L, et al. eEduHeart I: (2017) a multicenter, randomized, controlled trial investigating the effectiveness of a cardiac web-based eLearning platform – rationale and study design. Cardiology 2017; 136: 157–163.

Jelev V. (2011) *Phisyotherapy – part 4*, pp. 249, Avangard Prima, Sofia, ISBN: 978-954-323-872-9 (Оригинално заглавие: Желев В. (2011) *Физиотерания – четвърта част*, стр. 249, Авангард Прима, София, ISBN: 978-954-323-872-9)

Manukova A., T. Sokolov, M. Marinov. (2022) Innovative Concept of Application of Electronic Modeling in Building e-Health Systems. TEM Journal, 11(3), 1149-1153, DOI: 10.18421/TEM113-20.

Manukova A., I. Georgiev, M. Marinov. (2020) *Statistically Based Criteria for Complex ECG Signal Assessment at Preventive Cardio Control*. In Proceedings of the 21st International Conference on Computer Systems and Technologies (CompSysTech '20), June 19-20, 2020, Ruse, Bulgaria, 2020, No 6, pp. 169-174, https://doi.org/10.1145/3407982.3407985 (SJR rank: 0.2 /2019)

Регссерии I. (2000) Cardiology Rehabilitation, pp. 12, Znanie, Sofia, ISBN: 9546211524 (Оригинално заглавие: Перчев И. (2000) Кардиологична рехабилитация, стр. 12, Знание, София, ISBN: 9546211524

Ruano-Ravina A, Pena-Gil C, Abu-Assi E, et al. (2016) *Participation and adherence to cardiac rehabilitation programs. a systematic review.* Int J Cardiol 2016; 223: 436–443.

Slantchev P. (1998) Sports Medicine, pp.60, NSA-Pres, Sofia, ISBN, 954-9740-0-X (Оригинално заглавие: Слънчев П. (1998) Спортна Медицина, стр.60, НСА-Прес, София, ISBN, 954-9740-0-X)

Watanabe, M. A., and G. Schmidt. (2004) *Heart Rate Turbulence: a 5-Year Review*, Heart Rhythm, Vol. 1, No. 6, December 2004, pp. 732–738.

Ward, S., et al. (2004) *Electrocardiogram Sampling Frequency Errors in PR Interval Spectral Analysis*, Proc. IEEE PGBIOMED'04, Southampton, UK, August 2004.

# ANALYSIS OF ELECTRONIC SYSTEMS FOR CONTROL OF SMART GREENHOUSES

### **Amjed Kraiem**

Canakkale ONSEKIZ MART university, Turkey Faculty of Agriculture Department of Agricultural Machinery and Technologies Engineering Tel.: +90 536 466 870 E-mail: 180617020@ogr.comu.edu.tr

### Sime Saka

Canakkale ONSEKIZ MART university, Turkey Faculty of Agriculture Department of Agricultural Machinery and Technologies Engineering Tel.: +90 544 662 4521 E-mail:190617025@ogr.comu.edu.tr

### Assoc. Prof. Dr. Seher Kadirova

University of Ruse, Bulgaria Department of Electronics Tel.: +359 877 089 537 E-mail: skadirova@uni-ruse.bg

Abstract: Agriculture is a major part of our lives as humanbeings. a lot of research has been carried out in order to be able to develop a monitored and controlled greenhousesystem/environment that will help in solving the mainproblems relating to agriculture which is to enable theincrease in the crops being cultivated all year round in thecomfort of a small space like the home. Greenhouses help to protect crops from many diseases, particularly those that are soil born and splash onto plants in the rain. Numerous farmers fail to get good profits from the greenhouse crops for the reason that they can't manage two essential factors, which determines plant growth as well as productivity. Green house temperature should not go below a certain degree, High humidity can result to crop transpiration, condensation of water vapor, and water evaporation from the humid soil. to overcome such challenges, this greenhouse monitoring and control system comes to rescue. This project demonstrates the design and implementation of a various sensors for greenhouse environment monitoring and controlling. The main idea of the project is to do a research on excisting methods and technologies related to control of parameters in a greenhouse.

Keywords: Greenhouse, Control, Electronic System, Arduino JEL code: L60

## REFERENCES

Gaikwad A., Ghatge A., Kumar H., & Mudliar K., (2016), *Monitoring of Smart Greenhouse*, International Research Journal of Engineering and Technology (IRJET), India, Volume: 03 Issue: 11/ Nov -2016, e-ISSN: 2395 -0056, p-ISSN: 2395-0072

Dwinugroho, T., Hapsari, Y., & Kurniawanti, (2020), *Greenhouse automation: smart* watering system for plants in greenhouse using programmable logic control (PLC), Journal of Physics: Conference Series, Volume 1823, Second UPY International Conference on Applied Science and Education (2nd UPINCASE) 3-4 November 2020, Yogyakarta, Indonesia.

Öztürk, E., Çelik, Y., & Kırcı, P. (2021), *Akıllı Tarımda Sensör Uygulaması*, Avrupa Bilim ve Teknoloji Dergisi, (28), 1279-1282.

Yahaya, A., Abass, Y., & Adeshina A., (2019), *Greenhouse Monitoring and Control System* with an Arduino System, 15th International Conference on Electronics, Computer and Computation (ICECCO), pp. 1-6

# ANALISYS AND INVESTIGATION OF DIELECTRIC POLARIZATION: A REVIEW

#### Negrea Andrei-Alexandru

Naval Academy "Mircea cel Batran", Romania Department of Electrical Engineering E-mail: anegrea02@gmail.com

#### Pauna George-Viorel

Naval Academy "Mircea cel Batran", Romania Department of Electrical Engineering E-mail: paunaviorel92@gmail.com

### Doaga Florin-Adrian

Naval Academy "Mircea cel Batran", Romania Department of Electrical Engineering E-mail: florin4431adrian@gmail.com

### **Prof. Dr Nicolay Mihailov**

University of Ruse, Bulgaria Department of Electrical Power Engineering E-mail: mihailov@uni-ruse.bg

#### Assoc. Prof. Dr. Seher Kadirova

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

#### **Marius Cucu**

Naval Academy "Mircea cel Batran", Romania Department of Naval Electromechanical Systems E-mail: marius.cucu@anmb.ro

**Abstract:** The concept of this review is to present an overview of the state of the art concerning the fundamental properties of electrode polarization of interest in the measurement of high conductivity samples and its implications for both dielectric and impedance spectroscopy. It is shown that no energy is needed for a polarization of molecules in a dielectric. Electric energy of a dielectric exceeds electric energy of an empty space with the same macroscopic electric field because of a non-uniformity of the real electric field in the dielectric. Initially a detailed description of what constitutes electrode polarization is provided and the problems that it induces. Finally, we also review recent attempts to employ fractal electrodes to bypass the effects of electrode polarization and to offer some physical explanation as to the limitations of their use.

*Keywords:* Electrode Polarization, Dielectric, Impedance Spectroscopy *JEL code:* L60

## REFERENCES

Kumar, M., Pradhan, L., Mallick, J., Shukla, A., Kumari, S., Yadav, M., Rout, S. & Kar, M. (2022), *Study of dipole polarization in Zn doped barium hexaferrite*, Materials Today: Proceedings, Volume 66, Part 4, Pages 1862-1864, ISSN 2214-7853.

Khrapko, Radi I. (2021). *Polarization energy of a dielectric*, Moscow Aviation Institute, 125993, Moscow, Russia.

Kim, Minsoo P., Um, D., Shin, Y. & H, Ko. (2021) *High-Performance Triboelectric Devices* via Dielectric Polarization: a Review, Kim et al. Nanoscale Res Lett.

Ishai, P., Talary, M., Caduff, A., Levy, E. & Feldman, Y., (2013) *Electrode polarization in dielectric measurements: a review*, Meas. Sci. Technol. 24 *102001* (21pp).

# CURRENT STATUS AND FUTURE DIRECTIONS OF RENEWABLE ENERGY SOURCES IN SPAIN

### Claudia Herrera Quintero

University of Huelva, Spain E-mail: claudiahe2000@gmail.com

**Prof. Nicolay Mihailov, PhD** Department of Electrical Power Engineering "Angel Kanchev" University of Ruse

E-mail: *mihailov@uni-ruse.bg* 

**Abstract:** The paper describe the energy mix of the different type of renewable energy sources in Spain. The focus is on the current situation with application of photovoltaics as well as the future trends. The risks and barriers for implementing of PV parks are explained. Short-term forecasts are presented regarding the development of the PV energy production.

*Keywords:* photovoltaic energy, energy mix, forecast *JEL code:* L60

### REFERENCES

Boyadzhieva, A. et al. (2021) Analysis of the Efficiency of a Stand-Alone PV System for Powering of a Detached House in the Village of Nikolovo, Bulgaria. 2021 International Conference on Applied and Theoretical Electricity (ICATE).

Sarhan, A., et al. (2019) An Improved Numerical Optimization Algorithm for Sizing and Configuration of Standalone Photo-Voltaic System Components in Yemen. Renewable Energy, 134, 1434–1446.

Iqbal, A., and Tariq Iqbal, M. (2019) *Design and Analysis of a Stand-Alone PV System for a Rural House in Pakistan*. International Journal of Photoenergy, 2019, pp. 1–8.

Morshed, Md. S., et al. (2015) *Designing of a 2KW Stand-Alone PV System in Bangladesh Using Pvsyst, Homer and Solarmat.* 2015 3rd International Conference on Green Energy and Technology (ICGET).

### FRI-2G.303-1-CCT1-01

## THE HOBBY TIME TRAINING APPROACH

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

Department of Computer Systems & Technologies, University of Ruse "Angel Kanchev" Phone: +359 877 303 850 E-mail: mil@ieee.org

**Abstract:** Constructivism asserted that learning arises from building mental models based on experience. The concept of Developer's point of view (DPV) learning approach is considered as "perceive the very solution to the problem as a game", thus, making transition to a next level of gamification.

The paper introduces the Hobby Time Training (HTT) concept as part of the DPV learning approach. The HTT assumes solving of small, apparently simple problems, which encapsulates deeply hidden potential. The solving takes place during the students' free time and assumes unobtrusive guidance with as little as possible obligatory moments.

Bitwise operations contain the sought-after hidden creative potential, mainly due to the limited support both at the high and low levels. Besides that, bitwise algorithms suppose usage of some special techniques as word-level parallelism, unrolling loops and branch elimination. As an illustration of the hidden deep inner content of the bitwise problems, the attention is focused on the computing parity bit problem. Several sample solutions are discussed: from the Naïve Algorithm, through the Word-Level Parallelism Algorithms to the Hardware Supported Algorithm.

*Keywords:* Bitwise, Constructivism, Gamification, Hobby Time, x86/x64, Word-Level Parallelism *ASJC Codes:* 1701, 1708, 1712

#### REFERENCES

[1] Anderson, S. Bit Twiddling Hacks. Retrieved September 17, 2022 from *http://graphics.stanford.edu/~seander/bithacks.html#ParityParallel* 

[2] Embarcadero. RAD Studio Docwiki: C++ Compilers. Retrieved September 23, 2022 from *https://docwiki.embarcadero.com/RADStudio/Alexandria/en/C%2B%2B\_Compilers* 

[3] Intel. (2022). Intel® 64 and IA-32 Architectures Optimization Reference Manual. Order Number: 248966-045

[4] Intel. (2022). Intel® 64 and IA-32 Architectures Software Developer's Manual. Order Number: 325462-077US

[5] Hadjerrouit, S. (2005). Constructivism as Guiding Philosophy for Software Engineering Education. ACM SIGCSE Bulletin, Vol. 37, Num. 4. DOI: *https://doi.org/10.1145/1113847.1113875* 

[6] Knuth, D. (2009). The Art of Computer Programming, Volume 4, Fascicle 1: Bitwise Tricks & Techniques; Binary Decision Diagrams. 1st Ed. AddisonWesley Professional. ISBN 978-0321580504

[7] Loukantchevsky, M. Hobby Time: Bit Order Reversal. Retrieved September 21, 2022 from *https://t.me/c/1569632971/106* 

[8] Loukantchevsky, M. (2021) Solving Classical Problem in New Context as Constructive Model of Training: Active Memory Array of Concurrent Processes Concept. IN: CompSysTech '21, New York, NY, USA, ACM, , pp. 191-195, *https://doi.org/10.1145/3472410.3472430* 

[9] Microsoft technical documentation. x86 Instructions. Retrieved September 17, 2022 from *https://docs.microsoft.com/en-us/windows-hardware/drivers/debugger/x86-instructions* 

[10] Warren, H. Hacker's Delight. 2nd Ed. Addison-Wesley Professional. ISBN 978-0321842688

## PARKING GUIDANCE CASES ADAPTATION

### Neyko Neykov - PhD Student

Department of Computer Science, University of Ruse "Angel Kanchev" E-mail: vnneykov@uni-ruse.bg

Assoc. Prof. Svetlana Stefanova, PhD Department of Computer Science, University of Ruse "Angel Kanchev" E-mail: sstefanova@ecs.uni-ruse.bg

**Abstract:** Guidelines generated by Parking guidance information systems (PGIS) are typical examples of activity planning, and therefore can be implemented with Case-Based Reasoning (CBR) methodology. Collective experience utilization in finding free parking spaces improves decision quality. Previously identified cases for solving a parking problem rarely fully satisfy drivers' needs, especially when variety and the amount of attributes in the case description are large. In such scenarios, some or all case parameters need to be adapted to be useful when handling a particular new problem. When using CBR for the purposes of PGIS, there are specifics in case presentation and adaptation when building a solution for the main problem solved by such a system - successful finding of free parking space.

Keywords: Parking Guidance Systems, Case-Based Reasoning, Adaptation

### REFERENCES

Hanney, K., & Keane, M. T. (1997). The adaptation knowledge bottleneck: How to ease it by learning from cases. In *Case-Based Reasoning Research and Development* (pp. 359–370). Springer Berlin Heidelberg. http://dx.doi.org/10.1007/3-540-63233-6\_506

Jalali, V., Leake, D., & Forouzandehmehr, N. (2017, August). Learning and applying case adaptation rules for classification: An ensemble approach. *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence*. http://dx.doi.org/10.24963/ijcai.2017/685

Kisby, C. (2021). Do CDH Network Models Perform CBR Adaptation? An Audit. 1-4.

Mitra, R., & Basak, J. (2005). Methods of case adaptation: a survey. *International Journal of Intelligent Systems*, 20(6), 627–645. https://doi.org/10.1002/int.20087

Petrovic, S., Khussainova, G., & Jagannathan, R. (2016). Knowledge-light adaptation approaches in case-based reasoning for radiotherapy treatment planning. Artificial Intelligence in Medicine, 68, 17–28. https://doi.org/10.1016/j.artmed.2016.01.006

Policastro, C. A., Carvalho, A. C. P. L. F., & Delbem, A. C. B. (2003). Hybrid approaches for case retrieval and adaptation. In KI 2003: Advances in Artificial Intelligence (pp. 297–311). Springer Berlin Heidelberg. http://dx.doi.org/10.1007/978-3-540-39451-8\_22

Richter, M. M., & Weber, R. O. (2013). *Case-Based reasoning: a textbook*. Springer Science & Business Media.

Ye, X., Leake, D., Jalali, V., & Crandall, D. J. (2021). Learning adaptations for case-based classification: a neural network approach. In *Case-Based Reasoning Research and Development* (pp. 279–293). Springer International Publishing. http://dx.doi.org/10.1007/978-3-030-86957-1\_19

## SPEECH RECOGNITION IN ANDROID SERIOUS GAME

#### Ivan Ralev – PhD Student

Department of Computer System and Technology, University of Ruse "Angel Kanchev" Tel.: +359 082 888 596 E-mail: iralev@uni-ruse.bg

### Prof. Georgi Krastev

Department of Computer System and Technology, University of Ruse "Angel Kanchev" Tel.: +359 082 888 672 E-mail: geork@uni-ruse.bg

**Abstract:** The paper describes a developed serious game using speech recognition as a means of control and communication with the player. a brief overview of the importance of using an intelligent human computer interaction is carried out. The difference between voice and speech recognition is explained. The fields of application of this type of communication are described. The mechanics of the implemented game, the result of its testing, the problems encountered and its future development are discussed. The importance and benefit of using serious games developed for Android smart phones is explained.

Keywords: Human computer interaction, serious game, speech recognition JEL Codes: L86

### REFERENCES

Nassif A. B., I. Shahin, I. Attili, M. Azzeh and K. Shaalan. (2019) Speech Recognition Using Deep Neural Networks: a Systematic Review. IEEE Access, vol. 7, pp. 19143-19165, 2019, doi: 10.1109/ACCESS.2019.2896880.

Dimitriadou, A., Djafarova, N., Turetken, O., Verkuyl, M., & Ferworn, A. (2021). Challenges in Serious Game Design and Development: Educators' Experiences. Simulation & Gaming, 52(2), 132–152. *https://doi.org/10.1177/1046878120944197* 

Ted Hagos, (2019), Android Studio IDE Quick Reference: a Pocket Guide to Android Studio Development, apress, ISNB-13(pbk):978-1-4842-4952-9, ISBN-13(electronic):978-1-4842-4953-6 http://doi.org/10.1007/978-1-4842-4953-6

Zhao R., K. Wang, R. Divekar, R. Rouhani, H. Su and Q. Ji. (2018) An Immersive System with Multi-Modal Human-Computer Interaction. 13th IEEE International Conference on Automatic Face & Gesture Recognition (FG 2018), 2018, pp. 517-524, doi: 10.1109/FG.2018.00083.

# RESEARCH AND ANALYSIS OF PRACTICAL TRAINING AFTER COVID-19 WITH STUDENTS OF SPECIALTY "COMPUTER SYSTEMS AND TECHNOLOGIES"

### 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 paper examines and analyses student opinions of the practical training provided following a return to attendance after the restrictions resulting from the COVID-19 pandemic. for the previous two years, the practical training was conducted in an isolated emergency setting, while in 2022 it was conducted in a normal working environment - in person. to find the optimal scenario for the practical training of students from the "Computer Systems and Technologies" specialty, it is necessary to follow the development of the training process in constrained and inperson settings. Researching student feedback is one approach to achieving better results. The report presents the survey results about the practical training conducted with the "Computer Systems and Technologies" students during this period was monitored. The questions in the survey include the students' opinions on the organization of the practical training of the topics and tasks, and the participation of students, lecturers, and specialists from the training organization in it. We receive useful feedback on how to assess the skills acquired during the practical training and what knowledge and skills will be useful to future engineers so that they can be included in the training to facilitate their realization in the work market. The formulated conclusions provide guidelines for the development of practical training and work.

*Keywords: Practical Training, e-learning, Distance Learning, Survey JEL Codes: 120, C88* 

#### REFERENCES

Yordanov, L.,(2015). Analysis of Combined Learning in Discipline 'Introduction to Communications and Computer Technologies', *International Conference on e-Learning'15*, 11-12 September 2015, University of Applied Sciences, Berlin, Germany, 2015, pp. 125-129, ISBN 2367-6698

Yordanov L., (2020). Results of Done E-Learning in the Conditions of Covid, *Proceedings Volume 59, book 3.2. Communication and Computer Technologies, Ruse, 11-13 November 2020*, pp 18-23, ISSN 2603-4123.

Yordanov L., (2021). Observation of the Practical Training with the Students of Specialty Computer Systems and Technologies, *Proceedings of University of Ruse - 2021, vol. 60, book 3.2, Ruse, 28-30 October 2021, ISSN: 1311-3321* 

## DIGITIZATION OF BUSINESS PROCESSES IN THE WAREHOUSE

#### Assistant Prof. Tsvetelina Mladenova, PhD

Department of Computer Systems and Technologies, University of Ruse, Ruse, Bulgaria E-mail: tsmladenova@uni-ruse.bg

#### Assoc. Prof. Irena Valova, PhD

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

**Abstract:** This paper examines some key warehouse business processes from the point of view of their potential for automation and digitization. Different types of data sources are analyzed – accounting documents and forms, business correspondence, predictive analytics, data from IoT devices. Data from these sources, in turn, can be of different types and require different methods and means of collection, organization, storage and processing. The protocols for the exchange of the various types of data are consider. All these are done with the idea about the automatic extraction of useful information for the warehouse from collected data with the aim of automating as many business processes as possible with the help of software solutions.

*Keywords:* business process modeling, data collection, data analysis algorithms *JEL Codes:* L10, L11

#### REFERENCES

Abouzid, I., Bekali, Y. K., & Saidi, R. (2022). Modelling IoT Behaviour in Supply Chain Business Processes with BPMN: a Systematic Literature Review. *Journal of ICT Standardization*, 439-468.

Compagnucci, I., Corradini, F., Fornari, F., Polini, A., Re, B., & Tiezzi, F. (2020, September). Modelling notations for IoT-aware business processes: a systematic literature review. In *International Conference on Business Process Management* (pp. 108-121). Springer, Cham.

Thomas, D. M., & Mathur, S. (2019, June). Data analysis by web scraping using python. In 2019 3rd International conference on Electronics, Communication and Aerospace Technology (ICECA) (pp. 450-454). IEEE.

Karthikeyan, T., Sekaran, K., Ranjith, D., & Balajee, J. M. (2019). Personalized content extraction and text classification using effective web scraping techniques. *International Journal of Web Portals (IJWP)*, *11*(2), 41-52.

Mitchell, R. (2018). *Web scraping with Python: Collecting more data from the modern web*. " O'Reilly Media, Inc.".

# TEACHING CRYPTOGRAPHY AND DATA SECURITY: SIMPLIFIED MD4 HASH FUNCTION

#### Assist. Prof. Emilia Golemanova, PhD

Department of Computer Systems and Technologies, "Angel Kanchev" University of Ruse Tel.: 082-888-681 E-mail: EGolemanova@uni-ruse.bg

Assist. Prof. Tzanko Golemanov, PhD

Department of Computer Systems and Technologies, "Angel Kanchev" University of Ruse Tel.: 082-888-681 E-mail: TGolemanov@uni-ruse.bg

**Abstract:** Cryptographic hash functions are data integrity algorithms used in a variety of security applications like message authentication, digital signatures, one-way password files, intrusion detection, and virus detection. Although the SHA algorithms (inspired by the MD family) are the most widely used hash functions nowadays, teaching the MDx algorithm first is an approach adopted in most Cryptography and Data Security courses. The paper describes the teaching process of MD4 at the department of Computer Systems and Technologies of Ruse University. MD4 algorithm lays the foundation for several other popular hash functions like MD5, SHA-1, SHA-2, and RIPEMD. Due to the large number of operations in the full MD4, a simplified version suitable for students to work with by hand in a classroom setting is used. The authors present an especially developed educational tool for better apprehending simplified MD4.

Keywords: Cryptography, Hash function, MD4, Teaching tool

#### REFERENCES

Bosselaers, A. &. (1995). Integrity Primitives for Secure Information Systems: Final Ripe Report of Race Integrity Primitives Evaluation (No. 1007). Springer Science & Business Media.

Dobbertin, H. B. (1996). RIPEMD-160: a strengthened version of RIPEMD. *Fast Software Encryption. FSE 1996* (pp. 71–82). Cambridge, UK, February : Springer, Berlin, Heidelberg.

Holden, J. (2013). a Good Hash Function is Hard to Find, and Vice Versa, Cryptologia. *Cryptologia*, 37(2), 107-119.

*MD4 Hash Generator*. (2022). Retrieved from xhcode: https://www.xhcode.com/md4-hash-generator.html

National Institute of Standards and Technology. (1995). *Secure Hash Standard, FIPS PUB* 180-1. Washington: National Institute of Standards and Technology, U.S. Department of Commerce.

National Institute of Standards and Technology. (2001). *Secure Hash Standard, FIPS 180-2*. Washinton: National Institute of Standards and Technology.

Network Working Group. (1990, October). The MD4 Message Digest Algorithm, RFC1186. Retrieved from https://www.rfc-editor.org/rfc/rfc1186

Network Working Group. (1992, April). The MD5 Message-Digest Algorithm, RFC 1321. Retrieved from https://datatracker.ietf.org/doc/html/rfc1321

*Online hash calculation MD4 Algorithm*. (2022, october 17). Retrieved from conversion-tool: https://www.conversion-tool.com/md4/

*Online MD4 Generator*. (2022). Retrieved from Free Online File Converter: https:// hash.online-convert.com/md4-generator

Online MD4 Hash Calculator. (2022, october 17). Retrieved from Md5Calc: https://md5calc.com/hash/md4

## **TEACHING OPERATING SYSTEMS: MEMORY MANAGEMENT**

#### Tzanko Golemanov, PhD

Department of Computer Systems and Technologies, "Angel Kanchev" University of Ruse Tel.: +359 82 888 681 E-mail: TGolemanov@uni-ruse.bg

#### Emilia Golemanova, PhD

Department of Computer Systems and Technologies, "Angel Kanchev" University of Ruse Tel.: +359 82 888 681 E-mail: EGolemanova@uni-ruse.bg

Abstract: Operating System (OS) is probably the most complex software ever created by humans and the Operating Systems course is an essential component in Computer Science (CS) curricula and related majors. We, as CS educators, aim for every student to get an inside view of the structure and functioning of an operating system, and using appropriate teaching tools is an essential point in achieving this goal. In this paper, we would like to share our experience in teaching OS Memory Management using the TOST (Teaching in Operating System Tool) environment. TOST enables students to run several processes and to observe the allocation of memory blocks, both in contiguous and non-contiguous memory allocation (virtual memory paging). Students can alternate several contiguous allocation strategies or several page replacement strategies. It is possible to trace the addressing in virtual memory pages and the conversion of virtual addresses to real ones. The dynamic visualization of the memory allocation map makes it easy for the instructor to clarify the principles of locality - Temporal locality and Spatial locality. The ability to experiment with both theoretical concepts and their application in the same environment allow students to gain a better apprehending of the algorithms of OS modules.

Keywords: Operating Systems, Teaching Tools, Memory Management, Virtual Memory

#### REFERENCES

Bays, C. (1977) 'A comparison of next-fit, first-fit, and best-fit', *Communications of the ACM*, 20(3). doi: 10.1145/359436.

Deitel, H. M., Deitel, P. J. and Choffnes, D. R. (2004) *Operating systems*. Pearson/Prentice Hall.

Golemanov, T. and Golemanova, E. (2006) 'A Teaching in Operating Systems Tool', in *CompSysTech'06*.

Silberschatz, A., Galvin, P. B. and Gagne, G. (2013) *Operating System Concepts*. 9. John Wiley & Sons, Inc.

Tanenbaum, A. S. and Bos, H. (2016) *Modern Operating Systems, Education*. Pearson India; 4th edition.

Wilson, P.R., Johnstone, M.S., Neely, M., Boles, D. (1995) 'Dynamic storage allocation: a survey and critical review', in *International Workshop on Memory Management IWMM 95*. Kinross, UK. doi: 10.1007/3-540-60368-9\_19.

# ANALYSIS OF TRENDS IN DATA GATHERED BY A PERSONALIZED LEARNING PATH TRACKING SYSTEM FOR DOCTORAL STUDENTS

#### Assist. Prof. Pavel Zlatarov, MSc

Department of Computing, "Angel Kanchev" University of Ruse Tel.: 082 888 855 E-mail: pzlatarov@uni-ruse.bg

### Assoc. Prof. Galina Ivanova, PhD

Department of Computing, "Angel Kanchev" University of Ruse Phone: 082 888 855 E-mail: giivanova@uni-ruse.bg

**Abstract:** The paper reviews methods for statistical analysis of data gathered and generated by a personalized learning path tracking system intended for use by doctoral students, their scientific advisors, and administrative personnel in an academic institution. with personalized learning growing in popularity, similar systems are increasingly being implemented by educators and educational institutions at all levels, so analyzing their efficiency and efficiences becomes more and more important. The methodology and toolset used for the analysis are shown, the results analysed, and conclusions drawn from an experiment that spanned several years of usage of the system.

*Keywords:* Personalized learning path, doctoral students, data analysis *JEL Codes:* C88

## REFERENCES

Ferrão, M. E. (2020). *Statistical methods in recent higher education research*. Journal of College Student Development, 61(3), 366-371.

Kitto, K., Williams, C., & Alderman, L. (2019). *Beyond Average: Contemporary statistical* techniques *for analysing student evaluations of teaching*. Assessment & Evaluation in Higher Education, 44(3), 338-360.

Zlatarov, P., Ivanova, G., Ibryamova, E., & Baeva, D. (2018). a user-centered software system for admission optimization and education process management for Ph. D. students. In The International Scientific Conference eLearning and Software for Education (Vol. 2, pp. 144-151). "Carol I" National Defence University.

Carpenter, J. (2012). *Researchers of Tomorrow: The research behaviour of Generation Y doctoral students*. Information Services & Use, 32(1-2), 3-17.

Jazvac-Martek, M., Chen, S., & McAlpine, L. (2011). *Tracking the doctoral student experience over time: Cultivating agency in diverse spaces*. In Doctoral education: Research-based strategies for doctoral students, supervisors and administrators (pp. 17-36). Springer, Dordrecht.

Zlatarov, P., Ivanova, G., & Baeva, D. (2019, May). a *web-based system for personalized learning path tracking of doctoral students*. In 2019 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO) (pp. 773-778). IEEE.

Zlatarov, P., Ivanova, G., Baeva, D., & Antonova, D. (2018, September). Adaptive Software System for Optimization of the Admission and Management Process for Doctoral Students. In Proceedings of the Computational Methods in Systems and Software (pp. 323-332). Springer, Cham.

## EDUCATIONAL COMPUTER PLATFORMS THAT IMPROVE LOGICAL THINKING WITH PROGRAMMING: AN OVERVIEW

Princ. Assist. Elitsa Ibryamova, PhD Department of Computer Systems and Technologies University of Ruse "Angel Kanchev" Phone: 082 888-827 E-mail: Elbryamova@ecs.uni-ruse.bg

**Abstract:** The paper reviews existing methods of developing computational and logical thinking at an early age by learning to code. Educational computer platforms that help children in programming are tools designed to address the challenges of education. their primary function is self-interaction with the user, emphasizing accelerated learning of skills outside the learning process. Still, they can be instrumental in classrooms as well. The idea is to develop not only coding skills but also to give learners a new approach to developing their imaginations while creating virtual art, games, or worlds. The report provides the most recent advancements in these educational computer programs, including a comparative analysis of programming environments designed for children.

*Keywords:* Logic, Computational Thinking, STEM, STEAM, Computer Games, Computer Program, Programming, Coding *JEL Codes: L10*, *L11* 

#### REFERENCES

Bakala, E., Gerosa, A., Hourcade, J. P., Pascale M., Hergatacorzian, C., & Tejera G. (2022). Design Factors Affecting the Social Use of Programmable Robots to Learn Computational Thinking in Kindergarten. In Interaction Design and Children (IDC '22). Association for Computing Machinery, New York, NY, USA, 422–429. *https://doi.org/10.1145/3501712.3529745*.

Hintikka, J. J. (2020). "applied logic". Encyclopedia Britannica, 29 Jul. 2020, https://www.britannica.com/topic/applied-logic. Accessed 10 October 2022.

Larkin, K., Lommatsch, C., Resnick, I., & Lowrie, T. (2022). The design and use of a digital tool to support the development of preschool children's logical reasoning. Journal of Research on Technology in Education, 1-14.

Milková, E., & Hùlková, A. (2013). Algorithmic and logical thinking development: Base of programming skills. 12. 41-51.

Oljayevna, O., & Shavkatovna, S. (2020). The Development of Logical Thinking of Primary School Students in Mathematics. European Journal of Research and Reflection in Educational Sciences, 8(2), 235-239.

Papadakis S. (2021). The Impact of Coding Apps to Support Young Children in Computational Thinking and Computational Fluency. a Literature Review. Frontiers in Education, 6, art. no. 657895.

Yu, J. & Roque, R. (2019). a review of computational toys and kits for young children. International Journal of Child-Computer Interaction 21 (Sept. 2019), 17–36. https://doi.org/10.1016/j.ijcci.2019.04.001

Yunus, Y. S. (2021). Features of Logical Thinking of Junior Schoolchildren. Middle European Scientific Bulletin, 10.

# RESTORE AN OPERATING SYSTEM FROM RANDOM BACKUP DISK IMAGE

Eng.Vladislav Hinkov, PhD student Department of computing "Angel Kanchev" University of Ruse Phone: +359 884 260 685 E-mail: vhinkov@uni-ruse.bg

Abstract: The paper reviews a way to bring a computer system into working readiness, with the return of an arbitrary image of an operating system made on an unknown computer. Specific backup and recovery software environments are used, and specific points and processes are reviewed. It shows how essential drivers can be injected to initialize the operating system, as well as its subsequent reconfiguration for normal operation. Thei are shown the main advantages and disadvantages of the used backup and restore software environments.

*Keywords:* Effectiveness, automated software installation, software implementation, process control *JEL Codes:* L86

#### REFERENCES

Halsey, M. (2022). Configuring Windows 10. In: Windows 10 Troubleshooting. Apress, Berkeley, CA. *https://doi.org/10.1007/978-1-4842-7471-2\_3* 

https://appsofthub.com/best-cloning-software/

Руководство пользователя Paragon Backup & Recovery [Электронный ресурс].- Режим доступа: https://download.paragon-software.com/doc/BRl 5Home \_ ru \_ manual.pdf? tracking=cj&x-aff=cj&x-cjevent=c917603dfЪ51 l leb8189549b0a18050d. - Дата доступа: 17.06.2021.

Halsey, M. (2022). Building a Safe and Secure OS. In: Windows 10 Troubleshooting. Apress, Berkeley, CA. *https://doi.org/10.1007/978-1-4842-7471-2\_2* 

https://www.acronis.com/en-us/blog/posts/power-user-insights-advanced-winpere-driver-injection-acronis-media-builder/

https://quantumwarp.com/kb/articles/94-windows-10/772-convert-windows-10-mbr-system-disk-to-a-gpt-hard-drive-type

# A WEB-BASED LEARNING ENVIRONMENT WITH INTERACTIVE TIMELINE TO SUPPORT SELF-STUDY IN HISTORY

#### Assoc. Prof. Aneliya Ivanova, PhD

Department of Computer Systems and Technologies, University of Ruse "Angel Kanchev" Phone: 082-888 827 E-mail: aivanova@uni-ruse.bg

#### Radostin Kostadinov, BSc.

Department of Computing, University of Ruse, Bulgaria E-mail: bg.radostin.kostadinov@gmail.com

Abstract: History teaching has always met its specific challenges, but with the ever-expanding digitalization in all areas of human activity, increasingly dependent by the digital technology students appear in the classroom, for whom the classical approach to learning history is completely alien. We can hardly imagine the modern student in the library, researching a plenty of sources, taking notes, analyzing and formulating conclusions. The timeline is a well-known tool for history teachers to visualize the chronology of historical events and to direct students' attention to specific events, people, and places. with the advancement of web technologies, the latter is increasingly used in an interactive digital online format, but it cannot yet be said that its potential as a means of effective self-training has been fully realized. This paper examines the process of design and development of a web-based environment with an interactive timeline operating in three modes that support the main stages of self-training - acquisition, assimilation and application of knowledge. The environment has an administrative panel, which enables the teacher to construct a hierarchical structure of historical eras and periods and create and fill with content interactive timelines associated with hierarchy's elements. The panel also supports the management of the published learning resources, the user registrations, monitoring the achievements and progress of the learners, as well as organizing online competitions between the students.

*Keywords:* Interactive Learning Environment, Interactive Timeline, Innovative Learning, Self-preparation, History Education *JEL Codes:* 121

## REFERENCES

Hollis, R. B., Was, C. A. (2016). Mind wandering, control failures, and social media distractions in online learning. Learning and Instruction, Volume 42, 2016, Pages 104-112, https://doi.org/10.1016/j.learninstruc.2016.01.007.

National Research Council 2005. How Students Learn: History in the Classroom. Washington, DC: The National Academies Press. https://doi.org/10.17226/11100.

Fielding, J. (2005). Engaging Students in Learning History. Canadian Social Studies Volume 39 Number 2, Winter 2005

Picard, D., & Bruff, D. (2016). Digital Timelines. Vanderbilt University Center for Teaching, 2016.

Stoycheva, V., Ivanova, V. (2011). Adult Education and Interactive Training in History of Balkans, Epohi Journal, vol. 1, MMXI.ISSN 1310-2141, COBISS.BG-ID –1251977700, с. 169–190. (**Оригинално заглавие:** Стойчева, В, В. Иванова (2011). "Образованието за възрастни и интерактивното обучение по история на Балканите". Списание Епохи, В. Търново: УИ "Св. св. Кирил и Методий", кн. 1, MMXI.ISSN 1310-2141, COBISS.BG-ID –1251977700, с. 169–190.

# LEARNING VHDL USING THE CONCEPT OF VISUAL PROGRAMMING

#### Assoc. Prof. Aneliya Ivanova, PhD

Department of Computer Systems and Technologies, University of Ruse "Angel Kanchev" Phone: 082-888 827 E-mail: aivanova@uni-ruse.bg

#### Venelin Mandov, MSc.

Department of Computing, University of Ruse, Bulgaria E-mail: venelinmandov98@gmail.com

### Principal Assistant Nikolay Kostadinov, PhD

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

Abstract: When the students studying programmable logic design have to learn a hardware description language (HDL) in order to implement their projects, they usually meet several challenges. The first one of them is due to the development environments for HDLs which are usually designed for highly trained professionals and could be complicated as an introductory tool for students learning HDLs. The next challenge is for the students to start thinking in terms of hardware when writing HDL code, and have in mind that each HDL structure models a digital device. The further challenge is for the students to get used to think in terms of signals, ports and processes running parallel to each other, rather than of variables, methods and functions. HDLs are compiled to a RTL structure, which requires a logically justified construction of the code, describing the behavior of the modelled device. In this paper is presented the process of design and development of a training environment that uses the visual programing concept to help the students to become familiar with the structure and hierarchy of the VHDL models. The students construct VHDL models by selecting and asembling together simple visual objects, while the environment is providing guidance in real time and is preventing wrong matches of VHDL operators and signals. The visual programming approach has been chosen because the digital students as a whole have visual-kinaesthetic learning style and most of them are familiar with visual programming tools, such as Scratch and Kudo from IT classes at school. The environment prompts the student to select a template from a library, thus avoiding inconsistent structures and combinations of devices in the project. When a template is selected, the "Visual Components" panel of the environment displays only the appropriate visual components, which correspond to the template. After the visual structure is assembled correctly, the student is offered to start its' conversion to VHDL code. The output VHDL code is saved as a .vhd file and can be further open with any IDE supporting VHDL.

Keywords: Hardware Description Language, VHDL, Interactive Learning Environment, Visual Programming JEL Codes: 121, 123

#### REFERENCES

Kumar, A., R. C. Panicker, A. Kassim. (2013). *Enhancing VHDL learning through a light-weight integrated environment for development and automated checking*. Proceedings of 2013 IEEE International Conference on Teaching, Assessment and Learning for Engineering, pp. 570-575. doi: 10.1109/TALE.2013.6654502.

Godofredo, R. G., A. Tchernykh, A. Yu. Drozdov, S. N. Garichev, S. Nesmachnow, M. Torres-Martinez. (2019). *Visualization of VHDL-based simulations as a pedagogical tool for supporting computer science education*. Journal of Computational Science, Volume **36**, doi: 10.1016/j.jocs.2017.04.004.

Jelemenska, K., P. Cicak, M. Gazik. (2016). *VHDL models e-assessment in Moodle environment*. International Conference on Emerging eLearning Technologies and Applications (ICETA), Vysoke Tatry, pp. 141-146, doi: 10.1109/ICETA.2016.7802048.
Seraj, M., S. Autexier, J. Janssen. (2018). *BEESM, a block-based educational programming tool for end users*. In Proceedings of the 10th Nordic Conference on Human-Computer Interaction (NordiCHI '18). Association for Computing Machinery, New York, NY, USA, 886–891. doi: 10.1145/3240167.3240239

Pinto-Llorente, A.M., S. Casillas-Martín, M. Cabezas-González, et al. (2018). *Building, coding and programming 3D models via a visual programming environment*. Qual Quant 52, 2455–2468. doi: 10.1007/s11135-017-0509-4

Baldwin, L. P., J. Kuljis. (2000). *Visualisation techniques for learning and teaching programming*. ITI 2000. Proceedings of the 22nd International Conference on Information Technology Interfaces (Cat. No.00EX411), Pula, Croatia, pp. 83-90, doi: 10.2498/cit.2000.04.03.

Carlisle, M. C., T. A. Wilson, J. W. Humphries, S. M. Hadfield. (2005). RAPTOR: a visual programming environment for teaching algorithmic problem solving. SIGCSE Bull. **37**, **1**, pp.176–180. doi: 10.1145/1047124.1047411

#### FRI-2G.302-1-CCT2-01

# INTERNET TRAFFIC ANALYSIS BY ANFIS, K-NEAREST NEIGHBORS AND DECISION TREE APPROACH

#### Assoc. Prof. Ivelina Balabanova, PhD

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

#### Eng. Teodora Zhorova, PhD Student

Department of Communications Equipment and Technologies, Technical University of Gabrovo Phone: 08998 690 061 E-mail: teddy.tedun@gmail.com

### Chief Assist. Prof. Georgi Georgiev, PhD

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

Abstract: The paper examines the applicability of Adaptive neural-fuzzy interface systems and k-Nearest Neighbors and Decision tree machine learning techniques in recognizing of areas of streaming Internet traffic from enterprise customers. The combined approach enables a process synthesis of different types of classifiers and selection of the most suitable analytical tool for traffic zone identification. An assessment of the RMSE criteria for different membership functions of the input variables at Hybrid and Backpropagation algorithms was evaluated about the neuro-fuzzy classifier. Synthesis of k-NN and decision tree classification models using resubstitution and cross validation techniques about accuracy and loss indicators was performed. Satisfactory persormance indices have been established in the course of training and testing procedures about ANFIS, k-NN and DT classifiers. The investigations are conducted with MATLAB and STATISTICA software products.

*Keywords:* traffic analysis, anfis, RMSE, k-NN, decision tree, resubstitution, cross-validation. *JEL Codes:* L10, L11

#### REFERENCES

Chastikova, V., & Sotnikov, V. (2019). Method of analyzing computer traffic based on recurrent neural networks. *IOP Publishing, Journal of Physics*, 1353, 1-6.

Krupski, J., Graniszewski, W., & Iwanowski, M. (2021). Data transformation schemes for CNN-based network traffic analysis: a survey. Electronics, 10, 1-35.

Siracusano, G., Galea, S., Sanvito, D., Malekzadeh, M., Antichi, G., & Costa, P. (2022). *Rearchitecting traffic analysis with neural network interface cards*. Paper presented at the 19th USENIX Symposium on Networked Systems Design and Implementation, 4<sup>th</sup>-6<sup>th</sup> April 2022, Washington.

Ciptaningtyas, H., Fatichah, Ch., & Sabila, A. (2016). *Network traffic anomaly prediction using artificial neural network*. Paper presented at the Engineering International Conference, 5<sup>th</sup>-6<sup>th</sup> October 2016, Semarang.

Saber, M., Farissi, I., Chadli, S., & Emharraf, M. (2017). Performance analysis of an intrusion detection systems based on artificial neural network. *Advances in Intelligent Systems and Computing*, 5(52), 511-521.

Ilyas, M., & Alhabri, S. (2022). Machine learning approaches to network intrusion detection for contemporary internet traffic. *Computing*, 104(1), 1-16.

Antunes, M., Oliveira, L., Seguno, A., Verissimo, J., Salgado, R., & Murteira, T. (2022). Benchmarking deep learning methods for behaviour-based network intrusion detection. *Informatics*, 9(29), 1-18.

# WIRELESS MICROWAVE TRANSPORT SOLUTIONS ACCOMMODATE DIFFERENT CHARACTERISTICS AND REQUIREMENTS TO SUIT POSSIBLE 5G SCENARIOS

#### Assoc. Prof. Teodor Iliev, PhD

Telecommunications Department, "Angel Kanchev" University of Ruse Phone: 082-888 839 E-mail: tiliev@uni-ruse.bg

#### Ivelin Penkov, M.Eng.

Telecommunications Department, "Angel Kanchev" University of Ruse Tel.: +359 88 3299777 E-mail: Ivelin.r.penkov@gmail.com

**Abstract:** to meet the 5G requirement for more capacity, new microwave solutions for optimizing the use of spectrum are now available. Carrier aggregation (using multiple bands on the same link), more powerful and efficient power amplifiers that enable the use of wider channels and the availability of millimeter-wave spectrum provide key functions for future network solutions.

For example, in today's frequency bands used for RAN backhaul (6-42 GHz), several vendors can provide transceivers capable of 2.5 Gbps in a single box (thanks to 4096 QAM modulation schemes in 2 x 112 MHz frequency channels).

Beyond this, current E-Band (80 GHz) based solutions stand ready to satisfy the initial wave of 5G introductions that require up to 10 Gbps transport capacity and 20 microsecond latency in urban environments. by combining E-Band with a traditional microwave frequency band (6-42 GHz), it is possible to achieve longer distances and preserve the usual high availability for the most valuable traffic. Combined with 100 percent efficient carrier aggregation it is possible to achieve between 10 and 20 Gbps bidirectional capacity. So, in upcoming years it is expected that microwave will be able to support 100 Gbps links using new frequencies and MIMO technology.

Keywords: 5G, RAN, Backhaul, E-Band, XPIC, MIMO, Multi-band.

#### REFERENCES

Hoydis J., E. Bjornson and L. Sanguinetti. (2016). Massive MIMO Networks: Spectral, Energy, and Hardware Efficiency.

Ohlen P., B. Skubic, A. Rostami, M. Fiorani, P. Monti, Z. Ghebretensae, J. Martens-son, K. Wang, and L. Wosinska. (2016). Data plane and control architectures for 5G transport networks," Journal of Lightwave Technology, vol. 34, pp. 1501–1508.

Xiao M., S. Mumtaz, Y. Huang, L. Dai, Y. Li, M. Matthaiou, G. K. Karagiannidis, E. Bjrnson, K. Yang, C. I, and A. Ghosh. (2017). Millimeter wave communications for future mobile networks," IEEE Journal on Selected Areas in Communications, vol. 35, pp. 1909–1935.

M. Fiorani, B. Skubic, J. M<sup>°</sup>artensson, L. Valcarenghi, P. Castoldi, L. Wosinska, and P. Monti. (2015) On the design of 5G transport networks," Photonic Network Communications, vol. 30, pp. 403–415.

# IMPROVING ELECTRONICS EDUCATION THROUGH PROJECT-BASED LEARNING

# Assist. Prof. Ventsislav Keseev, PhD

Department of Telecommunications, "Angel Kanchev" University of Ruse Phone: 082-888 831 E-mail: vkeseev@uni-ruse.bg

**Abstract:** The world faces many challenges today and the key to their long term solutions lies in the education systems which are one of the main supporting pillars of all countries. a study on good educational practices was done. The best way to improve engineering education is through a well-organized and well-interconnected educational process that includes practical real-world problem-based and project-based learning approaches and outcome-based exam assessments. Some major problems with the Bulgarian education system are presented from the electronics engineering point of view. An analysis of the possible problem-solving is done. Some suitable practical solutions and approaches are presented, which improve the learning process despite all limitations.

Keywords: Education, Quality, Project, Electronics, Problem.

### REFERENCES

Neamtu, D. (2015). Education, the Economic Development Pillar. *Procedia - Social and Behavioral Sciences*, 180, 413-420.

Rathy, G., Sivasankar, P., & Gnanasambandhan T. (2020). Developing a knowledge structure using Outcome based Education in Power Electronics Engineering. *Procedia Computer Science*, 172,1026-1032.

Amusa, J., (2022). Practical Electronics as a Tool for Enhancing Physics Students' Interest in Learning the Concept of Electricity in Lagos, Nigeria. *International Journal of Educational Research Review*, 2022.

Guo, P., Saab, N., Post, & L., Admiraal, W. (2020). a review of project-based learning in higher education: Student outcomes and measures. *International Journal of Educational Research*, 102, 101586.

Krajcik, J., & Shin, N. (2014). Project-based learning. In R. K. Sawyer (Ed.). *The Cambridge handbook of the learning sciences*, 2, 275–297.

Mohd-Yasin, F. (2021). Effective Strategies for Project-Based Learning of Practical Electronics. *Electronics*, 10(18), 2245.

Díaz-Ramírez, J. (2020). Gamification in engineering education – An empirical assessment on learning and game performance. *Heliyon*, 6(9), e04972.

Hanushek, E., & Wößmann, L. (2007). The Role of Education Quality in Economic Growth. *World Bank Policy Research*, 4122.

Mehmood, U. (2021). Contribution of renewable energy towards environmental quality: The role of education to achieve sustainable development goals in G11 countries. *Renewable Energy*, 178, 600-607.

Hämäläinen, R., De Wever B., Nissinen, K., & Cincinnato, S. (2019). What makes the difference – PIAAC as a resource for understanding the problem-solving skills of Europe's higher-education adults. *Computers & Education*, 129, 27–36.

Weng, H., Chiu, T., & Tsang, Ch. (2022). Promoting student creativity and entrepreneurship through real-world problem-based maker education. *Thinking Skills and Creativity*, 45, 101046.

Meirbekov, A., Maslova, I., & Gallyamova, Z. (2022). Digital education tools for critical thinking development. *Thinking Skills and Creativity*, 44, 101023.

Yusof, Y., Sanusi, H., & Mat, K. (2012). Computer Simulation as Preparation for Electronics Laboratory. *Procedia - Social and Behavioral Sciences*, 60, 397 – 404.

Serafin, C. (2021). Online Tools for Electrical and Electronics Education. *Journal of Education, Technology and Computer Science*, 2(32), 148-153.

Vasileva, T., & Tchoumatchenko, V. (2014). Promoting Knowledge Practices in Electronic Education. *Annual Journal of Electronics*, 2014, 158-161.

# THEORETICAL AND SIMULATION STUDY OF DIGITAL DIFFERENTIATORS AND INTEGRATORS

Assoc. Prof. Adriana Borodzhieva, PhD Department of Telecommunications "Angel Kanchev" University of Ruse

Phone: 00359 888 734 E-mail: aborodzhieva@uni-ruse.bg

**Abstract:** The paper presents the results from the theoretical and simulation study of digital differentiators and integrators. The theory and applications of digital differentiators and integrators are described in the paper. The circuits of the real first-order differentiator, central differentiator, first-order integrator, trapezoidal integrator, and integrator according to Simpson's rule are given in the paper, as well as the expressions of the transfer function and magnitude response of these devices are derived and presented in the paper. The expressions are analyzed and the graphical representations of the magnitude response, impulse response, and zero-pole plot are drawn using MATLAB and its extension Signal Processing Toolbox. The results in the paper are used in the course "Digital Signal Processing", mandatory in the undergraduate curriculum of the specialties "Information and Communication Technologies" (2nd semester) and "Internet and Mobile Communications" (3rd semester).

*Keywords:* digital differentiators and integrators, digital signal processing, MATLAB and Signal Processing Toolbox.

JEL Codes: L96, L63, I23

### REFERENCES

Borodzhieva, A. (2022). Active Learning Used for Teaching the Topic "Design of Finite Impulse Response Filters in MATLAB" in the Course "Digital Signal Processing". Paper presented at IWSSIP 2022, Sofia, Bulgaria, pp. 1-5, doi: 10.1109/IWSSIP55020.2022.9854458.

Borodzhieva, A. (2022). Collaborative Learning for Teaching the Topic "Design of Differentiators and Integrators in MATLAB" in Digital Signal Processing Course. Paper presented at the XXXI International Scientific Conference Electronics – ET2022, Sozopol, Bulgaria (in the press).

Вогоdzhieva, A., & Manoilov, P. (2011). Digital Signal Processing – Exercise Guide. Ruse; Publisher: Avangard Print EOOD, pp. 80 (in Bulgarian). (**Оригинално заглавие:** Бороджиева, А. & Маноилов, П., 2011. Цифрова обработка на сигнали – ръководство за упражнения. Русе: Издателство "Авангард Принт ЕООД", стр. 80.)

Borodzhieva, A., & Tsvetkova, I. *Increasing Students' Motivation in the Course "Digital Signal Processing" Using Active Learning.* Paper presented at the 14th Annual International Conference of Education, Research and Innovation, Seville (Spain), 8–9 November 2021, Proceedings of ICERI2021 Conference, pp. 3192-3201, ISBN: 978-84-09-34549-6.

Воуапоv, В. (2003). Digital Signal Processing – Part I. Varna, BRYAGPRINT-AD, Varna, pp. 406 (in Bulgarian). (**Оригинално заглавие:** Боянов, Б., 2003. Цифрова обработка на сигнали – Част I. Варна: Издателство "Брягпринт-АД", стр. 406.)

Mneney, St. H. (2008). An Introduction to Digital Signal Processing: a Focus on Implementation. River Publishers ApS, Aalborg, Denmark, pp. 284.

Differentiator and Integrator, https://www.tutorialspoint.com/linear\_integrated\_circuits\_applications/linear\_integrated\_circuits\_applications\_differentiator\_and\_integrator.htm (Access: October 2022).

Signal Processing Toolbox<sup>TM</sup> User's Guide. MATLAB, R2019b, 2019, https://es.mathworks.com/help/releases/R2019b/pdf\_doc/signal/signal\_tb.pdf (Access: October 2022).

# APPROACH FOR OPTIMIZING 3D CONTENT FOR VISUALIZATION IN WEB ENVIRONMENTS

#### Assoc. Prof. Georgi Hristov, PhD

Department of Telecommunications "Angel Kanchev" University of Ruse Phone: 0035982 888 663 E-mail: ghristov@uni-ruse.bg

### Eng. Georgi Georgiev, PhD Student

Department of Telecommunications, "Angel Kanchev" University of Ruse Tel.: 082 888 353 E-mail: gdgeorgiev@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

Abstract: The representation of objects, events and phenomena by means of 3D visualization is gaining more and more popularity. The mostly used distribution mediums for 3D content are web-based platforms, which are able to present 3D content in real-time using WebGL. Thanks to this fact, new forms of e-commerce using web-based virtual catalogs have emerged, and some organizations use this opportunity to successfully promote cultural and historical heritage by creating web-based virtual museums and exhibitions. This trend has increased the interest in 3D content that is created via 3D scanning methods based on the use of structured light. As a result of this process, textured 3D digital models of historical artifacts and objects are created. Unfortunately, these digital 3D models cannot be directly integrated for visualization in web-based environments, due to a number of limitations. In this paper, an approach is proposed for optimizing 3D content for visualization in web-based environments and platforms. This approach solves not only the problem of the limited bandwidth available for mobile users, but also the limited GPU power of mobile devices problem.

Keywords: 3D content, 3D scanning, 3D visualization, 3D web environments;

## REFERENCES

Antonaci, Alessandra, Michela Ott, and Francesca Pozzi. (2013). Virtual museums, cultural heritage education and 21st Century skills. Learning & Teaching with Media & Technology 185.

Bendis, Jared E. (2007). Developing educational virtual worlds with game engines." ACM SIGGRAPH 2007 educators' program. ACM.

Kerstena, T. P., F. Tschirschwitza, and S. Deggima. (2017). Development of a Virtual Museum Including a 4d Presentation of Building History in Virtual Reality." ISPRS-International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences (2017): 361-367.

Sylaiou, Stella, et al. (2010) Exploring the relationship between presence and enjoyment in a virtual museum." International journal of humancomputer studies 68.5 (2010): 243-253.

Schweibenz, Werner. (1998) The" Virtual Museum": New Perspectives for Museums to Present Objects and Information Using the Internet as a Knowledge Base and Communication System. ISI 34 (1998): 185-200.

# EXPLORING THE POTENTIAL OF DEVELOPMENT ROBOTIC PLATFORM IN HANDLING DIFFERENT TYPES OF TASKS

### Eng. Georgi Georgiev, PhD Student

Department of Telecommunications, "Angel Kanchev" University of Ruse Tel.: 082 888 353 E-mail: gdgeorgiev@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

### Assoc. Prof. Plamen Zahariev, PhD

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

**Abstract:** Robotic platforms are increasingly entering human daily life. According to their purpose, they replace people in different types of tasks. In this way, human time is saved and the precision of the task is also increased. Most robotic systems created are designed to perform one specific task. with development robotics platforms, the number of tasks that can be performed is unlimited, and what type they will be depends solely on the creativity of the developer. This report will explore the capabilities of the ROSbot robotic development platform to tackle a variety of tasks. The capabilities of this platform can be used in educational institutions to train future programmers in the field of robotics.

Keywords: Robotics, ROS, Autonomous robots, Mobile robots, Path planning

## REFERENCES

Cañas, J. M., Perdices, E., García-Pérez, L., & Fernández-Conde, J. (2020). a ROS-based open tool for intelligent robotics education. *Applied Sciences*, 10(21), 7419.

Fu, G., & Zhang, X. (2015, July). *ROSBOT: a low-cost autonomous social robot*. In 2015 IEEE International Conference on Advanced Intelligent Mechatronics (AIM) (pp. 1789-1794). IEEE.

Köseoğlu, M., Çelik, O. M., & Pektaş, Ö. (2017, September). *Design of an autonomous mobile robot based on ROS*. In 2017 International Artificial Intelligence and Data Processing Symposium (IDAP) (pp. 1-5). IEEE.

Looi, C. Z., & Ng, D. W. K. (2021). a study on the effect of parameters for ROS motion planer and navigation system for indoor robot. *International Journal of Electrical and Computer Engineering Research*, 1(1), 29-36.

Megalingam, R. K., Reddy, R. S., Jahnavi, Y., & Motheram, M. (2019, January). *ROS based control of robot using voice recognition*. In 2019 Third International Conference on Inventive Systems and Control (ICISC) (pp. 501-507). IEEE.

Thale, S. P., Prabhu, M. M., Thakur, P. V., & Kadam, P. (2020). *ROS based SLAM implementation for Autonomous navigation using Turtlebot*. In ITM Web of conferences (Vol. 32, p. 01011). EDP Sciences.

# 3D CONTENT CREATION THROUGH THE USE OF COMPUTER MODELING METHODS

#### Assoc. Prof. Georgi Hristov, PhD

Department of Telecommunications "Angel Kanchev" University of Ruse Phone: 0035982 888 663 E-mail: ghristov@uni-ruse.bg

### Assoc. Prof. Plamen Zahariev, PhD

Department of Telecommunications "Angel Kanchev" University of Ruse Phone: 0035982 888 663 E-mail: pzahariev@uni-ruse.bg

### Eng. Georgi Georgiev, PhD Student

Department of Telecommunications, "Angel Kanchev" University of Ruse Tel.: 082 888 353 E-mail: gdgeorgiev@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

**Abstract:** Reconstruction and development of 3D models are complex tasks which require basic knowledge and understanding of 3D modeling approaches. Despite the diversity of approaches there are some common steps that should be followed for creation of decent three-dimensional models. These steps might be summarized as follows: selecting an objects for 3D modeling, choosing an appropriate method for reconstruction, passing through the workflow of the selected method, further processing (post-processing). In the paper the trends in the area of the 3D modeling of different objects are investigated and a solution for integration of 3D content in virtual environments is provided.

Keywords: 3D content, 3D modeling, 3D modeling technologies;

## REFERENCES

Antonaci, Alessandra, Michela Ott, and Francesca Pozzi. (2013) Virtual museums, cultural heritage education and 21st Century skills. Learning & Teaching with Media & Technology 185.

Bendis, Jared E. (2007) Developing educational virtual worlds with game engines." ACM SIGGRAPH 2007 educators' program. ACM.

Kerstena, T. P., F. Tschirschwitza, and S. Deggima. (2017) Development of a Virtual Museum Including a 4d Presentation of Building History in Virtual Reality. ISPRS-International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences (2017): 361-367.

Sylaiou, Stella, et al. (2010) Exploring the relationship between presence and enjoyment in a virtual museum." International journal of humancomputer studies 68.5 (2010): 243-253.

# DESIGNING AND DEVELOPING AN INTERNET OF THINGS SMART AGRICULTURE SOLUTION

#### Assoc. Prof. Georgi Hristov, PhD

Department of Telecommunications "Angel Kanchev" University of Ruse Phone: 0035982 888 663 E-mail: ghristov@uni-ruse.bg

### Eng. Georgi Georgiev, PhD Student

Department of Telecommunications, "Angel Kanchev" University of Ruse Tel.: 082 888 353 E-mail: gdgeorgiev@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

**Abstract:** The Internet of Things (IoT) is a new concept that is gaining extremely fast popularity in recent years. This concept is gaining ground rapidly and is widely used in various areas of our lives. The Internet of Things (IoT) is at the core of today's smart cities, which rely on information gathered from various sensor modules to improve the efficiency of the urban ecosystem as well as to enhance the quality of life. The Internet of Things (IoT) technology can be integrated and to be useful, for example, in the field of healthcare to monitor the health status of patients, or it can be used for fitness tracking to create statistics on the activities of the training people without the use of mobile phones. In smart agriculture, the Internet of Things (IoT) can be used for real-time monitoring of various soil and environmental parameters. In this paper, a concept for creating a comprehensive platform for monitoring, recording and analyzing the results of measurements of soil and environmental parameters is considered.

Keywords: Smart solutions, Internet of Things, Smart agriculture

## REFERENCES

Evans, D. (2011). The internet of things: How the next evolution of the internet is changing everything. CISCO white paper, 1(2011), 1-11.

Monk, S. (2016). Programming Arduino: getting started with sketches. Tab Books.

Alliance, L. (2015). a technical overview of LoRa and LoRaWAN. White Paper, November.

Bor, M., Vidler, J. E., & Roedig, U. (2016). LoRa for the Internet of Things.

Semtech, A. N. 120022, LoRa Modulation Basics, May, 2015.

Kim, D. Y., & Kim, S. (2015). LoRaWAN Technology for Internet of Things. Journal of platform technology, 3(1), 3-8.

Rose, K., S. Eldridge, L. Chapin. The Internet of Things: An Overview, Understanding the Issues and Challenges of a More Connected World. The Internet Society (ISOC), 2015.

# COMPARISON OF SOFTWARE FOR UAV PHOTOGRAMMETRY

### Assoc. Prof. Nina Bencheva PhD

Department of Telecommunications, "Angel Kanchev" University of Ruse, Bulgaria Tel.: +359 887746257 E-mail: nina@uni-ruse.bg

### Chief assistant Eng. Monika Bedzheva, PhD

Department of Artillery and Geodesy, Shumen "Vasil Levski" National Military University, Veliko Tarnovo Phone: 054-263 E-mail: monibedzh17@abv.bg

**Abstract:** In recent years photogrammetry has gained great popularity thanks to unmanned aerial vehicles (UAVs), commonly known as drones. Along with their development, the software for UAV photogrammetry has also developed, thus leading to a variety of photogrammetric software products. In order to help customers to orientate some manufacturers provide free trial versions of their software. That is the case with two of the most popular photogrammetric software – Agisoft PhotoScan (now Metashape) and 3D Survey. In this paper their pros and cons are discussed and some advice on their use is given.

Keywords: UAV, Photogrammetry, Software

## REFERENCES

Agisoft Metashape User Manual, Professional Edition, Version 1.7

Bedzheva, M., (2022). Contemporary technologies for digital photogrammetry. "Vasil Levski" University Press (in print) (**Оригинално заглавие:** Беджева, М., 2022. Съвременни технологии за цифрова фотограметрия. Университеско издателство "Васил Левски" (под печат))

3DSurvey, User manual, Version 2.7.0

https://www.youtube.com/user/3Dsurvey/playlists

# EVALUATION OF THE SUITABILITY OF UAV ORTHOPHOTO FOR CADASTRE

### Chief assistant Eng. Monika Bedzheva, PhD

Department of Artillery and Geodesy, Shumen "Vasil Levski" National Military University, Veliko Tarnovo Phone: 054-263 E-mail: monibedzh17@abv.bg

**Abstract:** Unmanned aerial vehicles (UAVs) have gained vast popularity in recent years. UAVs, called also drones, have found application in many spheres of life – form military to civil applications, from amateur to professional uses. UAVs have made it quick and easy to gather geospatial information, thus optimizing the production process in surveying, cartography and cadastre. Having this in mind, an experiment was carried out to evaluate the suitability of UAV orthophoto for cadastre. In this paper the obtained accuracy is compared with the regulatory requirements and the results are discussed and analyzed.

Keywords: UAV, Photogrammetry, Accuracy, Cadastre

### REFERENCES

Bedzheva, M., (2022). Contemporary technologies for digital photogrammetry. "Vasil Levski" University Press (in print) (**Оригинално заглавие:** Беджева, М., 2022. Съвременни технологии за цифрова фотограметрия. Университеско издателство "Васил Левски" (под печат))

Ordinance No. 19 of December 28, 2001 on control and acceptance of the cadastral map and cadastral registers (*Оригинално заглавие: Наредба 19 от 28 декември 2001 г. за контрол и приемане на кадастралната карта и кадастралните регистри*)

Ordinance No. 3 of April 28, 2005 on the content, creation and maintenance of the cadastral map and cadastral registers (*Оригинално заглавие:* Наредба № 3 от 28 април 2005 г. за съдържанието, създаването и поддържането на кадастралната карта и кадастралните регистри)

## FRI-2G.302-2-CCT2-01

# AN APPROACH FOR BUILDING SECURE COMMUNICATION BY THE MEANS OF COMPLEMENTARY SIGNALS

#### **Eng. Dimitar Marinov PhD Student**

Department of Telecommunications, "Angel Kanchev" University of Ruse, Bulgaria Tel.: +359 82 888 673 E-mail: dmarinov@uni-ruse.bg

#### Eng. Miroslav Nedelchev, PhD Student

Computer systems and technologies Department, "Vasil Levski" National Military University, Faculty "Artillery, AD and CIS", Shumen, Bulgaria Tel.: +359 885288754 E-mail: nedel4ew@abv.bg

### Eng. Dobri Stoyanov, PhD Student

Communication networks and systems Department, "Vasil Levski" National Military University, Faculty "Artillery, AD and CIS", Shumen, Bulgaria Phone: +359 897567136 E-mail: dobri\_stoyanov@mail.bg

#### **Eng. Stanimir Parvanov**

Air Defense Department, "Vasil Levski" National Military University, Faculty "Artillery, AD and CIS", Shumen, Bulgaria Phone: +359 885123955 E-mail: ssparvanov@gmail.com

**Abstract:** Today, building secure communications is a very topical issue. Most often, it is solved by the application of signals with a complex inner structure, cryptographic tools, as well as specialized protocols for the exchange of messages. However, the continuous upward development of cyber attack technologies necessitates the development of combined approaches for cyber defense of communication and computer networks. Given this situation, the report substantiates the possibility of building a multi-layered cyber defense of communication and computer networks by simultaneously using channel coding through complementary signals and encryption, using a unified design.

Keywords: secure communication, reliable communication, complementary signals.

## REFERENCES

Golay, M. (1961). Complementary series, *IRE Transactions on Information Theory*, 1961, vol. IT -7, No2, pp. 82 -87

Iliev, M., Bedzhev, B., Bedzheva, M., & Kanchev, K. (2021). Approaches for Implementation of Golay's Complementary signals and Welti's Quaternary Signals in Radio-Communication Systems, *Proceedings of the 2021 IEEE International Conference on Information Technologies* (*InfoTech-2021*), 16-17 September 2021, St. St. Constantine and Elena, Bulgaria

Tseng, C., & Liu, S. (1972). Complementary sets of sequences, *IEEE Transactions on Information Theory*, 1972, vol. IT- 18, №5, p. 644 – 652

# CONTEMPORARY APPROACHES FOR EFFECTIVE RADIO SPECTRUM UTILIZATION

### Eng. Teodora Ignatova PhD Student

Department of Telecommunications,\ "Angel Kanchev" University of Ruse, Bulgaria Tel.: +359 82 888 673 E-mail: tignatova@uni-ruse.bg

#### Miroslav Nedelchev – PhD Student

Computer Systems and Technology Department, "Vasil Levski" National Military University, Faculty "Artillery, AD and CIS", Shumen, Bulgaria Tel.: +359 885 288 754 E-mail: nedel4ew@abv.bg

### Chief assistant Eng. Monika Bedzheva, PhD

Department of Artillery and Geodesy, Shumen "Vasil Levski" National Military University, Veliko Tarnovo Phone: 054-263 E-mail: monibedzh17@abv.bg

**Abstract:** New principles and approaches for efficient use of the spectrum are considered. Methods for spectrum compaction, approach to assigning frequencies (WAPECS), and shared access models are presented. The application of cognitive radio in licensed shared access models is shown to complement traditional approaches. The problems in their realization and possible solutions are described.

Keywords – Spectrum sharing; Licensed Shared Access; Cognitive radio.

## REFERENCES

Abdullahi, M., Sani, S., & Muazu B. (2015). Cooperative Spectrum Sensing and Determination of Optimum Threshold in Cognitive Radio System, *International Journal of Computer Applications*, vol. 122, pp. 32-38, July, 2015.

Awin, F., Alginahi, Y., Abdel-Raheem, E. (2019). Technical Issues on Cognitive Radio-Based Internet of Things Systems: a Survey, *Article in IEEE Access*, August 2019, Vol. 7., DOI: 10.110

Chanev, S. (2021). Active directions for increasing the opportunities for combat UAVs on the battlefield, *Proceedings of International Scientific Conference "Defense Technologies" DefTech 2021*, Faculty "Artillery, AD and CIS", Shumen, Bulgaria pp 92-99 (*Оригинално заглавие:* Чанев, С. (2021). Активни направления за повишаване на възможностите за противодействие на БЛА на бойното поле, Сборник научни трудове на Международната научна конференция "Отбранителни технологии" DefTech 2021, Факултет "Артилерия, ПВО и КИС", стр. 92-99)

Electronic Communications Committee, (2008), "Report from CEPT to the European Commission in response to the Mandate to develop least restrictive technical conditions for frequency bands addressed in the context of WAPECS Final Report"

Federal Communications Commission, (2002) "Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems", ET Docket 98-153

Ghosh, G., Das, P., & Chatterjee, S. (2014). Cognitive Radio And Dynamic Spectrum Access – A Study, *International Journal of Next-Generation Networks (IJNGN)*, vol. 6, pp. 43-58, March, 2014.

https://sds.wirelessinnovation.org/

Kacev, I. (2021). Analysis of the opportunities for employment unmanned aerial vehicles class mini in artillery formation, *Proceedings of International Scientific Conference "Defense Technologies" DefTech 2021*, Faculty "Artillery, AD and CIS", Shumen, Bulgaria pp 116-123

Olanrewaju, B., & Osunade, O. (2012). *Survey of Related Technologies for Improved Spectrum Efficiency*, IOSR Journal of Engineering (IOSRJEN), e-ISSN: 2250-3021, p-ISSN: 2278-8719, www.iosrjen.org, Volume 2, Issue 11, November 2012, pp 25-33.

Shivapanchakshari, T., & Aravinda H. (2017). Review of Research Techniques to Improve System Performance of Smart Antenna, *Open Journal of Antennas and Propagation*, 2017, 3-98 http://www.scirp.org/journal/ojapr, ISSN Online: 2329-8413,ISSN Print: 2329-8421

Vinogrdov, E. (2016). State of the art- Ways for increasing spectrum efficiency and implementation of new radio technologies, *Information technology and telecommunication*, vol.4  $N_{2}1$ , pp 68-78

# A HEURISTIC APPROACH FOR SYNTHESIS OF QUASI COMPLEMENTARY SIGNALS

### **Prof. Mihail Iliev, DSc**

Department of Telecommunications, "Angel Kanchev" University of Ruse, Bulgaria Tel.: +359 887544257 E-mail: miliev@uni-ruse.bg

#### Nikolay Nikolov, PhD

State Agency for National Security, E-mail: niki2\_1974@abv.bg

### Chief assistant Eng. Monika Bedzheva, PhD

Department of Artillery and Geodesy, Shumen "Vasil Levski" National Military University, Veliko Tarnovo Phone: 054-263 E-mail: monibedzh17@abv.bg

**Abstract:** The paper reviews a heuristic approach to generate quasi complementary signals. The heuristic algorithm starts from the worst starting point. The proposed scientific implementation depends on a sequential shift of the two initial sequences with the goal of minimizing the impact of local extremums until reaching the final criterion. The approach, substantiated in the paper, could be applied for development of new radar and radio-communication systems, possessing ability for reliable performance in hostile radio-electronic environment.

Keywords: heuristic algorithm, optimization, quasi complementary signals.

## REFERENCES

Golay, M. (1961). Complementary series, *IRE Transactions on Information Theory*, 1961, vol. IT -7, No2, pp. 82 -87

Fiedler, F., Jedwab, J. & Parker, M. (2008). a Framework for the Construction of Golay Sequences, *IEEE Transactions on Information Theory*, 2008, Volume: 54, Issue: 7, July 2008, pp. 3114 – 3129

# BUILDING A CENTRALISED SMART CITY SYSTEM FOR URBAN MOBILITY MANAGEMENT AND SOLVING PROBLEMS RELATED TO PARKING AREAS, PUBLIC TRANSPORT AND ECO-TRANSPORT -TYPES OF COMMUNICATION AND DATA EXCHANGE PROTOCOLS BETWEEN DEVICES IN THE EXTERIOR PART OF THE SMART CITY SYSTEM

#### Eng. Ivan Kolev, PhD

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

### Assoc. Prof. Georgi Hristov, PhD

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

### Assoc. Prof. Plamen Zahariev, PhD

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

Abstract: The focus of this article is to consider the basic protocols of communication and all the building blocks of the entire hardware and software structure in the construction of Smart City System in public transport. The basic concepts of the names and the function of the individual building elements and their division (hardware + software) of the whole structure of two main subdivisions will be introduced, conditionally called Exterior and Interior. The need to create such a centralized system, which consists of many different software applications communicating via API (Application Programming Interface), data collection in the central database, performing the necessary computational actions on central servers will be considered. The structure of the communication protocols for data exchange via REST API, which are specifically developed for Smart City System - Public Urban Transport, will also be considered and the overall concept of data exchange between the individual hardware and software modules will be explained through these protocols.

**Keywords:** Smart City, smart solutions, public transport, eco transport, LoraWan network, API and central database, smartphone app, Android, iOS, Validators, Centralized system, Web applications, Servers, efficiency, GPS

#### REFERENCES

Lim, C., K.-J. Kim and P. P. Maglio (2018). Smart cities with big data: Reference models, challenges, and considerations, Cities, Vol. 82, 2018, Pages 86-99, ISSN 0264-2751, https://doi.org/10.1016/j.cities.2018.04.011.

Hashem, I. A. T., V. Chang, N. B. Anuar, K. Adewole, I. Yaqoob, A. Gani, E. Ahmed and H. Chiroma (2016). The role of big data in smart city, Int. J. Inf. Manage., vol. 36, no. 5, pp. 748–758, 2016.

Souza, A., M. Figueredo, N. Cacho, D. Araújo, and C. A. Prolo (2016). Using big data and real-time analytics to support smart city initiatives, IFAC-PapersOnLine, Vol 49, Issue 30, 2016, Pages 257-262, ISSN 2405-8963, https://doi.org/10.1016/j.ifacol.2016.11.121.

Thakuriah, P., L. Dirks and Y. Keita (2016). Digital Infomediaries and Civic Hacking in Emerging Urban Data Initiatives, Seeing Cities Through Big Data: Research Methods and Applications in Urban Informatics, New York, NY, USA, Springer, Oct. 2016, pp. 189–207.

Jara, A. J., D. Genoud, and Y. Bocchi (2014). Big data in smart cities: from poisson to human dynamics, 28<sup>th</sup> Int. Conf. Adv. Inf. Netw. Appl. Workshops, May 2014, pp. 785–790.

# BUILDING A CENTRALISED SMART CITY SYSTEM FOR URBAN MOBILITY MANAGEMENT AND SOLVING PROBLEMS RELATED TO PARKING AREAS, PUBLIC TRANSPORT AND ECO-TRANSPORT -OFFLINE VALIDATION OF TRANSPORT DOCUMENTS FROM THE SMART CITY SYSTEM

## Eng. Ivan Kolev, PhD

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

## Assoc. Prof. Georgi Hristov, PhD

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

## Assoc. Prof. Plamen Zahariev, PhD

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

**Abstract:** The focus of this article is to examine in detail all possible cases and their respective Validation Algorithms for the different types of Transport Documents from the Smart City Public Transport System. Two main scenarios will be considered, respectively, in the presence of an Internet connection (ONLINE VALIDATION), ie. when we have a connection through the REST API to the central servers and respectively a scenario, in the absence of an Internet connection (OFFLINE VALIDATION), when local validation must be performed from the available hardware in the vehicle itself. Also, all the principles set for structuring the data parameters in the Electronic PD (Transport Documents) and in the physical carriers for Subscription - Mifare plastic cards will be considered in detail, in which the basic information about the Subscription itself is recorded and read, namely number of trips, period of validity, accessible lines, subscription card holder / user.

**Keywords:** Smart City, smart solutions, public transport, eco transport, LoRaWan network, API and central database, smartphone app, Android, iOS, Validators, Centralised system, Web applications, Servers, efficiency, GPS

#### REFERENCES

Liu, T. and A. Ceder (2015). Analysis of a new public-transport-service concept: Customized bus in China, Transp. Policy, vol. 39, 2015, pp. 63–76.

Liu, T., A. A. Ceder, R. Bologna and B. Cabantous (2016). Commuting by customized bus: a comparative analysis with private car and conventional public transport in two cities, Journal on Public Transp., vol. 19, no. 2, 2016, pp. 1-4.

Zhang, J., D. Z. Wang and M. Meng (2017). Analyzing customized bus service on a multimodal travel corridor: An analytical modeling approach, Journal on Transp. Eng., A, Syst., vol. 143, no. 11, 2017, Art. no. 4017057.

Tong, L. C., L. Zhou, J. Liu and X. Zhou (2017). Customized bus service design for jointly optimizing passenger-to-vehicle assignment and vehicle routing, Transp. Res. C, Emerg. Technol., vol. 85, pp. 451–475, Dec. 2017.

Huang, W., W. Jin, J. Huang and B. Han (2018). Pricing problem of customized bus under different market strategies, J. Guangxi Normal Univ. (Natural Sci. Ed.), vol. 2, p. 2, Feb. 2018.

# BUILDING A CENTRALISED SMART CITY SYSTEM FOR URBAN MOBILITY MANAGEMENT AND SOLVING PROBLEMS RELATED TO PARKING AREAS, PUBLIC TRANSPORT AND ECO-TRANSPORT -SMART PARKING SYSTEM NETWORK ARCHITECTURE AND OPTIMIZATION

### Eng. Ivan Kolev, PhD

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

#### Assoc. Prof. Georgi Hristov, PhD

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

#### Assoc. Prof. Plamen Zahariev, PhD

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

**Abstract:** The goal in the development of traffic management systems, and in particular the implementation of complete intelligent parking systems in an urban environment, is to reduce personnel costs and optimize the use of all available resources. Currently, finding a parking space is usually random, with the driver finding one on the street based on sheer luck or multiple attempts. The process sometimes takes a lot of time and effort and, in the worst case, to the impossibility of finding a parking space. An alternative is to identify a specific paid parking lot that has a sufficiently large capacity and/or use prepaid parking subscription services accordingly. However, this is not an optimal solution, as it is usually possible that the parking lot in question is far from the user's destination.

On the other hand, intelligent parking systems, and specifically those based on the streets themselves along the sidewalks, are based on LoRa nodes. The number of these networks is increasing due to their operation in the unlicensed radio frequency bands and their easy and relatively cheap construction. The scalability of such networks suffers as the number of deployed devices increases. Performance drops due to increased contention and interference on unlicensed LoRa frequencies. This leads to an increased number of dropped messages and therefore to unreliable network communication.

**Keywords:** Smart City, smart solutions, public transport, eco transport, LoraWan network, API and central database, smartphone app, Android, iOS, Validators, Centralised system, Web applications, Servers, efficiency, GPS

#### REFERENCES

Geng, Y. and C. G. Cassandras (2011). a new 'smart parking' system based on optimal resource allocation and reservations, 14<sup>th</sup> International IEEE Conference on Intelligent Transportation Systems (ITSC), 2011, pp. 979-984, doi: 10.1109/ITSC.2011.6082832.

Zhao, X., K. Zhao and F. Hai (2014). An algorithm of parking planning for smart parking system, 11<sup>th</sup> World Congr. Intell. Control Autom. (WCICA), 2014, pp. 4965–4969.

Bankov, D., E. Khorov and A. Lyakhov (2017). Mathematical model of LoRaWAN channel access with capture effect, IEEE 28<sup>th</sup> Annu. Int. Symp. Personal, Indoor, Mobile Radio Commun., 2017

Rizzi, M., P. Ferrari, A. Flammini and E. Sisinni (2017). Evaluation of the IoT LoRaWAN solution for distributed measurement applications, IEEE Trans. Instrum. Meas., vol. 66, no. 12, pp. 3340–3349, Dec. 2017.

# CLOUD COMPUTING- IMPLEMENTATION METHODS, ADVANTAGES AND DISADVANTAGES

### Eng. Miroslav Martinov, PhD Student,

Department of Telecommunications, University of Ruse, Bulgaria, Tel.: +359 89 5411779 E-mail: miro.martinov@gmail.com

**Abstract:** The advent of cloud computing technologies has allowed users to access many different services over the Internet. They provide data storage and access to it at any time regardless of where the user is. Cloud computing allows businesses to ensure maximum data security and privacy, as well as to ensure reliable recovery and backup of the information. This paper examines the basic types and operations of cloud computing technology. It will cover the main characteristics of cloud computing, deployment models, service models, uses, advantages-disadvantages, architecture, service provider and much more.

Keywords: Cloud, Cloud Computting

### REFERENCES

Mladenova, M. (2011) Cloud Computing - Basics, Advantages, Disadvantages and Risks, Status and Prospects, Intel Entrans Publishing House, pp. 92, ISBN 978-954-2910-07-7 (Оригинално заглавие: Младенова, М. (2011). Облачни изчисления – същност, предиства, недостатъци и рискове, състояние и переспективи, Интел Ентранс, стр. 92, ISBN 978-954-2910-07-7).

Rahman, M.D.S. (2021). Cloud computing technology, Ankang University, Shaanxi, China.

Arulmozhi, P. A. Jayapalan, S. S. P. Charan, B. S. Sumanth Kumar, N. Sudharshana and P. Raj (2018). Device to Cloud (D2C) Integration for Automated Device Management, Second International Conference on Green Computing and Internet of Things (ICGCIoT), pp. 166-172, doi: 10.1109/ICGCIoT.2018.8753009.

Sain, M. (2013). The future of cloud integration: Cloud Middleware?," 2013 15th International Conference on Advanced Communications Technology (ICACT), IEEE, PyeongChang, Korea (South), ISBN 978-89-968650-1-8.

Jinguang, H. W. Susilo, Y. Mu (2013). Identity-based data storage in cloud computing, Future Generation Computer Systems, Vol. 29, Issue 3, 2013, Pages 673-681, ISSN 0167-739X, DOI:10.1016/j.future.2012.07.010.

Puri, G. S., R. Tiwary and S. Shukla (2019). a Review on Cloud Computing, 2019 9th International Conference on Cloud Computing, Data Science & Engineering (Confluence), 2019, pp. 63-68, DOI:10.1109/CONFLUENCE.2019.8776907.

Sabahi, F. (2011). Cloud computing security threats and responses, 2011 IEEE 3rd International Conference on Communication Software and Networks, 2011, pp. 245-249, doi: 10.1109/ICCSN.2011.6014715.

Puthal, D., B. P. S. Sahoo, S. Mishra and S. Swain (2015). Cloud Computing Features, Issues, and Challenges: a Big Picture, 2015 International Conference on Computational Intelligence and Networks, 2015, pp. 116-123, doi: 10.1109/CINE.2015.31.

# ANALYSIS OF IPV6 SCANNING AND EXPLOITATION ATTACKS

## Eng. Petar Stoilov, PhD Student

Department of Telecommunications, University of Ruse "Angel Kanchev" Phone.: +359 88 79 79 174 E-mail: pstoilov@uni-ruse.bg

### Assoc. Prof. Georgi Hristov, PhD

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

### Assoc. Prof. Plamen Zahariev, PhD

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

Abstract: The paper reviews the existing IPv6 methods and strategies of scanning and which are the IP address security vulnerabilities exposed on the Internet that enable researchers to create effective defenses against potential attacks. In this paper, the different DNS scanners and techniques, Random scanning strategies and methods, as well low-byte scanning strategy will be reviewed. Once a vulnerability is detected in the IPv6 network, the Linux kernel can be used for the implementation of various attacks for code injection and exploitation. Remote access to the Windows Operating system can also be obtained using specific attacks and networks vulnerabilities in machines with assigned IPv6 addresses. The focus of the paper will also be directed on the Media Access Control (MAC) addresses, which are designed to be unique Layer-2 network interface hardware identifiers, and the related to them vulnerabilities and exploits.

Keywords: IPv6, MAC, exploits,

## REFERENCES

J. Martin, E. C. Rye and R. Beverly (2016). Decomposition of MAC Address Structure for Granular Device Inference, Proceedings of the Annual Computer Security Applications Conference (ACSAC), Dec. 2016.

Vanhoef, M., C. Matte, M. Cunche, L. S. Cardoso and F. Piessens (2016). Why MAC Address Randomization is Not Enough: An Analysis of Wi-Fi Network Discovery Mechanisms, Proceedings of the 11<sup>th</sup> ACM on Asia Conference on Computer and Communications Security, 2016, pp. 413–424.

Gont, F. and T. Chown (2016). Network reconnaissance in IPv6 networks, RFC 7707, RFC Editor, March 2016.

Gasser, O., Q. Scheitle, S. Gebhard and G. Carle (2016). Scanning the IPv6 internet: towards a comprehensive hitlist, arXiv preprint, arXiv:1607.05179, 2016.

Google IPv6 statistics (2022). https://www.google.com/intl/en/ipv6/statistics.html (Accessed on 2/10/2022).

L. Howard (2018). Reverse DNS in IPv6 for Internet service providers, RFC 8501, RFC Editor, November 2018.

# DISCOVERY AND ANALYSIS OF EXIF DATA IN IMAGES

## Eng. Petar Stoilov, PhD Student

Department of Telecommunications, University of Ruse "Angel Kanchev" Phone.: +359 88 79 79 174 E-mail: pstoilov@uni-ruse.bg

**Abstract:** with the rapid expansion of cybercrime, it has become important and urgent to begin conducting studies and research specialized in the evaluation on how the information is saved and how it is used as digital media metadata. This paper reviews how, in many cases, when a computer, phone, or mobile device is seized for evidence, the system will have graphic images that might be used as evidence. Digital images have stamps recorded as metadata written by its source. This could be a phone, camera or written on computer. Most digital devices "stamp" information on these graphic images that can tell us a lot about the who, what, when, and where the pictures were taken. This information is known as EXIF data and can very often be useful to the forensic investigators. The coordinates from the geolocation of the digital image can be reversed to display the location of the photoshoot on the maps.

Keywords: EXIF data, digital images, GPS, image forensics, image processing, image forgery detection, image metadata

#### REFERENCES

Wang. J., G. Liu, Z. Zhang. Y. Dainad and Z. Wang (2009). Fast and robust forensics for image region- duplication forgery, Acta Automatica Sinica, Vol.35, no.12, pp 1488-95, Dec 2009.

EXIF Data Viewer (2021). https://www.exifdata.com/exif.php

Safonov, I. V., I. V. Kurilin, M. N. Rychagov and E. V. Tolstaya (2018). Adaptive Image Processing Algorithms for Printing, Springer Singapore, pp. 304, ISBN 978-981-10-6930-7.

Zhao, Q., C. Zuo, G. Pellegrino and I. Zhiqiang (2019). Geo-locating Drivers: a Study of Sensitive Data Leakage in Ride-Hailing Services, NDSS Network and Distributed System Security Symposium (NDSS 2019), February 2019.

Vailaya, A., M. A. T. Figueiredo, A. K. Jain and Hong-Jiang Zhang (2001). Image classification for content-based indexing, IEEE Transactions on Image Processing, vol. 10, no. 1, pp. 117-130, Jan. 2001, doi: 10.1109/83.892448.

Boutell, M. and J. Luo (2004). Photo classification by integrating Image content and camera metadata, 17<sup>th</sup> International Conference on Pattern Recognition, Volume 4, 23-26 Aug. 2004, pp. 901–904.

Ali, S.S., I. I. Ganapathi, N. S. Vu, S.D. Ali, N. Saxena and N. Werghi (2022). Image Forgery Detection Using Deep Learning by Recompressing Images, Electronics 11(3), 403, 2022, DOI:10.3390/electronics11030403.

# TECHNIQUES TO PROTECT KEY OBJECTS FROM UNMANNED AERIAL VEHICLES

### Eng. Georgi Georgiev PhD Student

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

#### Assist. Prof. Stanimir Parvanov

Air Defence Department, Shumen "Vasil Levski" National Military University, Veliko Tarnovo Tel.: +359 885 123 955 E-mail: ssparvanov@gmail.com

### Assist. Prof. Georgi Kozarev

Air Defence Department, Shumen "Vasil Levski" National Military University, Veliko Tarnovo Tel.: +359 894 312 246 E-mail: goshakis@abv.bg

Abstract: This paper reviews and compares different unmanned aerial vehicle (UAV) countermeasures, and suggests techniques for combining Anti-drone radar systems. Nowadays, every smart device is networked and can be controlled remotely or collect information about the activity or cycle of actions it performs. The more connected the devices are, the more difficult it becomes to protect them during data transfer. If until now the main protection of networks was cyber security and the protocols and certificates introduced for data transfer protection, it should be noted that in recent years, unmanned aerial vehicles (UAVs) have also developed, which pose a threat to networks on another level. UAVs can undetected spy on key servers, data warehouses, military sites, airports, critical infrastructure sites and destabilize or stop their operation.

Keywords: Grid protection, Unmanned Aerial Vehicles, Air Defense, Anti-drone radar systems, Protection.

## REFERENCES

Carvalho, M., (2016). Experimentation Support for Cyber Security Evaluations, *Proceedings* of the 11th Annual Cyber and Information Security Research Conference on - CISRC '2016;

Demir, K., (2015). Unmanned Aerial Vehicle Domain: Areas of Research, *Defence Science Journal*, 2015;

A Review on Identification of RADAR Range for the Target by using C Band, *IRJET*, Volume: 09, 05 May 2022 e-ISSN: 2395-0056;

Rudys, S., Ragulis, P., Lau<sup>c</sup>ys, A., Bru<sup>c</sup>asand, D., Pomarnacki, R., & Plonis, D., (2022). Investigation of UAV Detection by Different Solid-StateMarine Radars, *Electronics*, 2022, 11, 2502.

https://aerocorner.com/blog/types-of-drones/

### FRI-2.206-1-TMS-01

# PERSONAL EFFECTIVENESS AND SCIENTIFIC PRODUCTIVITY OF DOCTORAL STUDENTS

#### Assoc. Prof. Vyarka Ronkova, PhD

Department of "Machine Science, Machine Elements, Engineering Graphics and Physics", "Angel Kanchev" University of Ruse Tel.: +359 82 888 461 E-mail: vronkova@uni-ruse.bg

#### Prof. Antoaneta Dobreva, PhD

Department of "Machine Science, Machine Elements, Engineering Graphics and Physics", "Angel Kanchev" University of Ruse Mob. Phone: +359 887 746 311 E-mail: adobreva@uni-ruse.bg

**Abstract:** The paper reviews the sifnificance of some essential soft skills. The personal effectiveness and scientific productivity of the doctoral students at the department of "Machine Science, Machine Elements, Engineering Graphics and Physics" was analyzed based upon the quarterly and annual reports of the PhD students. a research methodology concerning the opinion of doctoral students on their personal effectiveness and scientific productivity has been perfected. Additional topics and questions related to critical creative thinking, solving scientific problems, and time management for their scientific and educational activities have been included in the investihation. The results obtained have been analyzed and presented graphically. Conclusions and recommendations have been made. Authors' team envisages different measures and activities in order to improve the significant soft skills of doctoral students.

Keywords: Personal Effectiveness, Scientific Productivity, Research Methodology, Doctoral Education JEL Codes: C90

## REFERENCES

Beloev, H., Atanasova, D. & Serbezova, S. (2021). *Participation of the Universities in International Rating System: An Evitable Need or Challenge*, Vol 60 (9.1). Proceedings of UoR, ISBN: 1311-3321, pp 26-33.

Beloev, H., Antonova, D., Smrikarov, A., Ivanova, G., Zlatarov, P. & Baeva, D. (2021). *Innovations in Doctoral Students Education and Training.* ACM International Conference Proceeding Series, SJR 2020 0.182, 22nd International Conference on Computer Systems and Technologies, CompSysTech 2021, pp.224-230.

Beloev H., V. Pencheva, J.Popova. (2019). *The University of Ruse "Angel Kanchev" as a Driving Force in the Regional Development*. Proc. of Balkan Universities Association, pp 1-6.

Dobreva, A. & Haralanova, V. (2013). *Measuring and Evaluation in Machine Science and Design Education, based upon Diagnostic Research*, Procedia - Social and Behavioral Sciences, WCLTA, Brussels, 3rd World Conference on Learning, Teaching and Educational Leadership, Vol 93, pp. 1190-1194.

Dobreva, A. & Dobrev, V. (2020). *Digital Transformation Dynamics in Higher Education*, Proceedings of UoR, Vol 59, pp 12-16.

Haralanova, V. V. Ronkova. (2012). *Appraising Methodology Concerning Students*` *Results in Course of Applied Geometry and Engineering Graphics*. MENDELTECH INTERNATIONAL 2012 – International Scientific Conference, Brno, Czech Rrpublic, ISBN 978-80-7375-625-3.

Kamenov, K., A. Dobreva, V. Ronkova. (2017). Advanced Engineering Methods in Design and Education.// Material Science and Engineering, No 252, pp. 012033 – 37.

Kamenov, K., Dobreva, A. & Ronkova, V. (2016) *Interactive Technologies and New Teaching Models in Engineering Design based upon Multimedia Tools and Mobile Applications*, Fullpapers E-Book/ 4th World Congress on Education Research (WCER2016), No 1, pp. 90-95.

Ronkova, V. (2020) Training and Evaluation in Engineering Graphics of Students in Electronic Environment, Proceedings of UoR, Vol 59, book 4.1, pp. 28-32.

# INTEGRATION OF CAD SYSTEMS IN THE DIGITALIZATION PROCESS IN THE CONDITIONS OF REMOTE WORK AND INDUSTRY 4.0

#### Yuliyan Dimitrov, PhD

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

**Abstract:** This report explores the possibilities for automation and digitization of engineering processes using CAD systems. The study shows the features and positive qualities when working with CAD systems in the conditions of remote work and the digital revolution Industry 4.0. Questions about working with remote access and cloud services as possibilities of modern CAD systems are analyzed

Keywords: Industry 4.0, CAD system, digitization, remote work, cloud services

### REFERENCES

Dimitrova, Y. (2020). *CAD systems - for the digitalization of the study material for engineering specialties in higher education*, 59-та НК на Русенски университет "Ангел Кънчев", 2020, ISSN: 1311-3321

Dimitrov, Y., (2019). Digitization of technical documentation for its application in manufacturing in the context of Industry 4.0, Научен форум "Предизвикателствата на Индустрия 4.0 (2019). Букурещ, Румъния.

Dimitrov, Y. (2018). *Opportunities for work and distribution of technical documentation in small machine-building companies*, 57th Annual conference of Ruse University 2018, ISBN 1313-3321.

Dimitrov, Y. (2018). System for automatic distribution and working with technical documentation in small and micro-sized industrial enterprises, 29th DAAAM International Symposium, Zadar, Croatia 2018, ISBN: ISSN 1726-9679.

Попова, М., Ж. Овчарова (2018). Индустрия 4.0 Предизвикателства и последици за икономическото и социалното развитие на България, Фондация Фридрих Еберт, 2018, ISBN 978-954-2979-32-6.

https://xn--80 aahd dubcb0 awc4 bnhip4t.bg/tema/industriya-4.0/industriya-4.0-revolyut siya-evolyut siya-evolyut siya-bnhip4t.bg/tema/industriya-4.0/industriya-4.0-revolyut siya-evolyut siya-bnhip4t.bg/tema/industriya-4.0-revolyut siya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/tema/industriya-bnhip4t.bg/

https://www.spacecad.bg/teamcenter/34-common/proizvodstvo

https://solidedge.siemens.com/en/

https://www.haycad-infotech.bg/

# COMPARATIVE ANALYSIS OF SPECIFIC CAPABILITIES OF CAD SYSTEMS FOR DESIGN

#### Yordanka Dimitrova

Department of Mashine science, mashine elements and engineering graphics and physics University of Ruse "Angel Kanchev" E-mail: ydimitrova@uni-ruse.bg

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

**Abstract:** The report presents the results of a comparative analysis of the capabilities of some modern CAD systems for design and strength testing of machine elements - gears, shafts, bearings, etc.. The advantages and disadvantages of these CAD systems are analyzed. Conclusions are drawn for their application.

Keywords: gear, machine element,, CAD system, design of elements

## REFERENCES

Dimitrov, Y. & Kamenov, K., (2019) Application of AutoCAD .net api for simulation of cylindrical gears profiling; International BAPT Conferece POWER TRANSMISSIONS 2019, Varna, 2019, ISBN 978-619-7383.

Dimitrov, Y. & Kamenov, K., (2019) Specific opportunities through CAD systems for profiling a real involute curves of a spur gear; DAAAM International Scientific Book 2019, 2019, ISSN ISSN 1726-9687.

Dimitrov Y. (2015) Comparative analysis of technical indicators of gearboxes, Technics.Technologies.Education.Safety '15 Proceedings Volume 3, Veliko Tarnovo, Bulgaria, III International Scientific and Technical Conference, 2015, pp. 57-60, ISBN 1310 – 3946.

Dimitrov, Y. & Dobrev, V. (2015) a method for design of coaxial gearboxes, Technical Sciences and Industrial Management, Burgas, Bulgaria, IX International conference for young researchers, 2015, pp. 67-69, ISBN 1310-3946.

Dimitrov, Y. INFLUENCE OF THE DESIGN FEATURES OF THE SHAFTS ON THEIR MECHANICAL STRENGTH. IN: 60th Annual conference of Ruse University, Ruse, University of Ruse, 2021, pp. 52-56

Dimitrov, Y. STRENGTH RESEARCH OF a GEAR FROM a CAR GEARBOX - PROCESSING OF THE RESULTS. IN: 60th Annual conference of Ruse University, Ruse, University of Ruse, 2021, pp. 48-51

ISO 6336-1:2006. Calculation of load capacity of spur and helical gears - part 1: basic principles, introduction and general influence factors.

ISO 6336-2:2006. Calculation of load capacity of spur and helical gears -- part 2: calculation of surface durability (pitting).

ISO 6336-3:2006. Calculation of load capacity of spur and helical gears -- part 3: calculation of tooth bending strength.

# APPLICATION OF 2D CAD SYSTEMS IN DISTANCE LEARNING IN ENGINEERING GRAPHICS

Assoc. Prof. Krasimir Kamenov, PhD Faculty of Transport, "Angel Kanchev" University of Ruse Phone: 082-888 461 E-mail: kkamenov@uni-ruse.bg

**Abstract:** Distance learning offers great opportunities for student learning, but it is a real challenge for structuring and practical implementation of the learning process in technical disciplines related to graphic work. 2D CAD systems, having a number of drawing tools, are a necessary assistant and a means of visualizing the sequence for the production of graphic technical documentation. They are also used in checking the correctness of the geometric shapes, scale and dimensions of coursework sent by students as JPG photos. The paper reviews the practical experience of using 2D CAD systems in the distance education of students.

Keywords: Distance Learning, Engineering Graphics, Graphical Information, Correction, 2D CAD systems

#### REFERENCES

Kamenov, K., Dobreva, A. & Ronkova, V. (2017). Advanced Engineering Methods in Design and Education. Material Science and Engineering, No 252, pp. 012033 – 37.

Haralanova, V. & Ronkova, R. (2012). *Appraising Methodology Concerning Students*` *Results in Course of Applied Geometry and Engineering Graphics*. MENDELTECH INTERNATIONAL 2012 – International Scientific Conference, Brno, Czech Republic, ISBN 978-80-7375-625-3.

Haralanova, V., Kamenov, K. & Ronkova, V. (2018). *Challenges in Training on Engineering graphics - Experiences from two European Universities*. IN: Proceedings of EDULEARN18 Conference, Palma, Mallorca, Spain, pp. 7502-7513.

Ronkova, V. (2020). Development of Engineering Graphics in Higher Institutions. University of Ruse Publishing Center, 127 pp. ISBN 978-954-712-798-2. Original title: *Развитие на обучението по Инженерна графика във висшите училища*.

# STUDENTS IN ENGINEERING BACHELOR COURSES AND THEIR PRELIMINARY GENERAL TECHNICAL BACKGROUND

### Eng. Diana Nikolaeva,

Department of "Machine Science, Machine Elements, Engineering Graphics and Physics", "Angel Kanchev" University of Ruse Tel.: +359 82 888 328 E-mail: diana@uni-ruse.bg

### Assoc. Prof. Vyarka Ronkova, PhD

Department of "Machine Science, Machine Elements, Engineering Graphics and Physics", "Angel Kanchev" University of Ruse Tel.: +359 82 888 461 E-mail: vronkova@uni-ruse.bg

Abstract: This paper reviews a study of the preliminary general technical background of students enrolled in the first year of engineering bachelor degree courses studying Engineering Graphics. Depending on the type of the secondary education of the student, it was studied what part of them had prior training in Engineering Graphics or a similar subject. An analysis was made according to the year of completed secondary education and their enrollment in higher education. The results obtained are presented graphically. In the conclusions, the authors' team gives recommendations and guidelines for the implementation of a learning process in accordance with the incoming level of the students

Keywords: Engineering Graphics, Education, Training, Students, High School JEL Codes: C90

#### REFERENCES

Dobreva, A., Dimitrov, Y., Dobrev, V., Pantileev, P., Ronkova, V., Kamenov, K., Angelova, E. (2017). *Professional Realization of Students – Problems and Solutions*, Proceedings of University of Ruse, Vol 56 (4), pp. FRI-2.203-1-TMS-02, ISSN 1311-3321.

Dobreva, A. & Dimitrov, Y. (2012). Повишаване на ефективността на учебната работа чрез извънаудиторна дейност със студентите, Management & Sustainable Development, No 1, pp. 27-30, ISSN 1311-4506.

Haralanova, V. V. Ronkova. (2012). Appraising Methodology Concerning Students` Results in Course of Applied Geometry and Engineering Graphics. MENDELTECH INTERNATIONAL 2012 – International Scientific Conference, Brno, Czech Rrpublic, ISBN 978-80-7375-625-3.

Ivanova, M. (2008) Higher Education in Bulgaria and Human Resource Management -Perspectives and Challenges in the Context of the European Union Discussion papers (3). pp. 1-43. ISSN 1312-5079 (Оригинално заглавие: Иванова, М. (2008) Висшето образование в България и управлението на човешките ресурси - переспективи и предизвикателства в контекста на Европейския съюз. Дискусионни материали = Discussion papers (3). pp. 1-43. ISSN 1312-5079)

Kamenov, K., A. Dobreva, V. Ronkova. (2017). Advanced Engineering Methods in Design and Education.// Material Science and Engineeering, IOP Publishing, 2017, No 252, pp. 012033 - 37, ISSN 1757 - 8981. (SJR rank: 1/2017, IOP)

Kamenov, K., Dobreva, A. & Ronkova, V. (2016) *Interactive Technologies and New Teaching Models in Engineering Design based upon Multimedia Tools and Mobile Applications*, Fullpapers E-Book/4th World Congress on Education Research (WCER2016), No 1, pp. 90-95, ISSN 2258-6987.

Ronkova, V., A. Dobreva, K. Kamenov, V. Dobrev, Y. Dimitrov. (2016). *Increasing The Efficiency of The Study Process Through Imroving The Communication Activities Between Students And Lecturers*. Management and Sustainable Development, Year 18, Volume 59, 2016, No 4, pp. 77 - 82, ISSN 1311-4506.

Ronkova, V., (2020). *Development of Training in Engineering Graphics in Higher Schools*. University of Ruse, Ruse. pp 127. ISBN: 978-954-712-798-2

# A SIMPLE 1-D MODEL OF A SINGLE CYLINDER SI-ICE FOR COMBUSTION OF SOFC ANODE-OFF GASES

### **Tsvetomir Gechev, PhD student**

Department of Combustion engines, automobiles and transport, Technical University of Sofia, Bulgaria Phone: +359 02 965 2374 E-mail: tsvetomir.gechev@tu-sofia.bg

#### Assoc. Prof. Plamen Punov, PhD

Department of Combustion engines, automobiles and transport, Technical University of Sofia, Bulgaria Phone: +359 02 965 2374 E-mail: plamen\_punov@tu-sofia.bg

#### Assoc. Prof. Dalibor Barta, PhD

Department of Transport and Handling University of Žilina, Slovakia E-mail: dalibor.barta@fstroj.uniza.sk

**Abstract:** The paper presents a simple 1-D model of a single cylinder spark-ignited ICE created by means of the software product Ricardo WaveBuild. The model is applied for the combustion of the anode-off gases (AOG) emitted from a pre-defined solid oxide fuel cell (SOFC) stack that is modelled in a previous study of the authors. The geometrical and operating parameters of the stack and the engine, as well as the composition of the AOG for a fixed operating point of the stack, are presented. The model assumptions and the SOFC-ICE system integration for a cogeneration combined cycle, are briefly discussed.

Keywords: SOFC, AOG, Combustion, ICE, Combined cycle, Model

#### REFERENCES

Sapra, H., 2020. Combined gas engine-solid oxide fuel cell systems for marine power generation. Delft University of Technology. https://doi.org/https://doi.org/10.4233/uuid:12393b11-a4c3-4697-8757-2b2dbc1291ec

# USED ON REFRIGERANT PRESSURE IN AUTOMOTIVE AIR CONDITIONING SYSTEMS AS A DIAGNOSTIC PARAMETER

### Assoc. Prof. Georgi Kadikyanov, PhD

Department of Engines and vehicles, "Angel Kanchev" University of Ruse Phone: 082 888 526 E-mail: gkadikyanov@uni-ruse.bg

### Prof. Rosen Ivanov, DcS

Department of Engines and vehicles, "Angel Kanchev" University of Ruse Phone: 082 888 527 E-mail: rossen@uni-ruse.bg

### Chief Assist. Prof. Gergana Staneva, PhD

Department of Engines and vehicles, "Angel Kanchev" University of Ruse Phone: 082 888 526 E-mail: glstaneva@uni-ruse.bg

### Assist. Prof. Iliyana Minkovska, PhD

Department of Engines and vehicles, "Angel Kanchev" University of Ruse Phone: 082 888 526 E-mail: iminkovska@uni-ruse.bg

Abstract: This paper presents possibility of used various measured refrigerant pressures in automotive air conditioning systems as a diagnostic parameter. Automotive air conditioning systems have two lines (for low and high pressure). Depending on the particular malfunction in the air conditioning system, it usually responds by changing the pressures from normal in the low and high pressure lines. The measurement of these pressures can be used as a diagnostic parameter to detect various malfunctions.

The purpose of this paper is to analyze specific values of refrigerant pressures in automotive air conditioning systems to determine specific malfunctions.

Keywords: Automotive, Air conditioning systems, Refrigerant, Pressure JEL Codes: Q54

## REFERENCES

Agarwal, N. & Khan, E. (2018). Automobile Air Conditioning System. International Research Journal of Engineering and Technology. Vol. 05, Iss. 06. 2121-2125

Daly, S. (2006). Automotive Air Conditioning and Climate Control Systems. *Elsevier*, ISBN: 9780750669559, 362

Kumar, V., Saini, S., Sharma, M., Nigam, K., (2006). Pressure drop and heat transfer study in tube-in-tube helical heat exchanger. *Chemical Engineering Science*, 61, 4403 – 4416.

Rațiu, S., Laza, I, Alexa, V. & George, C. (2018). Practical studies on car air conditioning systems. *IOP Conference Series Materials Science and Engineering* 393(1):012073

# LIVE CYCLE ASSESMENT OF VEHICLE LITHIUM-ION BATTERIES

#### Angel Garev Dyndikov – PhD Student

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Tel.: +359 82 888 527 E-mail: angelgarev@mail.bg

### Assoc. Prof. Ivan Iliev Evtimov, PhD

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Phone: +359 82 888 527 E-mail: ievtimov@uni-ruse.bg

#### **Prof. Rosen Petrov Ivanov, DSc**

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Phone: +359 82 888 528 E-mail: rossen@uni-ruse.bg

**Abstract:** The presented work concerns analysis of the spent energy and GHG emissions for production of Lithium batteries. The contents of metals and other materials are regarded. Energy spent for production of materials and its recycling is estimated. Finally, the LCA of energy and harmful emissions is done, including all phases of production - from raw materials to completely finished batteries, with using of different types of fuel or energy (NG, electricity etc.)

Keywords: electric vehicle battery, Li-ion battery, energy consumption, GHG emissions

#### REFERENCES

Saeed Rahimpour Golroudbary, Daniel Calisaya-Azpilcueta, Andrzej Kraslawski. The Life Cycle of Energy Consumption and Greenhouse Gas Emissions from Critical Minerals Recycling: Case of Lithium-ion Batteries, ELSEVIER, 26th CIRP Life Cycle Engineering (LCE) Conference, Procedia CIRP 80 (2019) 316–321.

Qiang Dai, Jarod C. Kelly, Linda Gaines and Michael Wang. Life Cycle Analysis of Lithium-Ion Batteries for Automotive Applications. Batteries 2019, 5, 48; doi:10.3390/batteries5020048, p. 15.

Yuqing Wang, Ning An, Lei Wen et al. Recent progress on the recycling technology of Liion batteries. Elsevier, Journal of Energy Chemistry 55 (2021) 391–419.

Simon Davidsson Kurland. Energy use for GWh-scale lithium-ion battery production. Environ. Res. Commun. 2 (2020) 012001, p. 5.

https://research.chalmers.se/publication/524468/file/524468\_Fulltext.pdf

The European Power Sector in 2020. AN ANALYSIS BY Agora Energiewende Anna-Louisa-Karsch-Straße 2 | 10178 Berlin | DE, 202/02-A-2021/EN, Publication date: January 2021.

https://ember-climate.org/app/uploads/2022/01/European-Power-Sector-in-2020.pdf

# COMPARATIVE STUDY OF ENERGY CONSUMPTION AND ECOLOGICAL IMPACT OF MAIN TYPES OF CARS

#### Krasimir Minchev Kirilov – PhD Student

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Tel.: +359 82 888 527 E-mail: kkirilov@uni-ruse.bg

## Assoc. Prof. Ivan Iliev Evtimov, PhD

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Phone: +359 82 888 527 E-mail: ievtimov@uni-ruse.bg

# Prof. Rosen Petrov Ivanov, DSc

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Phone: +359 82 888 528 E-mail: rossen@uni-ruse.bg

**Abstract:** In this article analysis of the structure of Life cycle of different types of fuels is done. On the basis of the energy production for 2015 and 2020 years and energy mix of European countries an assessment of the energy consumption and GHG emissions of cars is done. LCA of cars using gasoline, natural gas, hydrogen fuel cells etc. show advantages and disadvantages of different type of vehicles, during its whole Life cycle.

Keywords: electric car, energy consumption, GHG emissions, Life cycle assessment, environmental protection

## REFERENCES

Evtimov. I, R.Ivanov, H. Stanchev, G. Kadikyanov, G. Staneva. (2020). Energy efficiency and ecological impact of the vehicles. *Ecology in Transport: Problems and Solutions*. © Springer Nature Switzerland AG 2020, ISBN 978-3-030-42322-3 ISBN 978-3-030-42323-0 (eBook)

Del Duce A, Egede P, Öhlschläger G, Dettmer T, Althaus H, Bütler T, Szczechowicz E (2013) *Guidelines for the LCA of electric vehicles*. http://www.elcar-

 $project.eu/fileadmin/dokumente/Guideline\_versions/eLCAr\_guidelines.pdf$ 

Share of electricity from renewable sources 2020.

https://ec.europa.eu/eurostat/statistics-explained/

index.php?title=File:Table\_2\_share\_of\_electricity\_from\_renewable\_sources\_2020.PNG

Greenhouse gas emission intensity of electricity generation in Europe. European Environment Agency.

https://www.eea.europa.eu/data-and-maps/indicators/overview-of-the-electricity-production-3/assessment

ICCT LCA study finds only battery and hydrogen fuel-cell EVs have potential to be very low-GHG passenger vehicle pathways. Green Car Congress. Energy, technologies, issues and policies for sustainable mobility, 2021.

https://www.greencarcongress.com/2021/07/20210721-icct.html

*The European Power Sector in 2020.* AN ANALYSIS BY Agora Energiewende Anna-Louisa-Karsch-Straße 2 | 10178 Berlin | DE, 202/02-A-2021/EN, Publication date: January 2021.

https://ember-climate.org/app/uploads/2022/01/European-Power-Sector-in-2020.pdf

## FRI-2.206-2-TMS-01

# STUDY OF ENERGY CONSUMPTION OF A CENTRAL DRIVE ELECTRIC BICYCLE ON A ROUTE

#### Nikolay Valeriev Dimitrow – PhD Student

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Tel.: +359 82 888 528 E-mail: nikolay.valeriev@abv.bg

#### **Prof. Rosen Petrov Ivanov, DSc**

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Phone: +359 82 888 528 E-mail: rossen@uni-ruse.bg

#### Assoc. Prof. Ivan Iliev Evtimov, PhD

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Phone: +359 82 888 527 E-mail: ievtimov@uni-ruse.bg

**Abstract:** Traffic in urban conditions is characterized by high intensity, frequent stops and starts, and prolonged idling of the engine. As a result of increased fuel consumption, air pollution with harmful emissions increases significantly. with the growing environmental problems and air pollution, the electric bicycle appears as a technological solution.

Presented article shows the results from a study of energy consumption of a bicycle with central drive on a route in town of Ruse. The obtained result are 10-15 times less than consumption of an electric car with one passenger. The level of emissions, in Bulgarian conditions, is approximately 4 g/km, which is significant less in comparison with electric car.

Keywords: electric bicycle, energy consumption, environmental protection

#### REFERENCES

Evtimov I., R.Ivanov (2016). *Electric vehicles*. Ruse, University of Ruse, p. 232, ISBN 978-954-712-682-4. (*Оригинално заглавие*: Евтимов И., Р. Иванов. Електромобили. Русе, Издателски център при РУ "Ангел Кънчев"-Русе, 2016, стр. 232).

Evtimov I., R.Ivanov (2016). *Motorcycles*. Ruse, University of Ruse, p. 247, ISBN 978-954-712-688-6. (*Оригинално заглавие*: Евтимов И., Р. Иванов. Мотоциклети. Второ издание. Русе, Издателски сентър на РУ, 2016, стр. 247)

www.actualno.com/interest/studenti-ot-ruse-syzdavat-unikalen-velosiped-naelektrichestvo-news\_21614.html

# COMPARATIVE STUDY OF ENERGY CONSUMPTION OF TWO TYPES ELECTRIC BICYCLE ON A ROUTE

#### Nikolay Valeriev Dimitrow – PhD Student

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Tel.: +359 82 888 528 E-mail: nikolay.valeriev@abv.bg

#### Prof. Rosen Petrov Ivanov, DSc

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Phone: +359 82 888 528 E-mail: rossen@uni-ruse.bg

### Assoc. Prof. Ivan Iliev Evtimov, PhD

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Phone: +359 82 888 527 E-mail: ievtimov@uni-ruse.bg

**Abstract:** for the growing environmental problems and air pollution, the electric bicycle appears as a good technological solution. There are two types of electric bicycles – with central driving system and gears, and with direct drive on a wheel. Every one of these conceptions have advantages.

In this study the energy consumption of two bicycles, using different driving system, are assessed. a typical city road is used for simultaneously motion of bicycles.

The results show a significant advantage of that system with central driving and gears. At the same conditions the energy consumption is significant low - from 12 to 28%, than respective of other bicycle (with driving wheel).

Keywords: electric bicycle, energy consumption, environmental protection

#### REFERENCES

Evtimov I., R.Ivanov (2016). *Electric vehicles*. Ruse, University of Ruse, p. 232, ISBN 978-954-712-682-4. (*Оригинално заглавие*:Евтимов И., Р. Иванов. Електромобили. Русе, Издателски център при РУ "Ангел Кънчев"-Русе, 2016, стр. 232).

Ivanov R., I. Evtimov, I. Milenov, O Krystev, K. Velkov. (2016). Electric vehicles for public transport. University of Ruse, p. 402, ISBN 978-954-712-691-6 (**Оригинално заглавие**: Иванов Р., Ив. Евтимов, Ив. Миленов, О. Кръстев, К. Велков. Електрически превозни средства за обществен транспорт. Русе, Издателски център при РУ "Ангел Кънчев", 2016, стр. 402).

https://eautomotors.alle.bg//
# MAIN PROBLEMS WITH THE RECYCLING OF RAILWAY SLEEPERS TYPES

#### Ivan Kirilov Omayski – PhD Student

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Tel.: +359 E-mail: ivan1967bg@abv.bg

#### Prof. Rosen Ivanov, DSc

Department Engines and Vehicles, University of Ruse "Angel Kanchev" Phone: +359 82 888 528 E-mail: rossen@uni-ruse.bg

**Abstract:** This article addresses issues related to the materials of the railway sleepers and their recycling. The properties of diffrenet sleeper types - wooden, iron, steel, reinforced concrete and plastic are considered.

Recycling of the sleepers is one question that is relevant to environmental protection and is necessary to pay attention to this issue. Every year, a very large number of sleepers come out of use and therefore it is important to develop methods of recycling or re-use of materials. In the article, an analysis of the state of this problems has been made, regarding worldwide experience and existing methodes. a conclusion is made.

Keywords: sleepers, recycling, re -use, environmental protection

#### REFERENCES

Adrian Bednarczyk (2020), Foslo Fastening Systems GmbH 05 (*Оригинално заглавие*: Адриан Беднарчик, Фосло Фасънинг Системс ГмбХ 05 Декември 2020.) https://gradat.bg/produkti-i-tehnologii/smart-alternativata-na-drvenite-i-plastmasovi-traversi

Report of Technocomplex Company on Empirical Combustion (2019) (*Оригинално заглавие*: Доклад на Компания Технокомплекс за емпирично изгарияне. 2019-04-20) https://shr32.ru/bg/about-teeth/utilizaciya-shpal-derevyannyh-obzor-razlichnyh-sposobov-utilizaciya/

Environmental aspects solved with the technology of Rail Recycling Ltd, (2020). (Оригинално заглавие: Екологични аспекти разрешавани с технологията на Рейл Рисайклинг ООД. 2020) http://rail-recycling.com/bg/ecology.php

Railwaymodel, The railway history of Europe, (2013), (Оригинално заглавие:Railwaymodel, Железопътната история на Европа.https://railwaymodel.blog.bg/hobi/2013/06/13/jelezopytnata-istoriia-na-evropa.1119779

Wojciechowski Andrzej, Doliński Adam, Maria Radziszewska-Wolińska Jolanta, Marta Wołosiak, (2018) Environmentally Friendly Recycling of Wooden Railway Sleepers. Problemy Kolejnictwa - Railway Reports, ISSN 0552-2145 (print) ISSN 2544-9451, p. 139-146

# MOTOR PROPERTIES OF ISOPROPANOL, AS A FUEL FOR INTERNAL COMBUSTION ENGINES

#### 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

**Abstract:** The paper reviews physicochemical properties of isopropanol, used as alternative fuel for SI ICE. In this work are described composition (C, H, O), stoichiometric air/fuel ratio, lower heating value, laminar burning velocities, oktane numbers, viscosity, specific gravity and others. It is established wich alcohol, improve mixture properties with gasoline. 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 fore cylinder port fuel injection (PFI) test gasoline engine.

*Keywords:* Sparc ignition internal combustion engine, Isopropanol, Lower heating value, Stoichiometric air/fuel ratio, Laminar burning velocities

### REFERENCES

A.I.Dimitrov Alternative fuels in ICE-solutions and problems. TU Varna, Machines, Technologies, Materials, № I-2007

A.M.Danilov. E.F.Kaminskii, V.A. Xavkin "Alternativnui topliva: dostoinstva i nedostatki.Problemui Primenenia"YDK (665.7032.52/54+662.767):665.633

H S Farkade, a P Pathre. Experimental investigation of methanol, ethanol and butanol blends with gasoline on SI engine.International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459, Volume 2, Issue 4, April 2012)

Ronald Timpe, Ted Aulich, Comparison of Carbon Dioxide Emissions from Gasoline and E85. Report to American Lung Association of Minnesota – Clean Air Fuels Alliance. University of North Dakota Energy & Environmental Research Center 12 January 2005

Xadjiev,K.,Stankov, E., "Butanolat-alternativno gorivo za dvigatelite s prinuditelno vazplamenqvane" – Nauchni trudove na RU" A.Kanchev", Ruse 2010, str.29-32, ISSN 1311-3321.

# IMPROVEMENT OF THE PARAMETERS OF INTERNAL COMBUSTION ENGINES WHEN WORKING WITH BIODIESEL FUEL

Assoc. Prof. Atanas L. Iliev, PhD Department of Engines and transport technology "Angel Kanchev" University of Ruse Phone: 082-888 273 E-mail: ailiev@uni-ruse.bg

**Abstract:** Ever since the first oil crisis in 1973-1974, it has become clear to humanity that one cannot rely only on oil as a source of fuel for the transport sector. Although biofuels are still seen as an alternative, their use is necessitated by the ever-increasing prices of fossil fuels and their imminent depletion, as well as by global goals to reduce greenhouse gas emissions and protect the environment. Nowadays, the question is no longer whether biofuels should be used in internal combustion engines, but what structural changes should be made in the engines so that when working with them, the best possible performance, economic and environmental performance can be achieved.

Unlike conventional diesel fuel, biofuels have a high  $O_2$  content in their molecule. This leads to an increase in the air ratio in the over-enriched combustion zone, as a result of which the rate of soot formation is reduced. with an increase in the proportion of oxygen in the fuel, the duration of the self-ignition retention period increases and the rate of heat release increases during the period of rapid combustion, as a result of which the concentration of NOX in the exhaust gases increases.

Keywords: Improvement, ICS, Biodiesel Fuel JEL Codes: L10, L11

#### REFERENCES

Iliev A., M. Ivanova, E. Marinov, S. Penchev (2013). Using a multifactorial planned experiment to optimize diesel engine performance with different bioblends. NTK, Transport, ecology - sustainable development, Eco Varna;

Ivanova M., E. Marinov (2008). Biodiesel as an alternative fuel. Scientific works of Ruse University - 2008, volume 47, series 4, Print base of Ruse University, pp. 21-25, ISBN 1311-3321.

Ivanova M., E. Marinov (2009). Investigation of fuel consumption in different agricultural operations and different percentage of biodiesel fuel. Scientific works of Ruse University - 2009, volume 48, series 4, Print base of Ruse University, pp. 63-64, ISBN 1311-3321

Ivanova M. - Marinov E (2010) . Comparative analysis of the physico-chemical properties of biofuels. Quality and reliability of technical systems. Nitra, pages 333-336, ISBN 978-80-552-0390-4

# "GREEN" HYDROGEN AS AN ALTERNATIVE TO FOSSIL FUELS FOR INTERNAL COMBUSTION

#### Assoc. Prof. Atanas Iliev, PhD

Department of Engines and transport technology "Angel Kanchev" University of Ruse Phone: 082-888 273 E-mail: ailiev@uni-ruse.bg

**Abstract:** for the European Union to be able to reduce its net emissions to zero and contribute to a cleaner planet, a complete change of the energy mix in Europe will be needed. According to the European Green Deal, the transition will have to be combined with the provision of clean, affordable and secure energy for businesses and consumers. Energy is a problem area for Europe. In 2018, energy production and consumption accounted for 75% of EU greenhouse gas emissions. About 58% of energy consumption depended on imports, mostly oil and natural gas. The European Commission proposed in July 2020 a strategy for the use of hydrogen to achieve a climate neutral Europe. The aim is to increase the production of hydrogen from clean sources and establish it as a key element in the energy system by 2050.

There are different ways of extracting hydrogen, which lead to the emission of different amounts of greenhouse gases. Pure hydrogen, also called renewable or "green" hydrogen, is produced by electrolysis - passing an electric current through water. The electricity used should be from renewable sources. No greenhouse gases are emitted in this process. for the time being, hydrogen has little relevance to the overall energy mix. The challenges are related to reducing production costs, increasing the scale of production, developing the necessary infrastructure and ensuring the safety of use. On the other hand, hydrogen can facilitate the development of an emission-free transport sector, heating and industrial production, as well as long-term energy storage.

Keywords: Green Hydroge, Alternative, Fossil fuels, ICS JEL Codes: L10, L11

### REFERENCES

https://www.europarl.europa.eu/news/bg/headlines/priorities/klimatichniteizmeneniia/20180109STO91387/chista-energhiia-es-postavia-aktsent-vrkhu-vzobnoviaemiteiztochnitsi-i-efektivnostta;

https://www.europarl.europa.eu/news/bg/press-room/20210519IPR04310/meps-advocate-push-for-renewable-hydrogen-integration-of-energy-systems;

https://nangs.org/news/renewables/hydrogen/zelenyj-vodorod-stanovitsya-bolshoj-i-neudobnoj-problemoj;

https://tass.ru/obschestvo/13271849?;

https://energyline.com.ua/drugie-publikacii/chto-takoe-zelenyj-vodorod/;

http://cigre.ru/news/rnk/13027/

https://minobrnauki.gov.ru/press-center/news/nauka/55278/

## ENGINE DEVELOPMENT IN VIRTUAL ENVIRONMENT

#### M. Eng. Ivaylo Nikolaev Borisov, PhD student,

Department of Engines and Vehicles, University of Ruse "Angel Kanchev" Tel.: 0888 469 868 E-mail: iborisov@uni-ruse.bg

#### Assoc. Prof. Simeon Iliev, PhD

Department of Engines and Vehicles, Univesity of Ruse "Angel Kanchev" Phone: +359 82 888 331 E-mail: spi@uni-ruse.bg

**Abstract:** Internal combustion engines have been in use for over 150 year. There is still room for improvement in efficiency and emission reduction. Constant improvements will ensure the future existence of the internal combustion engine. The design of the engine of the future is becoming more complex and demanding. to meet these demands a combination of development tools is required one dimensional (1D) and three dimensional (3D) computational fluid dynamic simulations, so that more concepts and ideas can be investigated, and at the same time using the least amount of resources.

Keywords: 1D, 3D, Simulations, CFD, Effectiveness

### REFERENCES

Iliev S. (2021) a Comparison of Ethanol, Methanol, and Butanol Blending with Gasoline and Its Effect on Engine Performance and Emissions Using Engine Simulation. Processes.; 9(8):1322.

Iliev, S. & Mitev, E. (2019). Modelling and Investigation of a Diesel Engine with Ethanol and Methanol Additives, Proceedings of the 30th DAAAM International Symposium, pp.0415-0423,

Iliev, S. (2020). Investigation of the Gasoline Engine Performance and Emissions Working on Methanol-Gasoline Blends Using Engine Simulation, Numerical and Experimental Studies on Combustion Engines and Vehicles, Paweł Woś and Mirosław Jakubowski, IntechOpen.

Iliev S. (2014) Developing of a 1-D Combustion Model and Study of Engine Characteristics Using Ethanol-Gasoline Blends, Proceedings of the World Congress on Engineering 2014, Vol II, WCE 2014, Jully 2-4, London, U.K.

# DIMETHYL ETHER APPLICATIONS IN COMPRESSION IGNITION ENGINES

#### **Dimitar Obretenov – PhD Student**

Department of Engines and Vehicles, University of Ruse "Angel Kanchev" Tel.: + 359 88 3533556 E-mail: di.obretenov@abv.bg

### Assoc. Prof. Simeon Iliev, PhD

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

**Abstract:** In recent years, more and more stringent requirements have been introduced for vehicles with internal combustion engines on emissions. The energy crisis and the surge in fuel prices led to the search for alternative sources of energy and fuels. Dimethyl ether (DME), as a synthetic fuel, is one of the alternative options that would find application in the fight to reduce harmful emissions from transport. DME is a clean fuel and its use in the transport sector would reduce pollution especially in large cities with intensive transport.

Keywords: Dimethyl ether, ICE, Alternative Fuels, Emissions, DME

## REFERENCES

Iliev S. (2021) a Comparison of Ethanol, Methanol, and Butanol Blending with Gasoline and Its Effect on Engine Performance and Emissions Using Engine Simulation. Processes.; 9(8):1322.

Iliev, S. & Mitev, E. (2019). Modelling and Investigation of a Diesel Engine with Ethanol and Methanol Additives, Proceedings of the 30th DAAAM International Symposium, pp.0415-0423,

Iliev, S. (2020). Investigation of the Gasoline Engine Performance and Emissions Working on Methanol-Gasoline Blends Using Engine Simulation, Numerical and Experimental Studies on Combustion Engines and Vehicles, Paweł Woś and Mirosław Jakubowski, IntechOpen.

Iliev S. (2014) Developing of a 1-D Combustion Model and Study of Engine Characteristics Using Ethanol-Gasoline Blends, Proceedings of the World Congress on Engineering 2014, Vol II, WCE 2014, Jully 2-4, London, U.K.

## ETHANOL AS AN ALTERNATIVE FUEL FOR DIESEL ENGINES

#### M. Eng. Emil Mitev, PhD Student

Department of Engines and Vehicles "Angel Kanchev" Univesity of Ruse Tel.: +359 89494 9777 E-mail: emitev@uni-ruse.bg

#### Assoc. Prof. Simeon Iliev, PhD

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

**Abstract:** In recent years, more and more stringent requirements have been introduced for vehicles with internal combustion engines on emissions. The search and development of synthetic and natural alternative fuels worldwide has become increasingly large-scale in recent years. The largest share is occupied by alcohols and, in particular, ethanol. Ethanol is currently the most widely used liquid biofuel.

Keywords: Ethanol, ICE, Alternative Fuels, Emissions, Diesel Engine

### REFERENCES

Iliev S. (2021) a Comparison of Ethanol, Methanol, and Butanol Blending with Gasoline and Its Effect on Engine Performance and Emissions Using Engine Simulation. Processes.; 9(8):1322.

Iliev, S. & Mitev, E. (2019). Modelling and Investigation of a Diesel Engine with Ethanol and Methanol Additives, Proceedings of the 30th DAAAM International Symposium, pp.0415-0423,

Iliev, S. (2020). Investigation of the Gasoline Engine Performance and Emissions Working on Methanol-Gasoline Blends Using Engine Simulation, Numerical and Experimental Studies on Combustion Engines and Vehicles, Paweł Woś and Mirosław Jakubowski, IntechOpen.

Iliev S. (2014) Developing of a 1-D Combustion Model and Study of Engine Characteristics Using Ethanol-Gasoline Blends, Proceedings of the World Congress on Engineering 2014, Vol II, WCE 2014, Jully 2-4, London, U.K.

### FRI-20.25-1-SITSTL-01

# PUBLIC TRANSPORT AND NOISE ASPECTS – CRUCIAL PROBLEMS IN DEVELOPING OF URBAN PASSENGER SYSTEMS

#### Aleksandar Georgiev, PhD student

Department of Transport, "Angel Kanchev" University of Ruse Phone: +359 888 860 009 E-mail: aggeorgiev@uni-ruse.bg

**Abstract:** The paper focuses on problems of sustainable development of transport systems with special attention paid to noise pollution. Solutions to reduce noise pollution are among the essentials to consider when determining the basic parameters of a transport scheme.

*Keywords:* noise pollution, city logistics; technological innovations; environmental sustainability; urban transport; urban passenger systems *JEL Codes:* R41, Q53

#### REFERENCES

Yi Fan, Ho Pin Teo, Wayne Xinwei Wan (2019). Public Transport, Noise Complaints, and Housing: Evidence from Sentiment Analysis in Singapore, URL:

https://www.aeaweb.org/conference/2020/preliminary/paper/Z5n5a274

Marianna Jacyna, Mariusz Wasiak, Konrad Lewczuk, Grzegorz Karoń (2017). Noise and environmental pollution from transport: decisive problems in developing ecologically efficient transport systems, URL: https://doi.org/10.21595/jve.2017.19371

Syaiful Syaiful, Iswahyudi Iswahyudi (2020). Noise Caused by the Volume of Public Transport and Private Transportation during COVID-19, URL: https://doi.org/10.35741/issn.0258-2724.55.5.30

Julie Méline, Andraea Van Hulst, Frédérique Thomas, Noëlla Karusisi & Basile Chaix (2013). Transportation noise and annoyance related to road traffic in the French RECORD study, URL: https://ij-healthgeographics.biomedcentral.com/articles/10.1186/1476-072X-12-44

EEA Web Team (2009). Turn down the noise - softening the impact of excess transport noise, URL: https://www.eea.europa.eu/articles/turn-down-the-noise-2013-67-million-europeans-endure-high-transport-noise-exposure

# OPPORTUNITIES FOR IMPROVING PASSENGER TRANSPORT BY RAIL TRANSPORT IN THE REPUBLIC OF BULGARIA

#### Chief Assist. Pavel Stoyanov, PhD

Department of Transport, "Angel Kanchev" Univesity of Ruse Tel.: +359 82 888 515 E-mail: pstoyanov@uni-ruse.bg

**Abstract:** The article examines the current state of passenger rail transport in Bulgaria. for this purpose, an analysis of the state of the transport infrastructure and transport services for transporting passengers by rail was made. The potential and forecasts for the development of passenger transport by rail were examined, as well as the measures to improve the service. After that, an analysis of the effects of the improvement of passenger transport by rail was made.

*Keywords:* Rail transport, Passenger transport, Quality of service *JEL Codes:* L10, L11

#### REFERENCES

Varadinova Y, Models for Sustainable Development of Railway Infrastructure, Dissertation, VTU Todor Kableshkov, Sofia 2014 (*Оригинално заглавие:* Варадинова Ю, Модели за устойчиво развитие на железопътната инфраструктура, дисертационен труд, ВТУ "Тодор Каблешков", София, 2014.)

Integrated transport strategy in the period up to 2030. (*Оригинално заглавие:* Интегрирана транспортна стратегия в периода до 2030 г.)

BDZH "Patnicheski prevozi" – ofitsialen sayt, dostapen na: https://www.bdz.bg (*Оригинално заглавие:* БДЖ "Пътнически превози" – официален сайт, достъпен на: https://www.bdz.bg)

Minkov, T., 2019. Politiki za razvitie na zhelezopatnia transport v Bulgaria – osnovni tseli i rezultati. Ikonomicheski i sotsialni alternativi, br. 4 (*Оригинално заглавие:* Минков, Т., 2019. Политики за развитие на железопътния транспорт в България – основни цели и резултати. Икономически и социални алтернативи, бр. 4.)

Annual report on the activities of the Executive Agency "Railway Administration " IA DJA, 2018 (*Оригинално заглавие:* Годишен доклад за дейността на Изпълнителна агенция "Железопътна администрация", ИА "ЖА", 2018)

National Statistical Institute 2022 - https://nsi.bg/sites/default/files/files/publications ( *Оригинално заглавие:* Национален статистически институт https://nsi.bg/sites/default/files/files/publications)

The restructuring of the railway sector in the Republic of Bulgaria, report on specific position 1 "Assessment of market demand for passenger railway services and proposal of measures for improvement", InfraKear – TransKear DZZD, 2013 (*Оригинално заглавие:* Преструктурирането на железопътния сектор в Република България, доклад по обособена позиция 1 "Оценка на пазарното търсена на пътническите железопътни услуги и предложение на мерки за подобряване", "ИнфраКеър – ТрансКеър" ДЗЗД, 2013.)

Strategy for the development of railway transport in the Republic of Bulgaria and plan for the recovery and development of the "Holding Bulgarian State Railways" EAD group, project for the period 2015 – 2022 (*Оригинално заглавие:* Стратегия за развитие на железопътния транспорт в Република България и план за оздравяване и развитие на групата на "Холдинг български държавни железници" ЕАД, проект за периода 2015 – 2022 г)

European Transport Commission -

https://ec.europa.eu/commission/presscorner/detail/bg/ip\_21\_6776 (*Оригинално заглавие:* Европейска комисия по транспорта https://ec.europa.eu/commission/presscorner/detail/bg/ip\_21\_6776)

# ASSESSMENT OF THE POSSIBILITIES FOR IMPROVING THE PASSAGE OF TRANSPORT FLOWS THROUGH A BUSY SECTION OF THE STREET NETWORK OF THE CITY OF SOFIA

### **Dimityr Stefanin, Student**

Department of Combustion Engines, Automobile Engineering and Transport, Technical University of Sofia, Bulgaria Tel.: +359 (2) 965-2308 E-mail: d.h.stefanin@gmail.com@gmail.com

### Ass. Prof. Georgi Mladenov, PhD

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

**Abstract:** The main problem that is considered in the report is related to improving the conditions of passage through an extremely busy section of the street network in the city of Sofia during peak periods. Traffic is carried out in one lane per direction. The presence of bus stops on both sides of the section creates difficulties in the case of a stopped bus, which prevents the passage of cars from the respective lane. This creates queues that prevent the normal flow of traffic flows. On the basis of studies of traffic parameters, options for building an additional traffic lane or pull-out stops for buses are being evaluated. The results provide a basis for proposals that are expected to bring significant benefits to improving the passage of vehicles through this section.

Keywords: Bus stops, Pull-Out stops, additional traffic line, Traffic queue

#### REFERENCES

Тоdorov, Т. (1982). Urban planning, urban traffic and street network. Sofia: Tehnica, 51-52. (Оригинално заглавие: Тодоров, Т., 1982. Градоустройство, градско движение и улици. София: Издателство "Техника".)

Zlatanov, I. (1985). Road traffic organization and safety. Sofia: Tehnica, 155-178. (**Оригинално заглавие:** Златанов, И., 1985. Организация и безопасност на движението. София: Издателство "Техника".)

Damyanov, I., Mladenov, G., Savova-Mratsenkova, M., Palagachev, G., Hristov, V., (2017). *Examination of interaction between carriage and transport flows for improving the organization and the safety of movement*, Proc. Conf. BulTrans – Sozopol 2017, Technical University Academic Publishing House (**Оригинално заглавие:** Дамянов, И., Младенов, Савова-Мраенкова, М.,Г., Палагачев, Г., Христов, В. 2017. *Изследване взаимодействието между пешеходни и транспортни потоци за подобряване на организацията и безопасността на движението*, Научна конференция с международно участие по авиационна, автомобилна и железопътна техника и технологии БулТранс-2017, Созопол, Сборник доклади, София: Издателство на Техническия университет – София) ISSN 1313-955X, 118-121.

Lin L., etc., (2016). *Evaluation of a Public Transport Priority Methodology*, Series: Advances in Social Science, Education and Humanities Research, Proceedings of the 2016 International Forum on Management, Education and Information Technology Application, https://doi.org/10.2991/ifmeita-16.2016.18.

Ma D., etc., (2012). a *Method for Queue Length Estimation in an Urban Street Network Based on Roll Time Occupancy Data*, Mathematical Problems in Engineering, Special Issue: Modeling and Simulation in Transportation Engineering, https://doi.org/10.1155/2012/892575.

Ministry of Regional Development and Public Works. (2022). *Territory development law*, The State Gazette was published. No. 1 of January 02, 2001, as amended by the State Gazette No. 94 of Nowember 12 2021 and supplemented by the State Gazette No. 42 of 07 June 2022. (**Оригинално заглавие**: Министерство на регионалното развитие и благоустройството, 2022. *Закон за устройство на територията*, Обн. ДВ. бр.1 от 02 Януари 2001г., изм. ДВ. бр.94 от 12 Ноември 2021 г., доп. ДВ. бр.42 от 07 Юни 2022 г.) Availabel on 12.10.2022 at: https://www.lex.bg/laws/ldoc/2135163904.

Мinistry of Regional Development and Public Works. (2022). *Regulation no. rd-02-20-2 of december 20, 2017 on planning and designing the communication and transportation system of urbanized territories*, The State Gazette was published. No. 7 of January 19, 2018, as amended and supplemented by the State Gazette No. 79 of October 04 2022. (**Оригинално заглавие**: Министерство на регионалното развитие и благоустройството, 2022. *Наредба № рд-02-20-2 от 20 декември 2017 г. за планиране и проектиране на комуникационно-транспортната система на урбанизираните територии*, Обн. ДВ. бр.7 от 19 Януари 2018г., изм. и доп. ДВ. бр.79 от 04 Октомври 2022 г.) Availabel on 12.10.2022 at: https://lex.bg/en/laws/ldoc/2137180231.

National Association of City Transportation Officials. (2022). Transit Street Design Guide, *Platform Length*. URL: https://nacto.org/publication/transit-street-design-guide/stations-stops/stop-design-factors/platform-length/ (Accessed on 12.10.2022).

Global Designing Cities Initiative (2022). Guides & Handbooks. *Stop Types*. URL: https://globaldesigningcities.org/publication/global-street-design-guide/designing-streets-people/designing-transit-riders/transit-stops/stop-types/ (Accessed on 12.10.2022)

Association of State Road Transport Undertakings (ASRTU). (2015). Bus Terminal Design Guidelines. SGArchitects. New Delhi-110 070.

Logeswaran, S. (2017). *Design Standards for Planning a Bus Terminus*. International Journal of Advanced Research in Basic Engineering Sciences and Technology (IJARBEST) Vol.3, Special Issue.24, March 2017. ISSN (ONLINE): 2395-695X. ISSN (PRINT): 2395-695X.

# ASSESSMENT OF PARKING IN THE STUDENTSKI GRAD QUARTER IN THE CITY OF SOFIA

#### Sandrina Babcheva, Student

Department of Combustion Engines, Automobile Engineering and Transport, Technical University of Sofia, Bulgaria Tel.: +359 (2) 965-2308 E-mail: sandrinatotalova@gmail.com

#### Assoc. Prof. Durhan Saliev, PhD

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

### Assoc. Prof. Iliyan Damyanov, PhD

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

### Ass. Prof. Georgi Mladenov, PhD

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

**Abstract:** The publication presents a study of parked cars in a Studentski grad district in the capital of the Republic of Bulgaria. The aim is to determine the necessary number of parking spaces, which are not enough considering those who wish to park in the studied area. The representative study is the basis for making adequate decisions, the applications of which will improve the parking conditions in the neighborhood.

Keywords: Parking, Parking conditions, Parking planning

### REFERENCES

The mobility Group. (2000). L. A. Sports & Entertainment District EIR Traffic Study. Parking Analysis. DEIR Report, Kaku Assosiates, 64-73.

Yagcitekin, B., Uzunoglu, M., Karakas, A., Vurgun, M. (2013). Assessment of a Car Park with Electric Vehicles, Conference Paper · May 2013, DOI: 10.1109/PowerEng.2013.6635740.

Abdullah, D., Al Qarni, M., Al Farei, Z., Yahia, H. (2018). Assessment of parking space demand in knowledge oasis muscat, case study of middle east college, 8th National Symposium on Engineering Final Year Projects.

Naser, L., Shpetim, L, Ilir, D.,. (2017). *The methodology for vehicles parking analysis: case study – cityof prishtina*. International scientific journal "machines. Technologies. Materials., Web ISSN 1314-507x; Print ISSN 1313-0226, Year XI, ISSUE 10, p.p. 499-503 (2017).

Mei, Z., Feng, C., Kong, L., Zhang, L., Chen, J. (2020). Assessment of Dierent Parking Pricing Strategies: a Simulation-based Analysis. Sustainability 2020, 12, 2056; doi:10.3390/su12052056.

Samaranayake, J., Gunawardana, U. (2022). Parking Assessment in the Context of Growing Construction Activity and Infrastructure Changes: Simulation of Impact Scenarios. Sustainability 2022, 14, 5098. https://doi.org/10.3390/su14095098.

Ministry of Regional Development and Public Works. (2022). *Territory development law*, The State Gazette was published. No. 1 of January 02, 2001, as amended by the State Gazette No. 94 of Nowember 12 2021 and supplemented by the State Gazette No. 42 of 07 June 2022. (**Оригинално заглавие**: Министерство на регионалното развитие и благоустройството, 2022. *Закон за устройство на територията*, Обн. ДВ. бр.1 от 02 Януари 2001г., изм. ДВ. бр.94 от 12 Ноември 2021 г., доп. ДВ. бр.42 от 07 Юни 2022 г.) Availabel on 12.10.2022 at: https://www.lex.bg/laws/ldoc/2135163904.

Ministry of Regional Development and Public Works. (2022). Regulation no. rd-02-20-2 of december 20, 2017 on planning and designing the communication and transportation system of urbanized territories, The State Gazette was published. No. 7 of January 19, 2018, as amended and supplemented by the State Gazette No. 79 of October 04 2022. (Оригинално заглавие: Министерство на регионалното развитие и благоустройството, 2022. Наредба № рд-02-20-2 от 20 декември 2017 г. за планиране и проектиране на комуникационно-транспортната система на урбанизираните територии, Обн. ДВ. бр.7 от 19 Януари 2018г., изм. и доп. ДВ. бр.79 04 Октомври 2022 г.) Availabel on 12.10.2022 от at: https://lex.bg/en/laws/ldoc/2137180231.

# RESEARCH OF THE MOVEMENT SPEEDS OF CYCLISTS BY SECTION OF BICYCLE INFRASTRUCTURE

Assist. Prof. Toncho Balbuzanov, PhD Department of Transport, "Angel Kanchev" Univesity of Ruse Phone: (+359) 082 888 608 E-mail: tbalbuzanov@uni-ruse.bg

**Abstract:** This report presents the results of a study conducted on the speed of movement of a cyclist in a section of bicycle infrastructure in the city of Ruse. The section is part of the bicycle network in the city of Ruse, connecting the residential districts "Rodina 3" and "Charodeyka-sever". The specific study was conducted with the aim of establishing the speed of movement of a cyclist in the individual points of the studied section. The section connecting the two residential districts has a length of 700 m and an elevation of 44 m. In its current state, it is difficult to climb for over 80% of cyclists passing through it, which has an impact on the choice of this mode of transport by the city's residents. In cities with a well-developed bicycle network, this type of transport is accepted by a larger part of their inhabitants, and is gaining popularity.

*Keywords: bicycle infrastructure, bicycle network, bicycle transport. JEL Codes: R*41

### REFERENCES

John Parkin, Jonathon Rotheram (2010), *Design speeds and acceleration characteristics of bicycle traffic for use in planning, design and appraisal*, Transport Policy, Volume 17, Issue 5, 335-341

Pablo Jensen, Jean-Baptiste Rouquier, Nicolas Ovtracht, Céline Robardet (2010), *Characterizing the speed and paths of shared bicycle use in Lyon*, Transportation Research Part D: Transport and Environment, Volume 15, Issue 8, 522-524

Piet Rietveld, Vanessa Daniel (2004), *Determinants of bicycle use: do municipal policies matter?*, Transportation Research Part A: Policy and Practice, Volume 38, Issue 7, 531-550

Toncho Balbuzanov (2021), Research of some sections of bicycle infrastructure in the city of Ruse, Proceedings of University of Ruse - 2021, volume 60, book 4.2., 151-156

Shinhye Joo, Cheol Oh, Eunbi Jeong, Gunwoo Lee (2015), *Categorizing bicycling environments using GPS-based public bicycle speed data*, Transportation Research Part C: Emerging Technologies, Volume 56, 239-250

Sign up for the bike: design manual for a cycle-friendly infrastructure. CROW, 1993.

Design Manual for Cycle Traffic, CROW, The Netherlands (2006)

# CHALLENGES IN PLANNING HYDROGEN CHARGING INFRASTRUCTURE FOR FUEL CELL ELECTRIC VEHICLES (CASE STUDY FROM THE CITY OF RUSE)

#### Prof. Velizara Pencheva, PhD

Department of Transport, University of Ruse Tel.: +359888293341 E-mail: vpencheva@uni-ruse.bg

### Assoc. Prof. Asen Asenov, PhD

Department of Transport, University of Ruse Tel.: +35982888608 E-mail: asasenov@uni-ruse.bg

#### Aleksandar Georgiev, PhD student

Department of Transport, "Angel Kanchev" University of Ruse Phone: +359 888 860 009 E-mail: aggeorgiev@uni-ruse.bg

**Abstract:** Hydrogen can power transportation with almost zero greenhouse gas emissions. The technological advances in fuel cell vehicles and electricity generation from renewable energy is underpin early market development in a number of countries. At the same time, the deployment of a sustainable hydrogen refueling infrastructure is faces of methodological and practical challenges, ranging from determining a physical location for its deployment to the availability of fuel cell vehicles.

The paper reviews the challenges facing the planning of the first hydrogen charging infrastructure in the city of Ruse and the prospects for the future. Infrastructure costs depend on how hydrogen is produced and delivered to refueling stations. The methods for planning the capacity and the location of the first station for refueling vehicles with hydrogen are unknown in Bulgaria, including the need to overcome a number of barriers (normative, institutional, economic, social, etc.).

*Keywords:* transport hub, hydrogen refueling, fuel cell electric vehicles, hydrogen transition, hydrogen refueling station *JEL Codes:* 

### REFERENCES

Bartona J., R. Gammonb. The production of hydrogen fuel from renewable sources and its role in grid operations. Journal of Power Sources Volume 195, Issue 24, 2010, Pages 8222-8235

Canan Acar, Ibrahim Dincer. Review and evaluation of hydrogen production options for better environment. Journal of Cleaner Production. Volume 218, 2019, Pages 835-849.

Jovan D., G. Dolanc. Can Green Hydrogen Production Be Economically Viable under Current Market Conditions. Energies 2020, 13(24), 6599; https://doi.org/10.3390/en13246599.

Lia L., ,H. Maniera, M. Maniera. Integrated optimization model for hydrogen supply chain network design and hydrogen fueling station planning. Computers & Chemical Engineering. Volume 134, 2020, 106683

Moradi R., K.Groth. Hydrogen storage and delivery: Review of the state of the art technologies and risk and reliability analysis. International Journal of Hydrogen Energy. Volume 44, Issue 23, 3 May 2019, Pages 12254-12269

Nikolaidis P. a comparative overview of hydrogen production processes. Renewable and Sustainable Energy Reviews Volume 67, 2017, Pages 597-611.

Navas-Anguita Z., D. García-Gusano, J. Dufour D. Iribarrena. Prospective techno-economic and environmental assessment of a national hydrogen production mix for road transport. Applied Energy. Volume 259, 2020, 114121.

Rivard E., M. Trudeau, K. Zaghib. Hydrogen Storage for Mobility: a Review. Materials. 2019, volume 12/ Issue 12 /doi:10.3390/ma12121973.

Samsun R, M. Rex, L. Antoni, D Stolten. Deployment of Fuel Cell Vehicles and Hydrogen Refueling Station Infrastructure: a Global Overview and Perspectives. Energies 2022, 15, 4975. https://doi.org/10.3390/en15144975

Wulf Ch, M. Kaltschmitt. Hydrogen Supply Chains for Mobility—Environmental and Economic Assessment. Sustainability 2018, 10, 1699; doi:10.3390/su10061699

Zettel A. Hydrogen storage methods. Naturwissenschaften (2004) 91:157–172. DOI 10.1007/s00114-004-0516-x

# COMPARATIVE ANALYSIS OF EDUCATION IN TRANSPORT SPECIALTY AT THE UNIVERSITY OF RUSE AND THE UNIVERSITY POLITEHNICA OF BUCHAREST

## Assoc. Prof. Asen Asenov, PhD

Department of Transport, University of Ruse Phone: +359 82 888 635 E-mail: asasenov@uni-ruse.bg

### Assoc. Prof. Oana Dinu, PhD

Department Transport, traffic and logistics, University Politehnica of Bucharest Phone: +40745504092 E-mail: oana.dinu@upb.ro

**Abstract:** In the paper, a comparative analysis was made between the curricula in the educational and qualification degree "bachelor" of the study specialty related to the organization, logistics, technologies and management of transport at the University of Ruse and the University Politehnica of Bucharest. The similarities and differences in the disciplines, horariums, ECTS credits and forms of study from the two curricula are determined.

The development of transport science and practice, the internationalization of higher education, including international mobility (Erasmus and others) require the development of comparative analyzes between different curricula that allow the recognition of learning stages (ECTS credits and others). They also allow the transfer of good practices in terms of training (theoretical, practical)..

**Keywords:** Curriculum; Educational and qualification degree "bachelor"; Organization, logistics, technology and transport management; universities

JEL Codes:

### REFERENCES

Europian Commission. The Bologna Process and the European Higher Education Area. 2018. https://ec.europa.eu/education/policy/higher-education/bologna-process\_en

Beloev H., V. Pencheva, J. Popova. Regional Impact of the University of Ruse, Bulgaria – National and International Dimensions. Proceedings of University of Ruse - 2017, volume 56, book 9. 2017, http://conf.uni-ruse.bg/bg/docs/cp17/9/9-4.pdf

Lyubenov D., T. Balbuzanov, P. Atanasova-Petrova. Improving the Practical Training of Students in the Faculty of Transport, Proceedings of University of Ruse - 2017, volume 56, book 9. 2017, http://conf.uni-ruse.bg/bg/docs/cp17/9/9-16.pdf

Ministerstvo na obrazovanieto I naukata. Zakon za wissheto obrazovanie. 2018. Obn. DV. Br. 112, ot 27 dekemvri 1995, izm. I dop. DV br.56 ot 19 Julay 2022. (Оригинално заглавие: Министерство на образованието и науката. Закон за висшето образование. 2018. Обн. ДВ. бр.112 от 27 Декември 1995г., изм. и изм. и доп. ДВ. бр.56 от 19 Юли 2022г.

Web page of the Univerity of Ruse. Ruse. 2018, https://www.uni-ruse.bg/

Web page of the Erasmus+. 2018, https://ec.europa.eu/programmes/erasmus-plus/node\_en

Web page of department Transport. University of Ruse. 2018 (Оригинално заглавие: страница на катедра Транспорт. Русенски университет. 2018), https://www.uni-ruse.bg/Departments/Transport/staff

Web page of the Univerity Politehnica of Bucharest. 2022, https://upb.ro/en/

Web page of *Transport, Traffic and Logistics* Department from Transport Faculty/ Univerity *Politehnica* of Bucharest. 2022 http://ingtrans.pub.ro/studii-licenta/

Web page of Transport Faculty in University *Politehnica* of Bucharest. 2022 http://transport.upb.ro/

Raicu, S., Popa, Mihaela, Dragu V., Multimodality features of "Transport and Traffic Engineering" curricula at Transport Faculty-University POLITEHNICA of Bucharest, Proceedings of «SCIENTIFIC SYMPOSIUM OF THE TRANSPORT FACULTIES», Ukraine, 2009

Raicu, S., Popa Mihaela, Dragu, V. Contributions of Transportation Research and Consulting Centre from University POLITEHNICA of Bucharest in Transport System Development of Large Urban Areas, International Scientific Symposium "COOPERATION OF TRANSPORT FACULTIES IN FP7 EUROPEAN PROJECTS", 2007, Warsaw, Poland, ISBN 978-83-7204-628-4, pp.103-110, 2007

# ELECTRONIC APPLICATION FOR PROCESSING AND PUBLIC SHARING OF INFORMATION RELATED TO ROAD TRAFFIC ACCIDENTS

#### Ass. Prof. Milena Savova-Mratsenkova, PhD

Department of Combustion Engines, Automobile Engineering and Transport, Technical University of Sofia, Bulgaria Tel.: +359 (2) 965-3499 E-mail: savova@tu-sofia.bg

### Liubomira Aleksova, Student

Department of Combustion Engines, Automobile Engineering and Transport, Technical University of Sofia, Bulgaria Tel.: +359 (2) 965-3499 E-mail: liubomira@abv.bg

Abstract: The vast development of motorization leads to deepening of the problems related to road safety. This imposes higher requirements in the study of traffic accidents and the causes of their occurrence and the application of a systematic approach, based on the analysis of individual elements which affect the process of the occurrence of the accident and its consequences. Providing the possibility to compare the individual elements and study the interaction between them is a necessary condition for the increasing of the road safety. In order for the required information to be reached by the experts who perform the analysis of the realized traffic accidents, it is essential that modern approaches are applied. One of those modern approaches, which are being used nowadays, is through the development of electronic platforms for processing and public sharing of information related to the traffic accidents that have occurred. In the current research development, the need to create an electronic application for processing and public sharing of information, related to traffic accidents, is considered. Automating and digitalizing their registration processes would provide a database, containing various groups of information needed for better research and tracking. The introduction of an electronic version of the necessary documents is an opportunity to control the type and amount of information provided, which would lead to an improvement in the processes of research and analysis of road accidents, regarding the establishment of the causes and mechanism of their occurrence..

Keywords: traffic accident, database, road safety

### REFERENCES

Madjarski, V. (2021). Assessment of the impact of roads and vehicles on the number of persons killed in road traffic accidents in Bulgaria, Proceedings of University of Ruse – 2021, volume 60, ISSN 1311-3321 (print), ISSN 2535-1028 (CD-ROM), ISSN 2603-4123 (on-line).

Madjarski, V. Saliev, D. (2020). *Influence of cartain parameters of the social status of the population on the safety of road traffic,* Proceedings of University of Ruse – 2020, volume 59, ISSN 1311-3321 (print), ISSN 2535-1028 (CD-ROM), ISSN 2603-4123 (on-line).

Siuhi S, Mwakalonge J. (2016). *Opportunities and challenges of smart mobile applications in transportation*. J Traff Transp Eng (English edition). 2016;3(6):582–92.

Ministry of Regional Development and Public Works. (2022). *Territory development law*, The State Gazette was published. No. 1 of January 02, 2001, as amended by the State Gazette No. 94 of Nowember 12 2021 and supplemented by the State Gazette No. 42 of 07 June 2022. (*Оригинално заглавие: Министерство на регионалното развитие и благоустройството, 2022. Закон за устройство на територията, Обн. ДВ. бр.1 от 02 Януари 2001г., изм. ДВ. бр.94 от 12 Ноември 2021 г., доп. ДВ. бр.42 от 07 Юни 2022 г.) Availabel on 12.10.2022 at: https://www.lex.bg/laws/ldoc/2135163904.* 

Ministry of Regional Development and Public Works. (2022). Regulation no. rd-02-20-2 of december 20, 2017 on planning and designing the communication and transportation system of

urbanized territories, The State Gazette was published. No. 7 of January 19, 2018, as amended and supplemented by the State Gazette No. 79 of October 04 2022. (Оригинално заглавие: Министерство на регионалното развитие и благоустройството, 2022. Наредба № рд-02-20-2 от 20 декември 2017 г. за планиране и проектиране на комуникационно-транспортната система на урбанизираните територии, Обн. ДВ. бр.7 от 19 Януари 2018г., изм. и доп. ДВ. 04 бр.79 от Октомври 2022 г.) Availabel on 12.10.2022 at: https://lex.bg/en/laws/ldoc/2137180231.

### FRI-20.25-2-SITSTL-01

# THE LOW SPEED OF MOVEMENT OF THE FREIGHT TRAINS AS A FACTOR FOR DERAILMENT ON HORIZONTAL RAILWAY CURVES

Chief Assist. Prof. Svetoslav Martinov, PhD Department of Railway Engineering, Faculty of Transport, Technical University of Sofia, Bulgaria Phone: (+359) 2 965 2772 E-mail: s.martinov@tu-sofia.bg

**Abstract:** It is often necessary to be reduced speed of movement of the trains in mixed traffic railway sections where the tracks repair is carried out. The trains movement with lower speed than design speed through the horizontal curves in a railway section causes additional load on the inner rail in the curves. The cant excess has been studied in the report. It is appeared when the freight trains are passed on horizontal curves in a railway section where the speed of the trains is temporarily reduced. The norms for determining the cant when horizontal railway curves are designed on railway lines with a gauge of 1435 mm have been studied. a study of rail accidents related to freight wagon derailments in horizontal curves in which the cant excess was a contributing or concomitant factor to the occurrence of the accident, was carried out. Results for the minimum speed of the freight trains movement below that the cant excess in the horizontal curve with relevant radius is observed have been presented in the paper. In this case the overloading of the inner rail of the track is increased and the conditions for derailment are available.

Keywords: Freight train, Horizontal curve, Horizontal alignment, Cant excess, Low speed, Speed limit

#### REFERENCES

Alqatawna, A., Sánchez-Cambronero, S., Gallego, I., & López-Morales, J. M. (2022). a Graphical Method for Designing the Horizontal Alignment and the Cant in High-Speed Railway Lines Aimed at Mixed-Speed Traffic. *Sustainability* 2022, 14, 8377. https://doi.org/10.3390/su14148377.

Fathali, M., MoghadasNejad, F., & MoghadamAli, H. (2019). Horizontal Curve Design of Railway Tracks Incorporating Safety Criteria. *International Journal of Railway Research*, ISSN: 2423-3838, Vol. 6, No. 2, (2019), 63-72.

Lazarevic, L., Popovic, Z., Vilotijevic, M., & Mirkovic, N. (2018). Track alignment parameters on modern railway lines for mixed traffic. *Proceedings of the XVIII Scientific-Expert Conference on Railways in RAILCON '18*, Niš, Serbia, 11–12 October 2018; 77–80.

Powell, A., & Gräbe, P. (2017). Exploring the relationship between vertical and lateral forces, speed and superelevation in railway curves. *Journal of the South African Institution of Civil Engineering*, ISSN 1021-2019, Vol 59, No3, September 2017, Paper 1736, 25–35.

Shkurnikov, S., Bulakaeva, O., & Anisimov, V. Complex Spatial Geometry of Curved Sections on High-Speed Railways. (2022). Bulletin of scientific research results, 2022, iss. 2, (In Russian) DOI: 10.20295/2223-9987-2022-2-164-178, 164–178. (Оригинално заглавие: Шкурников, С., Булакаева, О., Анисимов, В. Сложная пространственная геометрия криволинейных участков трассы высокоскоростных железнодорожных магистралей. Бюллетень результатов научных исследований, 2022, Вып. 2. DOI: 10.20295/2223-9987-2022-2-164-178, 164–178).

Todorov, S. (2014). Train running on horizontal curves – the cant deficiency and excess. Mechanics Transport Communications, vol. 12, 3/3, 2014, ID 1055, ISSN 1312-3823, pp. VIII-9– VIII-15 (**Оригинално заглавие:** Тодоров, С., 2014. Движение на влака в хоризонтални криви – недостиг и излишък на надвишение. Механика Транспорт Комуникации, том. 12, бр. 3/3, 2014, №1055, ISSN 1312-3823, стр. VIII-9–VIII-15).

Valehrach, J., Ríha, T., & Dušek, E. (2017). Cant excess and cant deficiency evaluation in relation to train speed. *Acta Polytechnica CTU Proceedings*, 11:80–85, 2017, doi: 10.14311/APP.2017.11.0080, 80–85.

Design guidelines Railway Alignment. (2021). Rail Baltica. RBDG-MAN-013-0105, pp. 21. Available online: https://www.railbaltica.org/design-guidelines/ (accessed on 16 October 2022).

Ordinance №55/29.01.2004 on Designing and construction of railway lines, railway stations, railway crossings and other elements of the railway infrastructure. (2004). State Gazette 18/05.03.2004, Republic of Bulgaria. (*Оригинално заглавие:* Наредба №55 от 29.01.2004 г. за Проектиране и строителство на железопътни линии, железопътни гари, железопътни прелези и други елементи от железопътната инфраструктура. Държавен вестник на Република България, бр. 18/05.03.2004 г.). Available online:

https://dv.parliament.bg/DVWeb/showMaterialDV.jsp?idMat=21558 (accessed on 16 October 2022, in Bulgarian).

Instruction concerning the structure and maintenance of the superstructure of the railroad and railroad switches. 2022. National Railway Infrastructure Company, Republic of Bulgaria. (*Оригинално заглавие:* Инструкция за устройство и поддържане на горното строене на железния път и железопътните стрелки. 2022. ДП "НКЖИ", България). Available online: https://www.rail-infra.bg/upload/4269/normi\_jelezen\_pat\_strelki\_2022.pdf (accessed on 16 October 2022, in Bulgarian).

## A STUDY OF GROUND HANDLING SAFETY AT SOFIA AIRPORT

### Eng. Petq Tabakova,

Sofia Airport, Phone: (+359) 082 888 605 E-mail: tangrascorp@gmail.com

#### Assoc. Prof. Daniel Lyubenov, PhD

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

**Abstract:** This report presents information about Sofia Airport ground handling. The various types of passenger and cargo transport carried out at the airport are examined. The specialized transport operations that ensure the ground and technical maintenance of the aircraft located on the territory of the airport are described. a description of the means of transport and aircraft maintenance equipment of the three ground operators operating at the airport is presented. Information on aircraft movements for the period 2015 - 2020 is presented. for the same period, a study of the incidents and events that occurred with ground traffic at the airport was conducted. The safety indicator has been determined.

Keywords: Sofia Airport, Ground Handling, Traffic Safety JEL Codes: L91

#### REFERENCES

Alam, S., Lokan, C., Aldis, G., Barry, S., Butcher, R., Abbass, H. (2013). Systemic identification of airspace collision risk tipping points using an evolutionary multi-objective scenario-based methodology. *Transportation Research Part C*: Emerging Technologies, 35, pp. 57-84.

Chang, Y.-H., Wang, Y.-C. (2010). Significant human risk factors in aircraft maintenance technicians. *Safety Science*, 48 (1), pp. 54-62.

Chikha, P., Skorupski J. (2022). The risk of an airport traffic accident in the context of the ground handling personnel performance. *Journal of Air Transport Management*, Volume 105, Article number 102295.

Ek, A., Akselsson, R. (2007). Aviation on the ground: Safety culture in a ground handling company *International Journal of Aviation Psychology*, 17 (1), pp. 59-76.

Nikolova Hr. (2019) Prospects for the development of Sofia Airport as a strategic infrastructure site. (*Оригинално заглавие:* Николова Хр. (2019) Перспективи за развитие на летище София като стратегически инфраструктурен обект.)

Zagorski N., A. Chozhgova, St. Asenov, G. Sotirov (2014). Application of modern methods for aviation safety assessment and risk management in aviation systems. Scientific Conference Space, Ecology, Safety, Sofia. (*Оригинално заглавие:* Загорски Н., А. Чожгова, Св. Асенов, Г. Сотиров (2014). Прилагане на съвременни методи за оценка на авиационната безопасност и управление на риска в авиационните системи. Научна конференция Космос, Екология, Сигурност, София.)

Annual analysis of the state of flight safety in the civil aviation of the Republic of Bulgaria. Годишен анализ на състоянието на безопасността на полетите в гражданската авиация на Република България. - https://www.sofia-airport.bg/

# METHODICAL ASPECTS OF DECREASING TRANSPORT INJURIES IN BULGARIA

#### Kalcho Petkov, PhD student

Department of Transport, "Angel Kanchev" University of Ruse, Republic of Bulgaria E-mail: kpetkov@uni-ruse.bg

Abstract: In the present report, a study of the methods of modern training in traffic safety for children up to 7 years of age was carried out. Children are active participants in traffic. Everyone is responsible for their safety on the street - parents, teachers, drivers of vehicles, institutions, non-governmental structures and organizations. System for organization and management of activities related to education and training on traffic safety in the preschool and school education system, approved by Order No. RD 09-1289/31.08.2016 of the Minister of Education and Science. This report examines the traffic safety curricula for grades 1 to 12, curricula for professional training of students for the profession of "motor vehicle driver", action plans for traffic safety in educational institutions and work plans of school committees on traffic safety. The aim is to define a methodology that will support the education and training of students in a culture of road behavior, which is related to the observance of generally valid rules for safe and tolerant behavior on the road and the norms of personal and collective safety.

Keywords: Car accidents, Injuries, Methodical aspects.

#### REFERENCES

Mojgan Karbakhsh, Emilie Beaulieu, Jennifer Smith, Alex Zheng, Kate Turcotte, Ian Pike, Public attitudes towards the preventability of transport and non-transport related injuries: Can a social marketing campaign make a difference?, Preventive Medicine Reports, Volume 13, 2019, Pages 179-182, ISSN 2211-3355, https://doi.org/10.1016/j.pmedr.2018.12.010.

Agha S. The Impact of a Mass Media Campaign on Personal Risk Perception, Perceived Self-efficacy and on Other Behavioural Predictors. doi:https://doi.org/10.1080/09540120310001618603.

S. Grier, C.A. Bryant, Social marketing in public health, Annu. Rev. Public Health, 26 (1) (2005), pp. 319-339, 10.1146/annurev.publhealth.26.021304.144610

R. Hooper, C.A. Coggan, B. Adams, Injury prevention attitudes and awareness in New Zealand, Inj. Prev., 9 (1) (2003), pp. 42-47, http://www.ncbi.nlm.nih.gov/pubmed/12642558, Accessed 14th Jun 2018

B.P. Hughes, A. Anund, T. Falkmer, a comprehensive conceptual framework for road safety strategies, Accid. Anal. Prev., 90 (2016), pp. 13-28, 10.1016/j.aap.2016.01.017

# TRAFFIC ACCIDENT ANALYSIS IN SPACE AND TIME (IN THE EXAMPLE OF MUNICIPALITY OF RUSE)

#### Stanimir Penev, PhD student

Department of Technical and Natural Sciences, University of Ruse "Angel Kanchev" Tel.: +359889658713 E-mail: spenev@uni-ruse.bg

Abstract: The research analyzes GIS analytic approaches, by determining the locations and times of crashes around Ruse, Bulgaria. to verify that the overall trend of traffic accidents is rising and that the rise is statistically significant, an exploratory space-time pattern analysis is carried out. The Crash data is obtained from local police department and includes the location, date, and time for every motor vehicle traffic accident in Ruse municipality between 2015 and 2020. Each traffic accident is projected on a digital map. a restructuring of the data is developed in order to be examined for space-time trends. The following queries are addressed in this paper: Which roads and crossings in Ruse have the most collisions? When and where do most collisions take place? What distinguishes the spatial distribution of fatalities from the spatial distribution of traffic accidents as a whole? Which roads or crossings consistently have a problem with traffic accidents throughout time? It will be possible to make better informed recommendations for legislation and other measures that can help minimize traffic accidents in the future by understanding where and when incidents happen in the municipality.

Keywords: Efficiency, Effectiveness, GPS, Seismic Protection Methods, Model

#### REFERENCES

Anderson, K. T. (2009). *Kernel density estimation and K-means clustering to profile road accident hotspots*. Accident Analysis & Prevention Volume 41, Issue 3, May 2009, Pages 359-364 https://doi.org/10.1016/j.aap.2008.12.014;

Cheng, Z., Zu, Z., & Lu, J., (2019). *Traffic Crash Evolution Characteristic Analysis and Spatiotemporal Hotspot Identification of Urban Road Intersections*. Sustainability 2019, 11(1), 160; https://doi.org/10.3390/su11010160;

Ekslera, V., Lassarrea, S. and Thomasb, I. (2008). *Regional analysis of road mortality in Europe*. Journal of RIOPH Public Health (2008) 122, 826e837

Fridstrom, L., Ifver J., Ingebritsen S., Kulmala R., Krogsgard Thomsen L., (1995). *Measuring the contribution of randomness, exposure, weather and daylight to the variation in road accident counts.* Accidents Analysis and Prevention, v. 27, nr. 1, 1-20;

Harris, L. N., Goldman, E. (2017). Using spatial statistics to identify emerging hot spots of forest loss. Environ. Res. Lett. 12 (2017) 024012 https://doi.org/10.1088/1748-9326/aa5a2f;

Esri's Network Analyst Community website - https://community.esri.com/t5/arcgis-network-analyst/ct-p/arcgis-network-analyst;

Мъцински, Г.П., Дечкова, В.С. (2018). Концептуален модел на информационна система за автоматизиране на инженерния труд при разследване пътнотранспортни произшествия. ISSN: 1311 2864, volume 33 (2), 2018, Списание: "Известия" на Съюза на учените – Сливен;

Спасова, З., Димитров, Цв., (2014). Универсален термален климатичен индекс и връзката му с пътно-транспортните произшествия. Social Medicine, 2014 – journals.muvarna.bg;

Министерство на вътрешните работи, областна дирекция на мвр-русе, сектор "Пътна Полиция";

Приложение № 1 към т. 1 Списък на републиканските пътища в Република България;

Климатичният контекст на България за съвременната климатология, 1991-2020 г. URL: https://climateknowledgeportal.worldbank.org/country/bulgaria/climate-data-historical;

# MODERN TECHNOLOGIES OF HANDLING PROCESSES IN RIVER PORTS

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

Abstract: The Republic of Bulgaria is located at the crossroads of the Balkans between the roads connecting the countries of the European Union with Turkey and the Middle East, with Ukraine, Russia and Central Asia and between Greece and Scandinavia. The Danube River is the second longest in Europe and is the main inland waterway transport corridor connecting Western and Eastern Europe. Via the rivers Rhine, Main and the Rhine-Main-Danube canal, Corridor No. 7 connects the North Sea with the Black Sea. Ports are specially designed and equipped coastal operating points that are connected to the rail and road network of the respective country and are used for loading, unloading and transshipment of cargo, for navigational services of ships, as well as for passenger services. from a technical and operational point of view, the port is a complex of special facilities and equipment that ensure the safe passage of ships, their normal stay in it and create the necessary opportunities for loading and unloading and other operations. River ports are the backbone of inland waterway transport processes. As a result of the operational activities carried out, ports have become logistics platforms and means of achieving economic prosperity. An important condition for the quality performance of the functions of the river port is that its constituent elements meet certain technical, technological and organizational requirements.

**Keywords:** Port, Special facilities, Special equipment, Loading, Unloading, Technical requirements, Technological requirementsq Organizational requirements.

### REFERENCES

Наредба № 9 от 29.07.2005 г. за изискванията за експлоатационна годност на пристанищата.

Закон за морските пространства, вътрешните водни пътища и пристанищата на Република България.

Техника и технология на товаро-разтоварните процеси – лекции на доц.Т.Узунов

Взаимодействие на видовете транспорт- лекции на проф. В.Пенчева

https://www.mtitc.government.bg/ - Министерство на транспорта, информационните технологии и съобщения

https://www.marad.bg/ - Изпълнителна агенция Морска администрация

http://www.bgports.bg/ - Държавно предприятие Пристанищна инфраструктура.

# STUDY OF OPERATING MODES OF HYDROGEN FUEL CELL G-HFCS-3KW

#### Assoc. Prof. Dimitar Grozev, PhD

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

#### Assoc. Prof. Ivan Beloev, PhD

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

**Abstract:** The paper presents a study of the operating modes of the G-HFCS-3kW hydrogen fuel cell. a working model was built to evaluate the parameters for different operating modes. The results define the consumption of hydrogen when changing the values of the power required for the efficient operation of the hydrogen fuel cell. The conclusions and practical results will be used in assessing the characteristics of an urban concept car powered by a hydrogen fuel cell.

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

### REFERENCES

Khurmi RS (2004) Material Science, S Chand & Company Ltd, New Delhi, ISBN 8121901464 (ISBN13: 9788121901468).

Ali GQ, El-Hiti GA, Tomi I HR, Haddad R, Al-Qaisi, et al. (2016) Photostability and performance of polystyrene films containing 1,2,4-triazole-3-thiol ring system Schiff bases. Molecules 21: 1699. [Crossref]

Yousif E, Hasan A, El-Hiti GA (2016) Spectroscopic, physical and topography of photochemical process of PVC films in the presence of Schiff base metal complexes. Polymers 8: 204.

Akram E, Shaalan N, Rashad AA, Hasan A, Al-Amiery A, et al. (2016) Study of structural and optical properties of New Films Derived PVC-2-[5- phenyl-1,3,4- thiadiazol-2-ylimino-methyl]-benzoic acid. Research Journal of Pharmaceutical, Biological and Chemical Sciences 7: 2836-2844.

Prabhu RR (2013) Stationary Fuel Cells Market size to reach 350,000 Shipments by 2022, Renew India Campaign.

Srivastava HC (2014) Nootan ISC Chemistry, Nageen Prakashan, ISBN 9789382319399. (12th) Edition18: 458-459.

Nigel S, Roberto B, Knut S (2004) Phosphoric acid fuel cells: Fundamentals and applications. Current Opinion in Solid State and Materials Science 8: 372-378.

Zhiwei Y (2004) Novel inorganic/organic hybrid electrolyte membranes Preprints of Papers-American Chemical Society. Division of Fuel Chemistry 49: 599.

Townsend CW, Naselow AB (2008) US Patent 5266421 – Enhanced 59 membraneelectrode interface, assigned to Hughes Aircraft.

Matar S, Hongtan L (2010) Effect of cathode catalyst layer thickness on methanol cross-over in a DMFC. Electrochimica Acta 56: 600-606.

G-HFCS-3KW Fuel Cell System, User manual

Grozev D., I. Beloev, G. Hristov (2019). Creating a urban vehicle prototype with a hydrogen fuel, Scientific Conference RU & SU, Ruse, Copyrights© 2018 ISSN 1311-3321 (print), ISSN 2535-1028 (CD-ROM), ISSN 2603-4123 (on-line)

Grozev D., I. Beloev, G. Hristov (2019). Determining the power required to drive a prototype with hydrogen fuel cell, Scientific Conference RU & SU, Ruse, Copyrights© 2018 ISSN 1311-3321 (print), ISSN 2535-1028 (CD-ROM), ISSN 2603-4123 (on-line)

Белоев И. Проектиране, създаване, провеждане на експерименти и оптимизация на прототип на градски автомобил задвижван от алтернативен енергиен източник. Русе, Академично издателство "Русенски университет", 2018, стр. 80, ISBN 978-954-712-39-5.

Отчет на резултатите от работата по научноизследователски проект, финансиран от фонд "НАУЧНИ ИЗСЛЕДВАНИЯ" 2017 - РУ – 09 на тема "Разработване, изследване и оптимизация на прототип на градски автомобил задвижван от водородна горивна клетка".

# **RESERACH OF DIGITAL SOLUTIONS FOR MANAGING INTERNATIONAL ROAD TRANSPORTATION COMPANY**

#### Radoslav Kolev, PhD student

Department of Transport, "Angel Kanchev" University of Ruse Phone: 082-888 605 E-mail: rkolev@uni-ruse.bg

**Abstract:** The road transport of goods is complicated process and now it becomes more complicated based on the world economic crisis. In order to improve the quality of the service and working process as well as to reduce the transport costs, it appears the need of using digital solutions. In this article we will take a look in two already existing products and we will compare them, one of them is a standard application – DSV Driver application and the other one is new digital solution which includes all functions involved in the transport chain giving the user a totally new opportunity to control the whole transport and process - Nordstar One, which is used in a real time and proved that's working What is the status of the transport market and how by implementing a digital solution, the service can be improved.

Keywords : road transport, quality, transport costs, digital solution

#### REFERENCES

J. -. Andersson, S. Improta and G. Evangellsti, "Digital cross-connect systems - a tool for managing the transport network," International Symposium on Switching, 1990, pp. 195-199, doi: 10.1109/ISS.1990.770130.

Agarwal, R., Gao, G., DesRoches, C., Jha, A. (2010). Research commentary-the digital transformation of healthcare: Current status and the road ahead. Information Systems Research, 21(4), 796–809.

Aumann, R.J. (1959). Acceptable points in general cooperative n-person games. In Tucker, A., & Luce, R. (Eds.) Contributions to the theory of games (Vol. IV, pp. 287–324). Princeton, NJ: Princeton University Press.

Bharadwaj, A., El Sawy, O.A., Pavlou, P.A., Venkatraman, N. (2013). Digital business strategy: Toward a next generation of insights. MIS Quarterly, 37 (2), 471–482.

Budler, M., & Trkman, P. (2017). The role of game theory in the development of business models in supply chains. In Proceedings of the IEEE technology engineering management conference (TEMSCON) (pp. 155–159). Santa Clara, CA.

Carlan, V., Sys, C., Vanelslander, T., Roumboutsos, A. (2017). Digital innovation in the port sector: Barriers and facilitators. In Competition and regulation in network industries (pp. 1–23). https://doi.org/10.1177/1783591717734793.

Choi, H.R., Kim, H.S., Park, B.J., Park, N.K., Lee, S.W. (2003). An ERP approach for container terminal operating systems. Maritime Policy & Management, 30(3), 197–210.

Curiel, I. (1997). Cooperative game theory and applications: cooperative games arising from combinatorial optimization problems. New York: Springer.

Davenport, T.H. (1993). Process innovation: reengineering work through information technology. Boston: Harvard Business School Press.

# RESEARCH INFLUENCE OF AUTONOMOUS EMERGENCY BRAKING OF CAR ON TRAFFIC SAFETY

#### **Teodor Gatev, Phd**

Department of transport "Angel Kanchev" University of Ruse E-mail: tgatev@uni-ruse.bg

Assoc. Prof. Asen Asenov, PhD Department of Transport, University of Ruse Phone: +359 82 888 635 E-mail: asasenov@uni-ruse.bg

Prof. Velizara Pencheva, PhD

Department of Transport, University of Ruse Tel.: +359888293341 E-mail: vpencheva@uni-ruse.bg

**Abstract:** to improve the safety of passenger in the car have been made many- safety belts, airbags, deformation zones etc. This is not the case with pedestrian safety. In Bulgaria pedestrian death are about 25% of all accident death, and this percent in Bulgaria is higher than in Europe where it is about 15-20%. Some of the reason for this are incorrect crossing of the roadway, the dark clothes with which pedestrian move in the dark part of the day and the driver do not notice them, the speed of the vehicle This research evaluates the effectiveness of autonomous emergency braking of traffic safety

Keywords: pedestrian safety, death pedestrian, traffic accident.

### REFERENCES

www.nsi.bg

www.sciencedirect.com

www.avtotachki.com

Halderman, James D. "Automotive technology"

Savaresi, Sergio M. "Active breaking control system design for vehicle"

Dimitrov, Stamen Stanimirov "System for control and management in the vehicle"

Henri Chajmowicz "Prospective assessment of the effectiveness of autonomous emergency braking in car-to-cyclist accidents in France"

# RESEARCHING INNOVATIVE METHODS OF DELIVERY OF PARCELS THROUGH AUTOMATIC POST OFFICES

#### Dimitar Eskidarov, Phd Student

Department of transport "Angel Kanchev" University of Ruse E-mail: tgatev@uni-ruse.bg

## Valeri Gamozov, Phd Student

Department of transport "Angel Kanchev" University of Ruse E-mail: tgatev@uni-ruse.bg

Abstract: with the modern dynamic rates of technological development, accelerated production, increasing competition and expansion of consumer needs, creates conditions for the development of additional logistics supply chains, courier companies increase their efforts to satisfy customer requirements by increasing their system of offices, extending their working hours, working on holidays and weekends and add innovative delivery methods to stay competitive in the market. One of the latest innovations is the construction of a system of automatic post offices that cover the above-mentioned requirements of customers and remove the limits of limited working hours, add flexibility and mobility in the dynamics of hectic life. The autonomous model of automated post offices allows users to choose when to send and receive parcels and reduces the need for traveling suppliers and the construction of additional offices, as well as working in a positive direction from an environmental and economic point of view, reducing harmful greenhouse gas emissions and noise pollution from the additional vehicles.

The report examines all the strengths and potential weaknesses of the system of automatic post offices and the impact on users and the environment in Bulgaria. The results show an increased interest in automatic post offices from busy users due to the ability to manage the time of sending/receiving parcels, as well as reducing car mileage for parcel delivery".

*Keywords:*logistics chain, shipment delivery, courier company, green zones, zero emissions, innovative methods

#### REFERENCES

Lin, J. C., Mitchell, L., Crosman, E., Mendoza, D. L., Buchert, M., Bares, R., Fasoli, B., Bowling, D. R., Pataki, D., Catharine, D., Strong, C., Gurney, K. R., Patarasuk, R., Baasandorj, M., Jacques, A., Hoch, S., Horel, J., &Ehleringer, J. (2018). CO2 and Carbon Emissions from Cities: Linkagesto Air Quality, Socioeconomic Activity, and Stakeholdersinthe Salt Lake City Urban Area, Bulletin of the American Meteorological Society, 99 (11), 2325-2339. Retrieved Apr 12, 2022, from https://journals.ametsoc.org/view/journals/bams/99/11/bams-d-17-0037.1.xml.

Akimoto, H., 2003: Global air quality and pollution. Science, 302, 1716–1719, https://doi.org/10.1126/science.1092666.

Andres, R. J., and Coauthors, 2012: a synthesis of carbondioxide emissions from fossil-fuel combustion. Biogeosciences, 9, 1845–1871, https://doi.org/10.5194/bg-9-1845-2012.

Bares, R., and Coauthors, 2018: Thewinter time covariation of CO2 and criteria pollutantsin an urban valley of the Western United States. J. Geophys. Res. Atmos., 123, 2684–2703, https://doi.org/10.1002/2017JD027917

Интерактивна карта с въведените в европейските градове екологични ограничения за превозни средства - https://urbanaccessregulations.eu/countries-mainmenu-147

Childs, M C, PARKING SPACES: a DESIGN, IMPLEMENTATION, AND USE MANUAL FOR ARCHITECTS, PLANNERS, AND ENGINEERS, 1999, ISBN: 0070121079

Милчев М., Н. Колев, Е. Савев, EXAMIN THE CHANGING CONDITION OF THE FLEET OF VEHICLES, Ecologicavol. 63, pp. 403-406, ISBN:0354-3285

Милчев М., Н. Колев. Относно изменението на техническото състояние на автопарк от лекотоварни автомобили. В: Научни трудове ТОМ 51, серия 4 2012, Русе 2012, ISSN 1311-3321

Милчев М., Н. Колев, И. Дудушки. RESEARCH OF MODEL FOR MAINTAIN VEHICLES. IN: Международна, младежка турско-българска, международна, научна конференция - "Технологии и иновационни решения 2011", Тракийски университет гр.Одрин, Турция, 2011 ISBN 978-954-337-163-1

Грозев Д., И. Белоев, Г. Христов, А. Асенов, Д. Топчу, М. Милчев. Оптимизиране на транспортните разходи за доставка на малки пратки в условията на средно голям град. В: Научни трудове на Русенския университет "Ангел Кънчев", том 54, Русе, 2015, ISBN 1311-3321.

https://www.hibike.bg/urban-arrow-family-performance-plus-e-kolelo-tovaren-velosiped-b-lo-model-2022-p7484add2b84aed93eda85c7d856803ab#var\_18590006

## FRI-2K.201-1-HP

#### FRI-2K.201-1-HP-01

# MENOPAUSE: PHYSICAL THERAPY IN HELP TO EASE "THE CHANGE"

#### Assoc. Prof. Irina Karaganova, PhD

Department of Public Health University of Ruse, Bulgaria E-mail: ikaraganova@uni-ruse.bg

#### Assoc. Prof. Stefka Mindova, PhD

Department of Public Health University of Ruse, Bulgaria E-mail: smindova@uni-ruse.bg

Abstract: Menopause is not a Disease. It's a natural stage in a woman's life. Menopause occurs when estrogen and progesterone decrease and a woman's ovarian function stops. for many women this period can be a difficult physiological and psychological transition. The symptoms experienced include vasomotor (hot flushes and night sweats), psychological (depression, insomnia), somatic (palpitations, backache and, dizziness), and sexual (reduced libido and, vaginal dryness). Menopausal symptoms are associated with deterioration in physical, mental, and sexual health, lowering women's quality of life.

Of relevance to menopausal women, are the benefits of regular physical activity for reducing the risk of cardiovascular disease, osteoporosis, obesity, and depression. There are studies in the literature that deal with the effect of exercise on menopausal symptoms. Regular sports and exercise can help women over 50 to limit some of the symptoms accompanying menopause. Evidence shows that addressing pelvic floor muscle function, in conjunction with improving overall muscle strength and physical wellbeing, can help to reduce and even prevent many symptoms related to menopause. The impact of muscle activity is so profound and multifaceted that it favorably affects all body functions and structures, including protein biosynthesis.

In this regard, our study objective is examining the effect of physical exercise in women with menopausal symptoms.

Keywords: Menopause, Estrogen, Physical activity, Physical therapy, Quality of life.

#### REFERENCES

Bullen Love, D., (2019). Menopause: PTs Help to Ease 'The Change'. Sept 2019. PT In Motion. 18-25.

Кагадапоva, I. (2008). Kinesitherapy in more common geriatric diseases. Pleven, *Mediatech-Pleven*, 2016, pp. 1119-126, ISBN 978-619-207-064-9. (*Оригинално заглавие на български език:* Караганова, И. (2008). Кинезитерапия при по-чести гериатрични заболявания. Плевен, *Meduamex-Плевен*, 2016, стр. 1119-126, ISBN 978-619-207-064-9).

Lindh-Åstrand, L., et al., (2004). Vasomotor symptoms and quality of life in previously sedentary postmenopausal women randomised to physical activity or estrogen therapy. *Maturitas* 48.2, 2004, pp 97 - 105.

Llanas, A. c., et al., (2008). Physical therapy reduces insomnia symptoms in postmenopausal women. *Maturitas* 61.3, 2008, pp 281 – 284.

Medina, Lauren D., Shannon Sabo, and Jonathan Vespa, (2020). "Living Longer: Historical and Projected Life Expectancy in the United States, 1960 to 2060," P25-1145, *Current Population Reports*, P25-1145, U.S. Census Bureau, Washington, DC, 2020.

The Menopause Years, (2018). American College of Obstetricians and Gynecologists, 2018, www.acog.org/en/Patient%20Resources/FAQs/Womens%20Health/The%20Menopause%20Years

## FRI-2K.201-1-HP-02

# KINESITHERAPY FOR WEAKNESS PELVIC FLOOR MUSCLE IN WOMEN

Assoc. Prof. Ivelina Stefanova, PhD Department of Public Health, University of Ruse "Angel Kanchev" E-mail: istefanova@uni-ruse.bg

**Abstract:** The article examines the role of the pelvic floor muscles in women, risk factors for damage and weakness, symptoms and some specific techniques of kinesitherapy - pelvic floor exercises. These muscles can be damaged by childbirth, surgery, hormonal changes during menopause, or lose strength as a natural part of aging. The important role of kinesitherapy in improving the condition of women with such problems is identified, and a brief guide to rehabilitation is offered. Regular exercise both maintains and improves women's health at different stages of life.

Keywords: Kinesitherapy, Pelvic floor, Weakness, Pelvic floor muscle exercise benefit

#### REFERENCES

Baltadjiev, G., P. Atanasova, I. Koeva, S. Sivkov, A. Baltadjiev (2019). Human anatomy, Laks buk press (*Оригинално заглавие:* Балтаджиев, Г., П. Атанасова, И. Коева, С. Сивков, А. Балтаджиев 2019. Анатомия на човека. Издателство Лакс бук)

Dumoulin C , Hay-Smith J , Habee-Seguin GM , Mercier J ., (2015). Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women: a short version Cochrane systematic review with meta-analysis . Neurourol Urodyn.

Cho ST, Kim KH (2021). Pelvic floor muscle exercise and training for coping with urinary incontinence. J Exerc Rehabil.

Epifanov, W. A. (2007). Therapeutic exercise and sports medicine. Textbook. (*Оригинално* заглавие: Епифанов В.А. 2007. Лечебная физкультура и спортивная медицина: учебник для вузов)

Karaganova, I., (2016). Kinesitherapy in more common geriatric diseases, Mediateh press, Pleven (*Оригинално заглавие*: *Караганова, И., 2016. Кинезитерания при по-чести гериатрични заболявания, изд. Медиатех-Плевен*)

Li C, Gong Y, Wang B., (2016). The efficacy of pelvic floor muscle training for pelvic organ prolapse: a systematic review and meta-analysis . Int Urogynecol J.

Ouchi M, Kato K, Gotoh M, Suzuki S. (2017). Physical activity and pelvic floor muscle training in patients with pelvic organ prolapse: a pilot study. Int Urogynecol J.

Patricia J. Ohtake, Diane Borello-France (2017). Rehabilitation for Women and Men with Pelvic-Floor Dysfunction. Physical Therapy, Volume 97

Pollard, C., C. Carus (2019). Does pelvic floor muscle training improve symptoms of pelvic organ prolapse for women? a review of the evidence and reflection on the physiotherapist's role. Journal of Pelvic, Obstetric and Gynaecological Physiotherapy, Spring 2019, 124, 22–32

Platzer, W. (2005). a color atlas of anatomy in 3 volumes. Musculoskeletal system. Letera press. (**Оригинално заглавие:** Платцер, В. 2005. Цветен атлас по анатомия в 3 тома. Двигателен апарат, изд. Летера)

Ророva-Dobreva, D. (2011). Pelvic floor kinesitherapy. Tip-top press. (*Оригинално* заглавие: Попова-Добрева, Д., 2011. Тазово-дънна кинезитерания, Тип-топ прес)

Ророv, N. (2012). Introduction to physical therapy. NSA-PRESS, (*Оригинално заглавие:* Попов, Н., 2012. Въведение във физиотеранията, НСА ПРЕС).

### FRI-2K.201-1-HP-03

## DISTAL FEMORAL FRACTURES – OUR TREATMENT PROTOCOL

#### Assoc. Prof. Yordan Andonov, PhD Department of Public Health

University of Ruse, Bulgaria E-mail: jandonov@uni-ruse.bg

## Angelov Nikolay MD

Department of Ortopedics and traumatology UMBAL Kaneff AD

**Abstract:** The paper reviews a treatment protocol for the distal femoral fractures. The indications, advantages and limitations of the double plating technique are discussed and evaluated in a series of 10 complex distal femoral fractures treated for a period of 5 years. The average age of the patients is 57 years, there are 3 males and 7 females. They are followed up for a period ranging from 8 to 24 months. All fractures have united for an average period of 18 weeks. Two of the patients had excellent, 5 had good, 2 had average and one had bad functional result. There are no major complications. Two patients had delayed fracture healing for periods longer than 6 months. Three knees had an extension deficit at the final examination. Double plating is recommended in case of medial bone loss, low bone quality, fracture comminution, obesity, diabetes, open fracture, treatment of non-unions.

Keywords: distal femoral fracture, double plating, treatment protocol, functional results

### REFERENCES

Beltran MJ, Gary JL, Collinge CA. Management of distal femur fractures with modern plates and nails: state of the art. J Orthop Trauma. 2015 Apr;29(4):165-72. doi: 10.1097/BOT.00000000000302. PMID: 25793566.

Briffa N, Karthickeyan R, Jacob J, Khaleel A. Comminuted supracondylar femoral fractures: a biomechanical analysis comparing the stability of medial versus lateral plating in axial loading. Strategies Trauma Limb Reconstr. 2016 Nov;11(3):187-191. doi: 10.1007/s11751-016-0268-0. Epub 2016 Oct 12. PMID: 27734338; PMCID: PMC5069206.

El Beaino M, Morris RP, Lindsey RW, Gugala Z. Biomechanical Evaluation of Dual Plate Configurations for Femoral Shaft Fracture Fixation. Biomed Res Int. 2019 Apr 28;2019:5958631. doi: 10.1155/2019/5958631. PMID: 31183369; PMCID: PMC6512036.

Imam MA, Torieh A, Matthana A. Double plating of intra-articular multifragmentary C3-type distal femoral fractures through the anterior approach. Eur J Orthop Surg Traumatol. 2018 Jan;28(1):121-130. doi: 10.1007/s00590-017-2014-9. Epub 2017 Jul 14. PMID: 28710534.

Jiamton C, Apivatthakakul T. The safety and feasibility of minimally invasive plate osteosynthesis (MIPO) on the medial side of the femur: a cadaveric injection study. Injury. 2015 Nov;46(11):2170-6. doi: 10.1016/j.injury.2015.08.032. Epub 2015 Aug 31. PMID: 26343301.

Metwaly RG, Zakaria ZM. Single-Incision Double-Plating Approach in the Management of Isolated, Closed Osteoporotic Distal Femoral Fractures. Geriatr Orthop Surg Rehabil. 2018 Nov 11;9:2151459318799856. doi: 10.1177/2151459318799856. PMID: 30542626; PMCID: PMC6236632.

Ricci WM, Streubel PN, Morshed S, Collinge CA, Nork SE, Gardner MJ. Risk factors for failure of locked plate fixation of distal femur fractures: an analysis of 335 cases. J Orthop Trauma. 2014 Feb;28(2):83-9. doi: 10.1097/BOT.0b013e31829e6dd0. PMID: 23760176.

Rodriguez EK, Zurakowski D, Herder L, Hall A, Walley KC, Weaver MJ, Appleton PT, Vrahas M. Mechanical Construct Characteristics Predisposing to Non-union After Locked Lateral Plating of Distal Femur Fractures. J Orthop Trauma. 2016 Aug;30(8):403-8. doi: 10.1097/BOT.00000000000593. PMID: 27027801.

Rollick NC, Gadinsky NE, Klinger CE, Kubik JF, Dyke JP, Helfet DL, Wellman DS. The effects of dual plating on the vascularity of the distal femur. Bone Joint J. 2020 Apr;102-B(4):530-538. doi: 10.1302/0301-620X.102B4.BJJ-2019-1776. PMID: 32228080.

Sain A, Sharma V, Farooque K, V M, Pattabiraman K. Dual Plating of the Distal Femur: Indications and Surgical Techniques. Cureus. 2019 Dec 27;11(12):e6483. doi: 10.7759/cureus.6483. PMID: 31903313; PMCID: PMC6935741.

Sirisreetreerux N, Shafiq B, Osgood GM, Hasenboehler EA. Medial Knee Approach: An Anatomical Study of Minimally Invasive Plate Osteosynthesis in Medial Femoral Condylar Fracture. J Orthop Trauma. 2016 Nov;30(11):e357-e361. doi: 10.1097/BOT.00000000000659. PMID: 27768679.

Tripathy SK, Mishra NP, Varghese P, Panigrahi S, Purudappa PP, Goel A, Sen RK. Dual-Plating in Distal Femur Fracture: a Systematic Review and Limited Meta-analysis. Indian J Orthop. 2021 Aug 23;56(2):183-207. doi: 10.1007/s43465-021-00489-0. PMID: 35140850; PMCID: PMC8789962.
# HEMISOLEUS MUSCLE FLAP FOR TREATMENT OF A GRADE III OPEN TIBIAL FRACTURE

#### Assoc. Prof. Yordan Andonov, PhD

Department of Public Health University of Ruse, Bulgaria E-mail: jandonov@uni-ruse.bg

#### Ahmed Ahmedov, MD

Department of surgery UMBAL Kaneff AD Tel.:+359897021727 E-mail: dr.ahmedahmedov@gmail.com

#### **Boian Valentinov, MD, PhD**

Department of Ortopedics and traumatology UMBAL Kaneff AD

**Abstract:** The paper reviews the implication of a hemisoleus muscle flap for the treatment of a grade 3 open tibial fracture. The indications, advantages and limitations of the flap are discussed and evaluated in a case report. The age of the patient is 57 years. He is followed up for a period of 10 months. The fracture united for a period of 6 months. There was no deep infection. There was a partial flap necrosis, that was debrided and covered with split thickness skin graft. The knee join regained full ROM, the ankle joint was stiff with an equines contracture of 10 degrees. Hemisoleus flap is recommended in case of a middle or distal skill loss. It offers biological coverage of the open fracture as well as uninterrupted blood supply. Sacrificing part of the soles muscle weakens the calf and may lead to contractures with improper rehabilitation.

Keywords: grade 3 open tibial fracture, hemisoleus flap, functional results

#### REFERENCES

Ahmad I, Akhtar S, Rashidi E, Khurram MF. Hemisoleus muscle flap in the reconstruction of exposed bones in the lower limb. J Wound Care. 2013 Nov;22(11):635, 638-40, 642. doi: 10.12968/jowc.2013.22.11.635. PMID: 24225604.

Delgado Perez JA, Rodriguez P, Liette MD, Masadeh S. Medial Hemisoleus Flap for Middle Third of the Tibia Defects. Clin Podiatr Med Surg. 2020 Oct;37(4):621-630. doi: 10.1016/j.cpm.2020.05.001. Epub 2020 Aug 12. PMID: 32919594.

Kim PH, Leopold SS. In brief: Gustilo-Anderson classification. [corrected]. Clin Orthop Relat Res. 2012 Nov;470(11):3270-4. doi: 10.1007/s11999-012-2376-6. Epub 2012 May 9. Erratum in: Clin Orthop Relat Res. 2012 Dec;470(12):3624. Erratum in: Clin Orthop Relat Res. 2019 Oct;477(10):2388. PMID: 22569719; PMCID: PMC3462875.

Kohlprath R, Assal M, Uçkay I, Holzer N, Hoffmeyer P, Suva D. Fractures ouvertes de la diaphyse tibiale chez l'adulte: prise en charge chirurgicale et complications [Open fractures of the tibia in the adult: surgical treatment and complications]. Rev Med Suisse. 2011 Dec 21;7(322):2482, 2484-8. French. PMID: 22288287.

Mathes SJ, Nahai F. Classification of the vascular anatomy of muscles: experimental and clinical correlation. Plast Reconstr Surg. 1981 Feb;67(2):177-87. PMID: 7465666.

Pu LL. Soft-tissue coverage of an extensive mid-tibial wound with the combined medial gastrocnemius and medial hemisoleus muscle flaps: the role of local muscle flaps revisited. J Plast Reconstr Aesthet Surg. 2010 Aug;63(8):e605-10. doi: 10.1016/j.bjps.2010.05.003. PMID: 20627760.

Pu LLQ. Further experience with the medial hemisoleus muscle flap for soft-tissue coverage of a tibial wound in the distal third of the leg. Plast Reconstr Surg. 2008 Jun;121(6):2024-2028. doi: 10.1097/PRS.0b013e318171240c. PMID: 18520891.

Raveendran SS, Kumaragama KG. Arterial supply of the soleus muscle: anatomical study of fifty lower limbs. Clin Anat. 2003 May;16(3):248-52. doi: 10.1002/ca.10098. PMID: 12673820.

Schierle CF, Rawlani V, Galiano RD, Kim JYS, Dumanian GA. Improving outcomes of the distally based hemisoleus flap: principles of angiosomes in flap design. Plast Reconstr Surg. 2009 Jun;123(6):1748-1754. doi: 10.1097/PRS.0b013e3181a65a74. PMID: 19483574.

Tobin GR. Hemisoleus and reversed hemisoleus flaps. Plast Reconstr Surg. 1985 Jul;76(1):87-96. doi: 10.1097/00006534-198507000-00015. PMID: 4011783.

Wong TM, Lau TW, Li X, Fang C, Yeung K, Leung F. Masquelet technique for treatment of posttraumatic bone defects. ScientificWorldJournal. 2014 Feb 6;2014:710302. doi: 10.1155/2014/710302. PMID: 24688420; PMCID: PMC3933034.

Zenn M, Jones G. Reconstructive surgery: anatomy, technique, and clinical application. New York: CRC Press; 2012. p. 1628–53.

# SOCIAL ASPECTS OF STRESS URINARY INCONTINENCE

#### **Assist. Prof. Denitsa Vasileva, PhD** Department of Public Health University of Ruse, Bulgaria Phone: 0878 25 39 07

E-mail: ddecheva@uni-ruse.bg

**Abstract:** The article examines the problem of stress urinary incontinence in its social aspect and its impact on the quality of life. Data are based on a closed-ended, short-answer questionnaire of 50 women in Ruse with stress urinary incontinence. The received answers provide information about the manifestation of the nosology and its impact on the social and cultural life of women. On this basis, it is necessary to develop health and kinesitherapeutic programs for the treatment and prevention of stress urinary incontinence in order to maintain a high quality of life and cultural and social status.

Keywords: Stress urinary incontinence, qiestionnaire, social and culture difficulties

# REFERENCES

Deleva, R., Dacheva, V. (2017). URINARY INCONTINENCE - DEVELOPMENT AND KINESYTHERAPY. Proceedings of the Union of Scientists – Ruse, Medicine and Ecology, 4(7), 84 - 92. (*Оригинално заглавие:* Делева, Р., Дачева, В. (2017). Уринарната инконтиненция – разпространение и кинезитералия. Известия на съюза на учените – Русе, Медицина и екология, 4(7), 84 - 92.).

Karaganova, I. (2016). *Kinesitherapy in more common geriatric diseases*, Mediatech – Pleven, (112-114) ISBN: 978-619-207-064-9 (*Оригинално заглавие: Караганова, И. (2016). Кинезитерапия при по-чести гериатрични заболявания, Медиатех - Плевен, (112-114), ISBN: 978-619-207-064-9*).

Kang, Y., Crogan, N. (2008). Social and Cultural Construction of Urinary Incontinence among Korean American Elderly Women, *Geriatric Nursing*, 29 (2), 105-111.

Kwak, Y., Kwon, H., Kim, Y. (2015). Health-related quality of life and mental health in older women with urinary incontinence. *Aging and Mental Health*, 20 (7), 719-726.

Serbezova, I. (2021). CONTEMPORARY MIDWIFE CARE FOR WOMEN'S PELVIC FLOOR HEALTH. *PROCEEDINGS OF UNIVERSITY OF RUSE*, 60 (8.2), 23 – 32. ISSN: 2603-4123.

Viktrup, L., Koke, S., Burgio, K., Ouslander, J. (2005). Stress urinary incontinence in active elderly women. *Southern Medical Journal*, 98(1), 79.

# SCOLIOSIS REDUCTION WITH B.A.E. METHOD ON A 21 YEARS OLD FEMALE WITH CHECK UP AFTER A YEAR AND A HALF

#### **Tiziano Pacini**

ul. D. Vatax, 30 -1510 Sofia, Bulgaria Cell. +359878474304, +393355262723, E-mail: tizianopacini@gmail.com

**Loredana Granata** via G.Verdi, 26, - 50066 San Clemente, Reggello Italia Cell.+393881460207, E-mail: loredanagranata28@gmail.com

Elisabetta De Juliis via Mulinaccio, 11 - 50032 Borgo San Lorenzo, Italia Cell. +393356477583 E-mail: elisadejuliis@gmail.com\

Abstract: Ideopathic scoliosis in a 21 years old female who works as a hairdresser. The girl reports frequent pains in the cervical and lumbar tracts together with pain at her knees. She has been treated with the biomechanic anthropometric ergonomic method (B.A.E.) with positive results. Method: the girl was previously treated only with the physiotherapic protocols with insufficient result for two years. During the medical and physiotherspical management the pain improved only for short periods under treatment, she has been treated with the B.A.E. method for 18 months with positive outcomes both in the mobility and in the pain.

Keywords: Posture, Biomechanic Anthropometric Ergonomic Method, scoliosis, back pain, pain in the lower limbs.

#### REFERENCES

Pacini T., Biomechanical Anthropometric Ergonomic Method for Assessment and Correction of the Human Posture, PhD Thesis, University of Ruse "Angel Kanchev", 2015

Massara G., Pacini T., Vella G. Ergonomia del sistema posturale, Fabrica del 3° millennio, Marrapese Ed. S.R.L. Roma, 2008

Пачини Т., Биомеханичен, антропометричен и ергономичен метод за контрол на стойката на човешкото тяло. Наука и спорт, 4, 2012

Пачини Т., Деюлис Е., Коли Е. Взаимодействие между лумбална лордоза и m.iliopsoas. Наука и спорт, 6, 2013

Planas P., Rehabilitacio Neuro – Occlusal (2ed.), Amolca 2008.

Rocabado M., Annette Z.I. Musculoskeletal Approach to Maxillofacial Pain, Lillincott Williams and Wilkins, 1991.

Pacini T., Neck posture, cervical spine problems, temporomandibular joints and the Anthropometric Ergonomic Biomechanical (A.E.B.) Method, University of Ruse "Angel Kanchev", 2013

Tiziano Pacini, Ferdinando Pivetta, Elisabetta de Juliis, Neck's posture: woman 54 years old suffering from Dizziness, Labyrinthitis, Headache, Neck Pain, Shoulder Pain, Carpal Tunnel Syndrome, treated with Biomechanical Anthropometric, University of Ruse "Angel Kanchev", 2013

Tiziano Pacini, Elisabetta de Juliis, Andrea Pacini: Thermography and Posture: The thermography allows to see the change of muscular muscles of the various body parts in real time. a person shows at the thermography investigation a muscular surface that is detectable as an image

proportional to the quantity of heat emitted by the muscles and by their work. Its usage can be studied in association with the B.A.E. method, University of Ruse "Angel Kanchev", 2019

Tiziano Pacini, Elisabetta de Juliis, Ferdinando Pivetta, Implications of the Posture and of the gravitational field management in the Fibromyalgia and in its symptoms of pain and panic: progress test in the treatment of a 48 fibromyalgic man with the Biomechanic Anthropometric Ergonomic Method B.A.E. for 18 months, University of Ruse "Angel Kanchev", 2019

# OCCUPATIONAL THERAPY ASSESSMENT AND INTERVENTION TO IMPROVE PLAY PARTICIPATION OF CHILDREN WITH DISABILITIES

Assoc. prof. Petya Mincheva, PhD OT Department of Public health University of Ruse "Angel Kanchev" Phone: +359886439086 E-mail: pmincheva@uni-ruse.bg

**Abstract:** Play has essential role in occupational therapy working in pediatric area. In order to improve participation in play of children with disabilities, the first step is comprehensive and specific assessment. Once the problems are determined reasonably, occupational therapy approaches are planned and performed individually or in group settings with the children. Important member in the process are parents, siblings, friends and peers. Occupational therapists work also very much on the influence of the environment where play takes places. The paper presents the most used methods and tools for play assessments and intervention.

Keywords: Play, Occupational therapy, Assessment

#### REFERENCES

Besio S., Bulgarelli D.§ Stancheva-Popkostadinova V. (2018), *Evaluation of childrens' play*. Sciendo, De Gruyter, ISBN: 978-3-11-061057-4

Case-Smith, J.& O'Brien J. (2010). *Occupational Therapy for Children*. 6th ed. Maryland Heights Mo: Mosby/Elsevier, ISBN: 9780323056588

Moore, A. |& Lynch, H. (2018), Play and play occupation: a survey of paediatric occupational therapy practice in Ireland, *Irish Journal of Occupational Therapy*, Vol. 46 No. 1, 59-72

Parham L. D. & L. Fazio. (2008). *Play in Occupational Therapy for Children*. 2nd ed. St. Louis Mo: Mosby Elsevier, ISBN: 9780323029544

Veleva A. (2013), Pedagogics of play, MEDIATEH- Pleven (*Оригинално заглавие: Велева, А. (2013). Педагогика на играта – Плевен: МЕДИАТЕХ*)

# PHYSIOTHERAPEUTIC GUIDELINES FOR THE TREATMENT OF URINARY INCONTINENCE IN WOMEN

Assist. Prof. Yuliana Pashkunova, PhD Department of Public Health University of Ruse, Bulgaria Phone: 0889/255301 E-mail: ypashkunova@uni-ruse.bg

**Abstract:** In recent years, there has been an extraordinary increase in the frequency and severity of urinary disorders and dysfunctions with a pronounced functional deficit and resulting reduction in the quality of life for these patients. It is necessary to get out of the classical boundaries of orthodox medicine and direct attention to the natural and reshaped physical factors of impact on the human organism, combined with kinesiotherapy. Urinary incontinence can affect anyone at any age.

Keywords: urinary disorders, natural and reshaped physical factors, kinesiotherapy.

#### REFERENCES

Abrams, P., Cardozo, L. & Fall, M. (2002). *The standardisation of terminology of lower urinary tract function:* report from the Standardisation Sub-committee of the International Continence Society. Neurourol Urodyn, 21:167.

Berghmans B. (2006). *The role of the pelvic physical therapist*, Actas Urologicas Espanolas, 110-112.

Botsova, V. (2006). Overactive bladder - clinical aspects, diagnosis and treatment. Practical Pediatrics Journal, Sofia, issue 6, 6-9.

Hubchev, G. (2020). Application of the Reemex system (artificial sphincter) in severe forms of stress urinary incontinence in women. Modern Medical Science Journal, Sofia, issue 1, 19-23.

Ivanova, J., Kornovski, J., Kostov, S. Slavchev, S. & Yordanov, A. (2021). *Operative treatment of women with urinary incontinence by non-ablative Erbium-Yag (Fototna) laser.* Journal, Sofia, issue 4, 15-19.

Kazalkova, K. (2008). *Kinesitherapy - a powerful tool in the treatment of stress urinary incontinence in women*. Kinesitherapy and Rehabilitation Journal 1-2, 17-19.

Kazalkova, K. & Troev, T. (2011). European standardization and modern concepts for the treatment of urinary incontinence, types, frequency, sex. Physical medicine, Rehabilitation, Health Journal, Sofia, issue 4, 10-14.

Kazalkova, K. & Troev, T. (2011). *European and global programs for the physical treatment of urinary incontinence*. Physical medicine, Rehabilitation, Health Journal, Sofia, issue 4, 15-19.

# THE ROLE OF CUPPING THERAPY IN SHOULDER PATHOLOGIES

#### Yoan Petrov - student

Department of Kinesitherapy, Faculty of Public Health, Medical University of Varna "Prof. Dr. Paraskev Stoyanov", Varna Tel.: +359895513413 E-mail: yoanpetrov789@gmail.com

#### Ana Ivanova – student

Department of Kinesitherapy, Faculty of Public Health, Medical University of Varna "Prof. Dr. Paraskev Stoyanov", Varna Tel.: +359893979969 E-mail: aniterian@abv.bg

#### Tsveta Bulatova - student

Department of Kinesitherapy, Faculty of Public Health, Medical University of Varna "Prof. Dr. Paraskev Stoyanov", Varna Tel.: +359898211342 E-mail: tsvetibukhan@gmail.com

## Assis. Prof. Valentin Velchev

Department of Kinesitherapy, Faculty of Public Health, Medical University of Varna "Prof. Dr. Paraskev Stoyanov", Varna Tel.: +359896399611 E-mail: vvelchev1984@abv.bg

**Abstract:** The glenohumeral joint is part of the shoulder complex, which includes the clavicle, shoulder blade, shoulder bone, sternum and ribs, as well as the articular ligaments that connect and strengthen them. The large range of motion in the joint and its low congruence compromises its stability, which is a prerequisite for easy vulnerability. Pathological changes in the shoulder joint include: instability, dislocations, fractures, arthropathies and others. We'll discuss cupping as an alternative method that finds its application in complex treatment. The healing effect of the cupping therapy is due to the hyperemia and the irritation of the skin receptors. In this way, blood circulation is improved, muscle spasm is reduced, swelling and inflammation of the nerve roots are removed, skin breathing is improved, trophicity is improved, lymphatic drainage is improved.

Keywords: Shoulder, Cupping therapy, Kinesiotherapy

# REFERENCES

Chirali Z. (2014). Traditional Chinese Medicine Cupping Therapy. Churchill Livingstone. Fisher P.A. Ward. (1994). Medicine in Europe. Complementary medicine in Europe, BMJ, 309:107-111.

Dimitrov N. Staykova Y, Pirovski N. (2020). Guide to Traditional Chinese medicine and other holistic methods. Ed. "Contrast". Stara Zagora.

Ivanova E.K. (2022). Non-Conventional Methods for Beneficial Impact on Human Health and Training of Healthcare Professionals [dissertation]. Medical University of Varna;. [In Bulgarian]

Kapincheva I, Vankova D. (2018). The European concept of "complementary and alternative medicine" - history, essence and place in society healthcare. Social Medicine, (2):18-22.

Levit K. (1979). The needle effect in the relief of myofascial pain. Pain. 6 (1): 83-90

Nikolova D, Ivanova E, Mancheva P. (2017). Eastern healing systems - therapeutic aspects and their application to form a healthy way of life. Varna Medical Forum, 6(2):242-244.

Stoianov, S. Petrov, V. Paskaleva, R. (2018). The treatment massage - the ancient religion of the people. Science & Technologies, 8(1): 123-130.

Subev, Y. Atanasova, A. Nedev, N. (2015). Cupping therapy as an alternative method in the complex rehabilitation of a patient with cervical osteochondrosis (presentation of a case). Varna Medical Forum, 4(3), 146-149.

Tarpomanova Ts. (2018). Awareness, attitude and readiness of Bulgarians for using the methods of eastern medicine, Social Medicine, (4):51-54.

Vankova, D., (2018). SWOT Analysis of Eastern Medicine Developments in Bulgaria, Scripta Scientifica Salutis Publicae, 4, 34-41.

Yaneva-Balabanska I. (2007). Aspects of unconventional medicine. Social Medicine, (1):14-18.

# THE ROLE OF THE PHYSICALTHERAPY AFTER TRAUMATIC DISLOCATION OF THE SHOULDER BY ATHLETES

#### Viktor Stoyanov – student

Department of Kinesitherapy, Faculty of Public Health Medical University of Varna ''Prof. Dr. Paraskev Stoyanov'', Varna Tel: +359897313696 E-mail: stoqnoviktor77@gmail.com

#### Tsvetomira Ivanova – student

Department of Kinesitherapy, Faculty of Public Health Medical University of Varna ''Prof. Dr. Paraskev Stoyanov'', Varna Tel: +359896464347 E-mail: fleckled.ivanova@gmail.com

## Altsek Naydenov – student

Department of Kinesitherapy, Faculty of Public Health Medical University of Varna ''Prof. Dr. Paraskev Stoyanov'', Varna Tel: +359884007571 E-mail: alcek202bg@gmail.com

## Assist.Prof. Vladimir Krastev

Department of Kinesitherapy, Faculty of Public Health Medical University of Varna ''Prof. Dr. Paraskev Stoyanov'', Varna Tel: +359877280840 E-mail: vladimirkrystev96@abv.bg

**Abstract:** The shoulder joint is the most mobile joint in the musculoskeletal system. It is the most frequently luxated joint (about 45% of all joint luxations). Its stability is mostly achieved by soft tissue dynamic and static stabilizers (rotator cuff, joint capsule, glenohumeral ligaments). Limited skeletal stability and predominantly dynamic stabilization make it susceptible to luxation. Sports who are associated with heavy loads on the joints and connective tissue and are often accompanied by chronic problems. Dislocation is a condition that is more commonly seen in more contact sports such as football, rugby, wrestling, basketball, volleyball, etc. While not the most serious type of injury, dislocations can put athletes at long-term risk of more and more frequent shoulder injuries if not treated properly. The purpose of the present study is to examine the possibilities of the physiotherapy in the recovery process for athletes who have suffered this type of trauma, as well as the reduction of the risk of subsequent injuries.

Keywords: dislocation, shoulder, physiotherapy, sport

# REFERENCES

Velchev, V. Bogomilova, S. (2020) The Place of Kinesitherapy for degenerative changes in shoulder joint. PROCEEDINGS OF UNIVERSITY OF RUSE, 59(8.5), 37-42.

Twomey, J. Kozak, BS. Keith, G. Whitlock, MD. Jeff, A. O'Donnell, MD. Anakwenze, A. Christopher, A. Klifto, A. MD (2021) Department of Orthopaedic Surgery, Duke University Medical Center, Durham, NC, USA

Taskoparan, H. Kilincoglu, V. Tunay, S. Bilgic, S. Yurttas, Y. Komurcu, M. (2010) Immobilization of the shoulder in external rotation for prevention of recurrence in acute anterior dislocation. Acta Orthop Traumatol Turc. (44:278-84).

Sherman, SC. (2020) MD Sep 17

Seybold, D. Gekle, C. Fehmer, T. et al: (2006) Immobilization in external rotation after primary shoulder dislocation. Chirurg 77(9):821-826, 2006.

Rahman, S., Wienanda, G. K. ., & Akbar, F. (2022). Recurrent shoulder dislocation treated with Bristow Latarjet procedure: a case report. Indonesia Journal of Biomedical Science, 16(1), 47–50.)

Popov, N. (2009) Kinesiology and kinesiology of the locomotor apparatus. "NSA-Press" ed. Sofia, 176.

Milevsky, (2022) "Table of contents of the topic "Shoulder Operation Technique."

Liavaag, S. Brox, JL. Pripp, AH. Enger, M. Soldal, LA. Svenningsen, S. (2021) Immobilization in external rotation after primary shoulder dislocation did not reduce the risk of recurrence: a randomized controlled trial. J Bone Joint Surg Am, 93:897-904.

Itoi, E. Kitamura, T. Hitachi, S. Hatta, T. Yamamoto, N. Sano, H. (2015) Arm abduction provides a better reduction of the Bankart lesion during immobilization in external rotation after an initial shoulder dislocation. Am J Sports Med, 43:1731-6.

Finestone, A. Milgrom, C. Radeva, P. DR, et al.(2009) Bracing in external rotation for traumatic anterior dislocation of the shoulder. J Bone Joint Surg Br.;91:918-21.

De Kleijn, P. Mauser-Bunschoten, E. (2017) Physiotherapy management in hemophilia, Van Creveldkliniek, Utrecht, Netherlands.

Cox, Charles L. Kuhn, John E. (2008) Vanderbilt University Medical Center, Nashville, TN. (37232-8828 September 2008 - Volume 7 - Issue 5 - p 263-268 doi: 10.1249/JSR.0b013e318186d26d)

# ALS – NEED FOR LONG-TERM KINESITHERAPEUTIC CARE

## **Denislav Stoicov - student**

Department of Kinesitherapy, Faculty of Public Health, Medical University of Varna "Prof. Dr. Paraskev Stoyanov", Varna Tel: +359 895045099 E-mail: denisstoicov@abv.bg

## Siyana Marinova - student

Department of Kinesitherapy, Faculty of Public Health, Medical University of Varna "Prof. Dr. Paraskev Stoyanov", Varna Tel: +359 895085596 E-mail: siyana.marinova12@abv.bg

## Nefize Ilyazova - student

Department of Kinesitherapy, Faculty of Public Health, Medical University of Varna "Prof. Dr. Paraskev Stoyanov", Varna Tel: +359 899893227 E-mail: ilqzova77@abv.bg

# Assist. Prof. Miglena Mileva

Department of Kinesitherapy, Faculty of Public Health, Medical University of Varna "Prof. Dr. Paraskev Stoyanov", Varna Tel: +359 899616387 E-mail: megi\_din@abv.bg

**Abstract:** Amyotrophic lateral sclerosis (ALS) is known as a motor neuron disease characterized by progressive neurological symptoms, leading in most cases to disability or death. Intensive and long-term kinesitherapeutic care is important for the entire therapeutic process and for improving the quality of life of patients diagnosed with this disease. Regardless of the fact that complete recovery cannot be achieved, stimulating brain plasticity through neurorehabilitation methods, the possibility of functional motor recovery gives positive results in cases of disability.

Keywords: ALS, neurodegenerative disease, kinesitherapeutic care

# REFERENCES

Erolovna, K. (2020). Amyotrophic lateral sclerosis - symptoms and treatment.

https://probolezny.ru/bokovoy-amiotroficheskiy-skleroz/ (Accessed on 28.05. 2020).

Georgieva, S. (2017). Specificity of home rehabilitation of a pathent with amyotrophic lateral sclerosis syndrome. Thirteenth International Scientific Conference the teacher of the future, 25-28 May 2017, Budva, Montenegro, 1249-1254.

Gorbach, A. N., Skvartsov, V.V., Skvartsova, E. M., Sabanov, A.V. (2019). Diagnosis and treatment of amyotrophic lateral sclerosis, modern therapy in psychiatry and neurology. No 1, 26-31.

Hardiman, O., Chalabi, A., Chio, A., Corr, E., et al. (2017). Amyotrophic lateral sclerosis. National library of medicine, 3(10), 1-19.

Iłżecka, J. (2017). Kinesitherapy in amyotrophic lateral sclerosis. Journal of Education, Health and Sport, 7(12), 83-93.

Jelev, V. (2015). Physiotherapy for neurological, neurosurgical and mental diseases. Sofia: "Avangard Prima", 90-92.

Kanchev, D. (2019). Physiotherapy in diseases of the brain, 390.

Lyubenova, D., Dimitrova, A., Petrova K.G. (2011). Kinesitherapy in nervous and mental diseases. Sofia: "Petrovi i Sie",75-77.

Milanov, I. (2021) Neurology. Varna: "Steno" Publishing House, 759-764.

Pozza, A., Delamura, M., Ramirez, C. (2006). Physiotherapeutic conduct in amyotrophic lateral sclerosis. Sao Paulo Med. J., 124(6), 350-354.

Roglev, B., Vasileva, D. (2020). Kinesitherapeutic treatment of lateral amyotrophic sclerosis. In: Sixth national congress with International Participation, 15 years Bulgarian Society of Neurosonology and Cerebral Hemodynamics, 9-11 October 2020, Sofia, Bulgaria.

Shotekov, P. (2004). Neurology. Sofia: "ARSO", 300-303.

Titqnova, E. (2021). Textbook of Nervous Diseases, Clinical Neurology. Sofiq: "Koti" EOOD, 313-317.

# IMPORTANCE OF OCCUPATIONAL THERAPY FOR THE SPEECH DEVELOPMENT OF CHILDREN WITH DEVELOPMENTAL PROBLEMS

Assist. Prof. Margarita Asparuhova-Kandilarova, MSc Department of Public health University of Ruse "Angel Kanchev" Phone: 0885726921 E-mail: masparuhova@uni-ruse.bg

Abstract: Being a multifaceted profession, by enabling people's participation in their meaningful activities, occupational therapy also plays a huge role in developing strengths in many other aspects of their personal growth, and improved communication skills is one of them. The aim of this paper is to give an overview of the main therapeutic approaches acquired in pediatric occupational therapy and their impact on children's speech and language skills. Keywords: occupational therapy, speech and language development

#### REFERENCES

Ayres, A. J. (2007) Sensory Integration and the Child. Understanding Hidden sensory Challenges, 2nd printing, Western Psychological Services, ISBN 978-0-87424-437-3

Iverson, J. M. (2010). Developing language in a developing body: the relationship between motor development and language development. *Journal of Child Language*. 37: 229-61

Міпсheva, Р. (2015) Aspects of Game Application in Occupational Therapy, *Pedagogy*, 87(9), 1231-1236 (Оригинално заглавие: Минчева, П. (2015) Аспекти на приложението на играта в ерготерапията, Педагогика, 87(9), 1231-1236)

Міпсheva, Р. (2018) Pediatric Occupational Therapy, University of Ruse academic press, Ruse, ISBN 978-954-712-745-6 (Оригинално заглавие: Минчева, П. (2018) Ерготерания в педиатрията, Академично издателство "Русенски университет", Русе, ISBN 978-954-712-745-6)

Stoyanova, Y. (2011) Early Language Developement, SLT Centre Romel, Sofia, ISBN 978-954-9458-17-6 (Оригинално заглавие: Стоянова, Ю. (2011) Ранно езиково развитие, ISBN 978-954-9458-17-6)

Тsenova, Ts. (2009) Speech Therapy. Definition, Diagnosis and therapy of communication disorders, Publishing House Radar Print, Sofia, ISBN 978-954-9998-21-4 (*Оригинално заглавие:* Ценова, Ц. (2009) Логопедия. Описание, диагностика и терапия на комуникативните нарушения, Издателска къща Радар Принт, София, ISBN 978-954-9998-21-4)

West, K. L., & Iverson, J. M. (2021). Communication changes when infants begin to walk. *Developmental Science*, 24(5).

World Federation of Occupational Therapists, 2012, https://www.wfot.org/about/about-occupational-therapy

Yosifova, R. (2012) Movement and Language. SLT Centre Romel, Sofia ISBN 978-954-9458–18-3 (Оригинално заглавие: Йосифова, Р. (2012) Движение и език. Логопедичен център Ромел, София, ISBN 978-954-9458–18-3)

Zuccarini, M., Guarini, A., Iverson, J. M., Benassi, E., Savini, S., Alessandroni, R., ... Sansavini, A. (2018). Does early object exploration support gesture and language development in extremely preterm infants and full-term infants? *Journal of Communication Disorders*, 76, 91–100

# MODERN APPROACHES OF PHYSIOTHERAPEUTIC TREATMENT OF URINARY INCONTINENCE

#### Assoc. Prof. Petya Parashkevova, PhD

Department of Public Health University of Ruse "Angel Kanchev" Tel.: +359882898619 E-mail: pparashkevova@uni-ruse.bg

#### Assoc. Prof. Radoslava Deleva, PhD

Department of Public Health University of Ruse "Angel Kanchev" Tel.: +359878580696 E-mail: rdeleva@uni-ruse.bg

Abstract: Disorders in the function of the pelvic floor muscles can manifest with pelvic organ prolapse, urinary incontinence, fecal incontinence, difficult defecation, and chronic pelvic pain. Regardless of the form and severity of the condition, it affects the patient's daily life and can have consequences on his physical, financial, social and emotional well-being. Conservative management of urinary incontinence includes: (1) bladder training (based on a diary of voiding), (2) dietary and lifestyle recommendations, (3) pelvic floor muscle training with or without biofeedback, and (4) pharmacotherapy. Lifestyle changes include limiting fluid intake, reducing alcohol and coffee intake, quitting smoking, and reducing body weight. Bladder training is an important form of behavioral therapy. The goal is to increase the time between emptying the bladder and the amount of fluid it can hold. Physiotherapy uses Kegel exercises, exercises with vaginal cones, exercises to strengthen the abdominal, back and gluteal muscles. Kegel exercises are isometric pelvic floor exercises that completely target the pelvic muscles. Training with the help of vaginal cones is a specific training of the pelvic floor muscles. to hold the cone, the muscles must contract. Biofeedback uses tools to measure and provide real-time feedback on patients' physiological responses. with its help, they visualize the muscle activity, contraction and relaxation of the muscles of the pelvic floor.

Keywords: urinary incontinence, behavioral therapy, Kegel exercises, vaginal cone exercises, biofeedback

# REFERENCES

Association for Applied Psychophysiology and Biofeedback. About Biofeedback [cited 2019 May 17]

Barbosa AMP, Enriquez EMA, Rodrigues MRK, Prudencio CB, Atallah ÁN, Reyes DRA, et al. Diamater Study Group. Effectiveness of the pelvic floor muscle training on muscular dysfunction and pregnancy specic urinary incontinence in pregnant women with gestational diabetes mellitus: a systematic review protocol. PLoS One. 2020 Dec;15(12)

Castro RA, Arruda RM, Zanetti MR, Santos PD, Sartori MG, Girão MJ. Single-blind, randomized, controlled trial of pelvic floor muscle training, electrical stimulation, vaginal cones, and no active treatment in the management of stress urinary incontinence. Clinics (Sao Paulo). 2008 Aug;63(4):465-72.

Doughty DB. Promoting continence: simple strategies with major impact. Ostomy Wound Management 2003;49:46-52.

Herbison GP, Dean N. Weighted vaginal cones for urinary incontinence. Cochrane Database Syst Rev 2013;(7):CD002114.

Hu JS, Pierre EF. Urinary Incontinence in Women: Evaluation and Management. Am Fam Physician. 2019 Sep 15;100(6):339-348.

Hubchev G., Serbezova- Velikova M., 2015. Urinary incontinence - a problem to be solved in modern times gynecology. SCIENTIFIC PAPERS OF RUSE UNIVERSITY, 2015: vol. 54, series 8.3, pp. 135-139 (*Оригинално заглавие:* Хубчев Г., М. Сербезова- Великова. 2015. Уринарната инкотиненция – решим проблем в съвременната гинекология. Научни трудове на Русенски университет, 2015, том 54, серия 8.3, стр. 135-139)

Lukacz ES, Santiago-Lastra Y, Albo ME, Brubaker L. Urinary incontinence in women: a review. JAMA 2017;318(16):1592-1604

Milsom I, Gyhagen M. The prevalence of urinary incontinence. Climacteric 2019;22(3):217-222.

Neelam Muneeb, H., Amjad, M., Mumtaz Khaliq, H., Shaukat, K., Shabbir, M., Shafique, S., & Faizan Hamid, M. (2022). Association Between Pelvic Floor Dysfunction and Metabolic Syndrome: Pelvic Floor Dysfunction and Metabolic Syndrome. *Pakistan BioMedical Journal*, *5*(8), 55–59.)

Nygaard IE, Lemke JH. Urinary incontinence in rural older women: Prevalence, incidence and remission. J Am Geriatr Soc 1996;44(9): 1049–54.

Ророvа- Dobreva D., 2011. Pelvic floor kinesitherapy. Sofia: Туре- top press (*Оригинално заглавие:* Попова- Добрева Д., 2011. Тазово- дънна кинезитерапия. София: изд. Къща "Типтоп прес")

Roch, M., Gaudreault, N., Cyr, M.-P., Venne, G., Bureau, N.J., Morin, M. The Female Pelvic Floor Fascia Anatomy: a Systematic Search and Review. Life 2021, 11,900. (*PDF*) *The Female Pelvic Floor Fascia Anatomy: a Systematic Search and Review*.

Vadala M, Palmieri B, Malagoli A, Laurino C. High-power magnetotherapy: a new weapon in urinary incontinence? Lower urinary tract symptoms. John Wiley&Sons Australia, Ltd.2017.

Zizzi PT, Trevisan KF, Leister N, Cruz CS, Riesco MLG. Women's pelvic floor muscle strength and urinary and anal incontinence after childbirth: a cross-sectional study. Rev Esc Enferm USP. 2017;51:e03214

## FRI-2G.309-1-MCDA-01

# DYNAMICS OF ERRORS IN CLINICAL LABORATORY PRACTICE DURING THE PERIOD OF THE COVID 19 PANDEMIC

#### Chief Assistant Denitsa Trancheva MD, PhD

Department of Medical and Clinical Diagnostic Activities, University of Ruse "Angel Kanchev", Phone: 0888 342 616 E-mail: dtrancheva@uni-ruse.bg

**Abstract:** In modern medicine, great importance is assigned to the laboratory researches, the results of which are objective indicators for assessing the state of the organism. This gives grounds to consider the clinical and laboratory diagnostics as an important and significant part of all medical and biological disciplines. Without the results of the clinical and laboratory analysis, it is impossible to achieve an accurate diagnosis and to take effective decisions regarding the health of patients. The purpose of laboratory analysis is to minimize laboratory errors and obtain the most accurate result within certain limits, which can be used to make the necessary medical decisions.

The challenge of Covid 19 is putting to the test in 2020-2022 the whole world, the whole global health system, specialists from all fields of medicine. The increase in the number of patients with Corona virus is straining the health systems in many countries of the world to the limit. In clinical-laboratory practice, an increase in the number of errors and inconsistencies is observed at every stage of the laboratory process, especially in the pre-analytical phase.

Despite the efforts of all healthcare professionals, it is likely that the Covid-19 pandemic will further accompany the human journey for an indefinite period of time. Covid-19 is an example of a disease that requires a multidisciplinary approach in which laboratory medicine and clinical researches are soundly established and play a significant and important role.

*Keywords:* Covid 19 pandemic, Clinical- laboratory errors, Clinical- laboratory practice, Laboratory medicine, Clinical and laboratory research.

JEL Codes: L10, L11

#### REFERENCES

Кrastev, Z., Shipkov, T., (2017). The clinical laboratory and clinical medicine. Sophia: MEDINPHORM, ISBN 978-619-7164-09-1,1-7 (*Оригинално заглавие*: Кръстев, З., Шипков, *Т., 2017, Клиничната лаборатория и клиничната медицина. София: Издателство " МЕДИНФОРМ"*.)

Lippi G, Simundic AM, Plebani M., (2020), Potential preanalytical and analytical vulnerabilities in the laboratory diagnosis of coronavirus disease 2019 (COVID-19), Clin Chem Lab Med.; 58(7):1070–1076.

Plebani, M. (2006). *Errors in clinical laboratories or errors in laboratory medicine?* - Clin 8. Chem lab Med; 44 (6): 750-759.

Plebani, M., Sciacoveli, L., Aita, A., et al., (2014), *Quality indicators to detect pre-analytical errors in laboratory testing*- Clin Chim Acta, may 15; 432:44-48.

Sakyi, AS., laing, EF., Ephraim, RK., et al., (2015), *Evaluation of analytical errors in a clinical chemistry laboratory: a 3 year experience-* Ann med health Sci Res, jan-Feb; 5 (1): 8-12.

World Health Organization. Geneva: (2020)., *Laboratory testing for coronavirus disease* 2019 (COVID-19) in suspected human cases: interim guidance, 2 March 2020.

# BUILDING THE PROFESSIONAL IMAGE OF THE HEALTHCARE SPECIALIST THROUGH THE METHODOLOGY OF TRAINING

## Assoc. Prof. Kristina Zaharieva, PhD

Department of Medical and clinical diagnostic activities, University of Ruse "Angel Kanchev" Phone: 0885 193 003 E-mail: kzaharieva@uni-ruse.bg

# Prof. Elena Zheleva PhD

Medical University "Prof. Dr. Paraskev Stoyanov "- Varna Branch Sliven - Department of Health care GSM: +359 885 036 840 E-mail: ejeleva@abv.bg

Abstract: Building the professional image of the health care specialist through the health care training methodology is defined as a continuous, organized, purposeful, consistent and bilateral process.

A process of active interaction and equal participation of the health care educator and future medical specialists, through which the trainees acquire not only a certain system of knowledge, skills and competences, but also build and develop as highly qualified specialists for the needs of health care, carriers of established for the profession, personal qualities.

The degree of assistance of the health care training methodology in the preparation of health care specialists in higher education for building their professional competences was established.

The systematic and regular self-monitoring of healthcare professionals: stimulates their awareness and independence; the critical approach to their own learning activity; provides timely feedback and information on gaps in learning content; provides an opportunity to self-monitor and assess their knowledge, skills and readiness to apply them; stimulates their independent cognitive activity.

*Keywords:* Build, Professional, Appearance, Healthcare Professional, Training Methodology, high school. *JEL Codes:* L 10, L 13

# REFERENCES

Andreev, M., (2010). "The learning process. Didactics", Sofia, UI "St. Kliment Ohridski", p. 54-71(*Оригинално заглавие:* Андреев, М., "Процесът на обучение. Дидактика", София, УИ "Св. Климент Охридски"с. 54-71.)

Levterova, D., (2009). Social competence, Univ. ed. "P. Hilendarski ", Plovdiv, p. 26-28 (**Оригинално заглавие:** Левтерова, Д., 2009, Социална компетентност, Унив. изд. "П. Хилендарски", Пловдив, с. 26-28.)

Міtova, М., Mladenova S., (2008). "Methodology of practical training of health care professionals", Sofia, ed. "Article 2001", p.18-36; p.57-99 (*Оригинално заглавие: Митова, М., Младенова, С., 2008, "Методика на практическото обучение на специалистите по здравни грижи", София, изд. "Артик 2001", 2008. с.18-36; с.57-99.*)

Rangelova E., (2009). "Methodology of educational activities" EX-PRESS, 2009, р. 6-7; р. 128-130 (**Оригинално заглавие:** Рангелова Е., 2009, "Методика на възпитателната дейност", ЕКС-ПРЕС, с. 6-7; с. 128-130.)

Vodenitcharov Ts., myths M., Mladenova S., (2008). "Medical Education", Sofia, ed. "Article 2001", p. 24-56; p. 78-106 (*Оригинално заглавие:* Воденичаров Ц., Митова М., Младенова С., 2008, "Медицинска педагогика", София, изд. "Артик 2001", с. 24-56; с. 78-106.)

# IMMUNIZATION COVERAGE IN RUSE REGION IN 2021 IN THE CONDIONS OF THE PANDEMIC

#### Preslava Zhekova – PhD student

Department of Business Development and Innovations, University of Ruse "Angel Kanchev" E-mail: p.fiskucheva@abv.bg

**Prof. Nikola Sabev, DSc** Department of Public health, University of Ruse "Angel Kanchev" E-mail: nsabev@uni-ruse.bg

**Abstract:** Vaccination prophilaxis is a basic tool to fight against infectious pathology. It is a type of public policy that aims through normative regulation to establish diseases against which individuals in society must be vaccinated. Mass epidemics of infectious diseases with severe complications and high mortalitysuch as cholera, plague, typhoid, variola, poliomyelitis, diphtheria and others have remained in the past, thanks to complex immunoprophylaxis among the populationat a regional, national and global level. The elements of immune prophylaxis system, bioproduct effectiveness and immunization coverage interact dynamically to influence population immunity to vaccine-preventable diseases and govern public health.

Keywords: Prophylaxis, Vaccines, Diseases, Immunity JEL Codes: L10, L11

## REFERENCES

Panayotov, K. (2021). COVID-19 and current problems in EU health policy. Nealth care, 21(4), 28-32 (**Оригинално заглавие:** Панайотов, К., 2021. COVID-19 и актуални проблеми в здравната полотика на ЕС. Списание Здравни грижи 21 (4), 28-32.)

Тоdorov, N., Galev, A., (2022). Vaccine safety. *Preventive Medicine, X, 22,1 (21), 8-10* (**Оригинално заглавие:** Тодоров, Н., Галев, А., 2022. Безопасност на ваксините. Списание Превантивна медицина 22, X, 1 (21), 8-10.)

URL:

http:// https://coronavirus.bg/bg/vaccinations/publications/15. a guide to the science of vaccination (vaccinology): from basic principles to new developments, (2020).

http://zdravenmediator.net/pic/articles/Презентация-България.pdf.

https://www.who.int/immunization/ global\_vaccine\_action\_plan / GVAP\_doc\_2011\_2020 / bg /

# NUTRITION AND PHYSICAL ACTIVITY IN BREAST CANCER PATIENTS

## Assoc. Prof. Teodora Nedeva, MD, PhD

Department of Medical Clinical and Diagnostical Activities, "Angel Kanchev" University of Ruse Phone: 0887 468 695 E-mail: tsherbanova@uni-ruse.bg

Abstract: Malignancies, which are more than 200 types, are one of the main causes of death after cardiovascular and neurology diseases nowadays. The number of cancer patients grows every year worldwide and breast cancer still remains the most common malignant tumor among women. Although therapeutic options are improved, it still has high mortality rate. There are many clinical guidelines, recommendations and trials discussing nutrition and physical activities in patients with breast cancer. Nutrition and healthy eating habits are very important in cancer care. for this purpose we conducted an interview study. Materials and methods: We included 42 patients with breast cancer. Some of them were on active treatment yet and others are survivors for 5 and more years. The patients underwent interview that focused on information about eating habits, nutrition and everyday physical activities, expectations and impact on patient's quality of life. Results: Interviewed were 38 women and 3 men, at the age of 30 to 86, 22 of whom undergoing at the moment either operation, chemotherapy or radiation therapy. The rest 22 were survivors from the disease for 5 or more years. All the patients had different type of knowledge about nutrition in cancer disease. Women of younger age, were better informed about good nutrition and healthy eating habits during and after cancer treatment. Mainly old women and men admitted in the study, had no accurate knowledge that diet can help them live longer and had better quality of life. Conclusions: Good nutrition and forming of healthy eating habits is of great importance about breast cancer patients. Cancer and its treatment may cause different side effects among which are anorexia and cachexia, considered as the common cause of malnutrition. a registered dietitian should be part of the health care team. Unfortunately in our country there are not much such specialists and many of them do not take part of cancer treatment. There are no Bulgarian guidelines for clinical nutrition in cancer. Our study may provide valuable information for our patients and colleagues and can be basis for future larger investigations.

Keywords: Breast cancer, Clinical nutrition, Diet, Malnutrition, Physical activity, Survivors JEL Codes: L10, L11

#### REFERENCES

Carolyn Lammersfeld, (2021). *Nutrition for cancer patients: How to fuel your body for the fight* February 17, 2021, Cancer Treatment Centers of America.

ESPEN practical guideline: *Clinical Nutrition in cancer, Clinical Nutrition 40* (2021) 2898-2913, Maurizio Muscaritoli, Jann Arends, Patrick Bachmann, Vickie Baracos, Nicole Barthelemy, Hartmut Bertz, et all.

Nutrition and Physical Activity Guideline for Cancer Survivors, (2022) A Cancer Journal for Clinicians, Volume 72, Issue 3 p.263, first published: 16 March 2022

https://doi.org/10.3322/caac.21721.

Nutrition in Cancer Patients, Narayana Health, April 16, (2021),

https://www.narayanahealth.org/blog/nutrition-in-cancer-patients/

Nutrition Recommendations During and After Treatment, Approved by the Cancer.Net Editorial Board, 06, (2022), https://www.cancer.net/survivorship/healthy-living/nutrition-recommendations-during-and-after-treatment

Paula Ravasco, (2019), *Nutrition in Cancer Patients*, J Clin Med. 2019 Aug; 8(8): 1211. Published online 2019 Aug 14. doi: 10.3390/jcm8081211.

Zaharieva Kr., Myhailova G., Velcheva K., Sherbanov O., (2017), *Psychosocial aspects of healthcare for oncology patients*, World Science, Dubai, № 11(27), Vol.4, November 2017, p. 19-22.

Zaharieva Kr., Nedeva T., Atanasova T., (2019), Side effects of therapeutic approaches and quality of life of patients with oncological diseases, Proceedings of University of Ruse, 2019, Vol. 58, book 8.3, p. 103-108 (*Оригинално заглавие:* Нежелани ефекти от терапевтичните подходи и качеството на живот на болни с онкологични заболявания, Русенски Университет, Октомври 2019.)

# SGLT2 - INHIBITION - A NEW HOPE FOR PATIENTS WITH HEART FAILURE

#### Assoc. Prof. Ognyan Sherbanov MD, PhD

Department of Medical Clinical and Diagnostical Activities, University of Ruse "Angel Kanchev" Phone: 0889 232744 E-mail: osherbanov@uni-ruse.bg

Abstract: Many cardiovascular diseases lead to heart failure (HF). Worldwide, the prevalence of the syndrome varies between 1 and 4% of the population, and it is increased in countries with an aging population. Patients with heart failure have characteristic subjective complaints and objective signs that help us diagnose the condition. Most of people, especially those with reduced Ejection Fraction (HFrEF), have a poor prognosis, associated with increased mortality and rehospitalization, despite standard treatment. Treating patients with heart failure has been always a challenge for the doctor. The main goals of modern guidelines are: reduction of mortality and rehospitalizations, along with improvement of patients' functional capacity and quality of life. It is estimated that about 90% of patients remain symptomatic although they are on a standard therapy. In recent years, along with the standard treatment of HF with diuretics, beta blockers, ACE inhibitors, ARBs and MRAs, new therapeutic strategies with early inclusion of ARN-inhibitors and SGLT2-inhibitors have been very actively used. These medications significantly improve the prognosis and quality of life of patients with HFrEF and lead to a real revolution in the therapy.

Keywords: ACE inhibitors, ARBs, ARN-inhibitors, Beta blockers, Ejection fraction, Heart failure, HFrEF, MRAs, SGLT2-inhibitors

**JEL Codes:** L10, L11

#### REFERENCES

Krumholz HM et al., (2009). Circ Cardiovasc Qual Outcomes. 2009;2:407-413.

McDonagh et al. (2021). *ESC Guidelines Heart Failure*. Eur Heart Journal 27 August 2021: 00, 1-28.

McMurray JJV et al.,(2019). Dapagliflozin in Patients with Heart Failure and Reduced Ejection Fraction. N Engl J Med. 2019;381(21):1995–2008.

McMurray JJV et al., (2021). *How Should We Sequence the Treatments for Heart Failure and a Reduced Ejection Fraction?* Circulation. 2021; 143:875-877.

Ponikowski et al., (2012). ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC.Eur Heart J. 2016 Jul 14;37(27):2129-200.

Roger VL, Weston SA, Redfield MM, et al., (2004). *Trends in heart failure incidence and survival in a community-based population*. JAMA. 2004;292(3):344-350.

Tamargo J., (2019). Sodium-glucose Cotransporter 2 Inhibitors in Heart Failure: Potential Mechanisms of Action, Adverse Effects and Future Developments Eur Cardiol. 2019;14(1):23-32.

Zaharieva K., Sherbanov O., Nedeva T., (2018). The Influence of Physical Activity on Physical Work Capacity and Functional Condition of the Cardiovascular System, Евразийский Союз Ученых, Ежемесячный научный журнал, 3(48), 2018, 1 часть, стр. 11-15, ISSN 2411-6467.

# THE ROLE OF THE MEDICAL ASSISTANT IN PATIENTS WITH ACUTE RENAL COLIC

#### Assistant Milena Stoyanova

Department of Public Health and Health Care University of Ruse "Angel Kanchev" Phone: +359888617143 E-mail: milena.stoyanova@hospitalruse.org

**Abstract:** Renal colic is a common health complaint – it occurs in approximately 12 % of male and 7 % of female patients in the emergency department. Renal colic is caused mostly by fixed or dynamic urinary tract obstruction. The location of it largely determines the nature of the symptoms experienced by the patient. Kidney stones (nephrolithiasis or urolithiasis) are hard deposits made of minerals and salts that form inside your kidneys and can affect any part of the urinary tract. If a kidney stone becomes lodged in the ureters, it may block the flow of urine and cause the kidney to swell and the ureter to spasm, which can present with renal colic. The experienced pain is severe and sharp, felt in the side and back, below the ribs; radiates to the lower abdomen and groin; often comes in waves and fluctuates in intensity. The initial evaluation of this condition includes urinalysis, a complete blood cell count, serum electrolytes, serum urea and creatinine. Abdominal ultrasound is preferable diagnostic method for all patient groups including children and pregnant women. Noncontrast CT, KUB (Kidney, Urether, Bladder) radiography and excretory urography are also imaging studies of choice. Analgetic therapy and volume expansion are included in the management algorithm of renal colic.

Keywords: Renal colic, Kidney stones, Symptoms, Urinalysis, Abdominal ultrasound, Analgesia JEL Codes: L10, L11

#### REFERENCES

Вогоч, Н., (2021). Guide to emergency medical care. Burgas: University Publishing House "Prof. Dr. Asen Zlatarov" (Оригинално заглавие: Бозов, Х., 2021. Ръководство по спешна медицинска помощ. Бургас: Издателство "Университет "Проф. д-р Асен Златаров".)

URL:

http://www.mh.goverment.bg Handbook of Clinical Behavior Protocols in Emergency Medicine.

https://urology.bg Renal colic treatment.

# **OBSTRUCTIVE SLEEP APNEA IN CHILDHOOD**

#### **Ch. assistant Tatiana Atanasova** Department of Medical Clinical and Diagnostical Activities "Angel Kanchev" University of Ruse Phone: 08885635514 E-mail: nursing\_russe@abv.bg

**Abstract:** The syndrome of obstructive sleep apnea (OSA), in recent years, is gaining more and more popularity, in connection with its prevalence and diagnosis in childhood and the significant negative consequences on the health of adolescents. It represents a serious sleep disorder with adverse consequences, expressed in snoring, mouth breathing, cessation of breathing, frequent night awakenings. The reasons can be different, but most often in childhood they are due to hypertrophy of the tonsils, including adenoid vegetation, as well as impaired muscle tone of the muscles in the back of the oral cavity. Long-term consequences can include enuresis, behavioral disorders, attention deficit disorder, growth retardation, cardiovascular disease, and more. Worldwide, the prevalence of obstructive sleep apnea syndrome in children ranges from 1.2% to 5.7%. The purpose of the study is to determine the degree of awareness and behavior of students in children with obstructive sleep apnea syndrome. Material and methods: In the period April - September 2022, a study was conducted with 66 students from the "medical assistant" and "nurse" specialties. Statistical, documentary and survey methods were used. Conclusions: 77.3% of the respondents were not informed about the prevalence of OSA in childhood. 51.5% could characterize the OSA syndrome with more than one symptom. 33.3% of students would transport the child to an emergency department for specialist consultation and treatment, and 25.8% would administer medication in an outpatient setting and advise the parents to see a specialist. Conclusion: Sleep apnea is a potentially serious disorder in which breathing is interrupted repeatedly during sleep. The conducted study is an indicator for conducting non-auditory forms of training on issues significant for the child's health and less common problems.

Keywords: Apnea, Snoring, Sleep disorder, Child JEL Codes: L 10, L 11

#### REFERENCES

Вікоva-Ivanova, Р., Ророva, Т. (2020). Nursing care for ear-nose-throat diseases. Ed. MU-Sofia. (Оригинално заглавие: Бикова -Иванова П., Попова, Т. (2020). Сестрински грижи при ушно-носно-гърлени заболявания. Изд. МУ-София.)

Киtsarov, А., Eliev, G. (2018). Ear, nose and throat diseases, study guide. MU – Sofia. (**Оригинално заглавие:**Куцаров, А., Илиев, Г. 2018. Ушни, носни и гърлени болести, учебно ръководство. Издателство МУ – Варна.)

Раskalieva-Georgieva, Е. (2020). Causes of sleep disorders in childhood. List. INSPIRO, 4. (Оригинално заглавие: Паскалиева – Георгиева Е., 2020. Причини за нарушения на съня в детската възраст. Спис. INSPIRO, 4.)

Реtkova, D. (2008). Obstructive sleep apnea and enuresis syndrome - clinical presentation and polysomnographic changes. List. INSPIRO, 4. (*Оригинално заглавие:* Петкова Д., 2008. Синдром на обструктивна сънна апнея и енореза – клинично представяне и полисомнографски промени. Спис. INSPIRO, 4.)

Raikov, A., (2013). Obstructive sleep apnea in childhood. List. GP News, 4. (*Оригинално* заглавие: Райков А., 2013. Обструктивна сънна апнея в детската възраст. Спис. GP News, 2.)

URL:

https://www.omed.bg/snna-apneia-pri-detsata-prichini-simptomi-i-diagnostika-page10133.html

https://www.medinfo.bg/spisanie/2013/3/statii/hyrkane-i-obstruktivna-synna-apneja-1468

# MODIFIING ROLE OF THE FAM167A-BLK RS2736340 POLYMORPHISM IN THE DEVELOPMENT OF SYSTEMIC LUPUS ERYTHEMATOSUS

# Zornitsa Kamenarska, PhD

Molecular Medicine Center, Medical University-Sofia E-mail: kamenarska@yahoo.com

## Maria Hristova, MD, PhD

Clinic of Nephrology, University Hospital St. Ivan Rilski, Sofia E-mail: bulgaria\_neo@yahoo.co.uk

## Joana Pozharashka, MD

Department of Dermatology and Venereology, Medical University-Sofia E-mail: pojarashka@gmail.com

## Anton Vinkov, MD

Hôpitaux Drôme Nord, 607 avenue Geneviève de Gaulle-Anthonioz, 26102 Romans-sur-Isère, France E-mail: aivinkov@gmail.com

## Radosveta Bozhilova, MSc

Molecular Medicine Center, Medical University-Sofia E-mail: rbozhilova@gmail.com

# Assoc. Prof Radka Kaneva, PhD

Molecular Medicine Center and Department of Medical Chemistry and Biochemistry, Medical University-Sofia E-mail: kaneva64@yahoo.com

#### Assoc. Prof Luybomir Dourmishev, MD, PhD

Department of Dermatology and Venereology, Medical University-Sofia E-mail: 1 dourmishev@vahoo.com

Abstract: The aim of this case-control study was to investigate the association between the BLK rs2736340 C/T polymorphism and the susceptibility to SLE in Bulgarian patients. Altogether 58 patients with SLE and 100 unrelated healthy controls were included in this study. The polymorphism shows no association with the development of the disease. An association was observed between the TT genotype and photosensitivity. Our results indicate that the BLK polymorphism might play a disease modifying role in the susceptibility to SLE.

Keywords: Healthy, BLK polymorphism, SLE JEL Codes: L10, L11

# REFERENCES

Chen, Sл, Wu, W., Li, J., et al (2015). Single nucleotide polymorphisms in the FAM167A-BLK gene are associated with polymyositis/dermatomyositis in the Han Chinese population Immunol Res 62, 153–162.

Dang, J., Li, J., Xin, Q., Shan, S., Bian, X., Yuan, Q., Liu, N., Ma, X., Li, Y., Liu, Q. (2016). *Gene-gene interaction of ATG5, ATG7, BLK and BANK1 in systemic lupus erythematosus.* Int J Rheum Dis 19, 1284-1293.

Hom, G., Graham, RR., Modrek, .B, et al (2008). Association of systemic lupus erythematosus with C8orf13-BLK and ITGAM-ITGAX. N Engl J Med 358, 900-909.

Laird, RM., Laky, K., Hayes, SM. (2010). Unexpected role for the B cell-specific Src family kinase B lymphoid kinase in the development of IL-17-producing  $\gamma\delta$  T cells. J Immunol 185,6518-6527.

Nordmark, G., Kristjansdottir, G., et al (2011). Association of EBF1, FAM167A (C8orf13)-BLK and TNFSF4 gene variants with primary Sjögren's syndrome. Genes Immun 12, 100-109.

Song GG, Lee YH (2017). Association between BLK polymorphisms and susceptibility to SLE : a meta-analysis. Z Rheumatol. 201776(2):176-182.

Wu, YY., Georg, I., Díaz-Barreiro, A., et al. (2015). Concordance of increased B1 cell subset and lupus phenotypes in mice and humans is dependent on BLK expression levels. J Immunol 194, 5692-5702.

Zeng, C., Fang. C=, et al (2017). B-cell lymphocyte kinase polymorphisms rs13277113, rs2736340, and rs4840568 and risk of autoimmune diseases: a meta-analysis. Medicine (Baltimore) 96, e7855.

Zhou. Y., Li, X., Wang, G., Li, X. (2016). Association of FAM167A-BLK rs2736340 Polymorphism with Susceptibility to Autoimmune Diseases: a Meta-Analysis. Immunol Invest 45, 336-348.

# PATIENT HEALTH LITERACY AND THE NURSING PROCESS

#### Pr. Assist. Pepa Dzhedzheva, PhD

Department of Nursing Care, Medical university "Prof. Dr. Paraskev Stoyanov" of Varna Sliven Affiliate Tel.: +359887998985 E-mail: p.djedjeva@gmail.com

Abstract: The article focuses on major emphases of patient health literacy as an important factor in the nursing process.

Health literacy can be defined as people's ability to access health care, understand and use information in a way that promotes and maintains their good health. Inadequate health literacy can have profound health and financial consequences. Research shows that patients with low health literacy have poorer health status; are at greater risk of hospitalization; have less knowledge about disease management and health behaviors; do not actively participate in the process of making decisions related to their health, etc.

Assessing patients' level of health literacy in the implementation of the nursing process enables nurses to provide interventions that aim to increase patients' autonomy regarding their health and making informed decisions to achieve desired health outcomes.

*Keywords: Health literacy, Nursing process, Nursing JEL Codes: L* 10, *L* 13

#### REFERENCES

Borisova, S., (2013) Prilagane na sestrinskiq process v praktikata na medicinskata sestra, Varna (**Оригинално заглавие:** Борисова С.,2013. Прилагане на сестринския процес в практиката на медицинската сестра, Варна.)

Gurov, V.& kolektiv, (2001). Prilovenie na sestrinskiq process v medicinskata praktika .Sofiq: MU Sofia, Sestrinsko delo. (*Оригинално заглавие:* Гюров В. и колектив. Приложение на сестринския процес в медицинската практика. София: Сестринско дело. 3. 2001, 25 – 30.)

Kickbusch, I.(2001). *Health Literacy: Addressing the health and education divide.* – In: Health Promotion International, 16 (3), 289-297.

Lennar, Sihota, Saranjit & Lennard, Linda. (2004). *Health literacy: being able to make the most of health*.

Nutbeam, D., (2000). *Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century.* Health Promot Int., 15 (3),259–267.

# FRI-2G.309-2-MCDA-01

# GIANT ANEURYSM OF RIGHT COMMON FEMORAL ARTERY

# Atanas Stavrov, MD

UMHAT Medica Ruse, Bulgaria Vascular surgery clinic Tel.: +359 886544149 E-mail: stavrov\_med@abv.bg

**Hristo Georgiev, MD** UMHAT Medica Ruse, Bulgaria Vascular surgery clinic Phone: +359 887096814

Assoc. Prof. Kiril Panayotov, PhD Department of Medical and clinical diagnostics, University of Ruse "Angel Kanchev" Tel.: +359888309621 E-mail: zkm4@abv.bg

**Abstract:** True arterial aneurysms are defined as a 50% increase in the normal diameter of the vessel. Clinical symptoms usually arise from the common complications that affect arterial aneurysms—namely, rupture, thrombosis, or distal embolisation. Although the aneurysmal process may affect any large or medium sized artery, the most commonly affected vessels are the aorta and iliac arteries, followed by the popliteal, femoral, and carotid vessels. Although abdominal aneurysms may cause symptoms because of pressure on surrounding structures, about three quarters remain asymptomatic at initial diagnosis. with the exception of vague abdominal pain, clinical symptoms usually result from embolisation or rupture of the aneurysm. We present a case of giant right AFC aneurysm in a 66 years old male after patch plastic AFC, AFS and APF 3 years ago. He takes anticoagulant therapy prescribed after operation. Now the patient presented with mild right leg pain at inguinal region from 10 days, oedema, hyperemia and pulsatile mass. Methods of diagnosis: on palpation: pulsatile mass in right inguinal region; CT-angiography show: heterodensity structure 75/92mm axial/coronal size.; Catheter angiography show: ruptured aneurysmal dilatated right common femoral artery. We tought decision for surgical treatment.

Keywords: Arteria, Aneurysm, Mortality, Treatment

# REFERENCES

Scott, RAP., Wilson, NM., Ashton, HA., Kay, DM. (1995). Influence of screening on the incidence of ruptured abdominal aortic aneurysm: 5-year results of a randomised controlled study. Br J Surg ; 82:1066-70.

Thompson, MM., Sayers, RD. (1998). Arterial aneurysms. In: Beard JD, Gaines P, eds. Companion to specialist surgical practice. Vol VII. Arterial surgery. London: W B Saunders.

UK Small Aneurysm Trial Participants. (1998). Mortality results for randomised controlled trial of early elective surgery or ultrasonographic surveillance for small abdominal aortic aneurysms. Lancet; 352:1649-55.

# GIANT CYSTIC TERATOMA OF THE MESORECTUM IN A MALE PATIENT. CASE REPORT

# Tsanko Yotsov, MD

Department of nursing care, University of Ruse "Angel Kanchev", Ruse, Bulgaria Tel.: +359 897695209 E-mail: tsankoyotsov@gmail.com

**Ivelin Yotsov, MD** UMHAT Medica Ruse, Bulgaria Tel.: +359 896717671 E-mail: yotsov01@abv.bg

#### Assoc. Prof. Kiril Panayotov, PhD

Department of Medical and clinical diagnostics, University of Ruse "Angel Kanchev" Tel.: +359888309621 E-mail: zkm4@abv.bg

Abstract: Mature cystic teratoma (MCT) or dermoid cyst is a benign tumor originating from germ cells. Usually it arises from the ovary, but it can occure in males too, most often in the testis. In males oelvis teratomas are extremely rare. They usually present with symptoms related to mass effect in the pelvis.

We present a case of giant MCT in a 52 years old patient. The patient presented with mild lower abdominal pain and chronic constipation. On rectal digital examination a large, soft tumor mass can palpated that is not inside the rectal lumen. CT and MRI show a large cystic tumor in the mesorectum with compression of the rectum and deformity of the pelvic walls. Open surgical enucleation was performed. a drain was left in place of the tumor in the mesorectum. Postoperative period was uneventful. Liquid diet was advanced on postoperative day 1. The drain was removed on postoperative day 3. Patient was discharged on postoperative day 5. Histology turned mature cystic teratoma as diagnosis. At 6 months postoperatively patient has no complications.

Giant MCT are unusually located in male pelvis, but few cases can occure. Surgical enucleation was feasible and safe in our case and there were no complications related ot continence.

Keywords: Giant mature cystic teratoma, Mesorectum, Teratoma JEL Codes: L10, L11

#### REFERENCES

Alhumayed, M., Liau, J. (2021). *Extensive mature cystic teratoma in the pelvis of an adult male patient mimicking a prostatic abscess. Radiol Case Rep.* Apr 9;16(6):1343-1347. doi: 10.1016/j.radcr.2021.03.011. PMID: 33897926; PMCID: PMC8055521.

Erden, A., Ustuner, E., Erden, I., Kuzu, MA., Heper, AO. (2003). *Retrorectal dermoid cyst in a male adult: case report*. Abdom Imaging. Sep-Oct;28(5):725-7. doi: 10.1007/s00261-002-0093-4. PMID: 14628885.

Gatcombe, HG., Assikis, V., Kooby, D., Johnstone, PA. (2004). *Primary retroperitoneal teratomas: a review of the literature*. J Surg Oncol. May 1;86(2):107-13. doi: 10.1002/jso.20043. PMID: 15112254.

Rajiah, P., Sinha, R., Cuevas, C., Dubinsky, TJ., Bush, WH. Jr., Kolokythas, O. (2011). Imaging of uncommon retroperitoneal masses. Radiographics. Jul-Aug;31(4):949-76. doi: 10.1148/rg.314095132. PMID: 21768233.

# CHALLENGES IN DIAGNOSING IDIOPATHIC PULMONARY FIBROSIS

#### Assoc. Prof. Dora Marinova, PhD

Department of Health Care, University of Ruse "Angel Kanchev" University Hospital Medika Tel.: +359888027907 E-mail: dmusic@abv.bg

**Abstract:** Idiopathic pulmonary fibrosis (IPF) is part of the group of interstitial lung diseases and is a rare chronic progressive fibrosing interstitial pneumonia with unknown etiology which develops in adults. It is the most common and the deadliest. The purpose of this review is to draw attention to the process of diagnosing IPF by showing the importance of early diagnosis for treatment and therefore for improved survival of patients.

Keywords: Idiopathic pulmonary fibrosis, Diagnosis JEL Codes: L10, L11

## REFERENCES

Raghu, G., Remy-Jardin, M., Mayers, J.L, et al. (2018). *Diagnosis of idiopathic pulmonary fibrosis: an officiale ats/ers/jrs/alat Clinical Practice Guideline*. AJRCCM; 198(5):44-68.

# NEWBORN UMBILICAL CORD CARE

#### Tatyana Itova, MD

Department of Public health, University of Ruse "Angel Kanchev" Phone: +359 884 419 131 E-mail: titova@uni-ruse.bg

Abstract: Cutting the umbilical cord, treating the umbilica remnant after birth until it falls off, and the umbilical wound after that are part of the routine care given to newborns. The aim of the present study was to investigate the care taken in handling the umbilical remnant and umbilical wound in the neonatal period. Material and methods: The study was conducted in June-July 2022 in the Republic of Bulgaria. The participants are neonatologists from 28 leading neonatology units in our country. Through a voluntary survey containing prepared open-ended questions, the necessary information was collected. Results and discussion: The usual practice is for the midwife receiving the newborn to clamp and cut the umbilical cord. The clamping of the umbilical cord is most often done towards the end of the first minute. Very rarely do parents discuss delayed clamping before birth. When performing this manipulation, the rules of sterility are observed by the service personnel. Most often, 70% ethanol is used as a disinfectant. In the daily care of the umbilical cord, some centers also use a drying cream/spray. Due to the early discharge of the newborns, a very small proportion of them don't have umbilical remnant when leaving the neonatal unit. Usually, the umbilical cord is separated between the 5th and 10th postnatal days. One of the main problems that are discussed with parents before leaving the neonatology department is the care for the umbilical remnant after discharge. Conclusion: The umbilical remnant care residue in newborns is unified for most neonatology centers in the Republic of Bulgaria. It is necessary to build a unified national algorithm for this, as part of routine care for newborns.

Keywords: Newborn, Umbilical cord JEL Codes: L10, L11

#### REFERENCES

Chiruvolu, A., Mallett, L. H., Govande, V. P., Raju, V. N., Hammonds, K., & Katheria, A. C. (2022). *Variations in umbilical cord clamping practices in the United States: a national survey of neonatologists*. The Journal of Maternal-Fetal & Neonatal Medicine, 35(19), 3646-3652.

Coffey, P. S., & Brown, S. C. (2017). Umbilical cord-care practices in low-and middleincome countries: a systematic review. BMC pregnancy and childbirth, 17(1), 1-21.

Guen, G. L., Caille, A., Launay, E., Boscher, C., Godon, N., Savagner, C., ... & Giraudeau, B. (2017). *Dry care versus antiseptics for umbilical cord care: a Cluster Randomized Trial*. Pediatrics, 139(1).

McConnell, T. P., Lee, C. W., Couillard, M., & Sherrill, W. W. (2004). *Trends in umbilical cord care: scientific evidence for practice*. Newborn and infant nursing reviews, 4(4), 211-222.

Moslemi, L., Zafari, M., & Aghamohammadi, A. (2015). *Comparing the effect of topical application of human milk and dry cord care on umbilical cord separation time in healthy newborn infants*. Iranian journal of pediatrics, 22(2), 158-162.

Quattrin, R., Iacobucci, K., De Tina, A. L., Gallina, L., Pittini, C., & Brusaferro, S. (2016). 70% alcohol versus dry cord care in the umbilical cord care: a case-control study in Italy. Medicine, 95(14).

Smith, C., K. (2009). *Some traditional umbilical cord care practices in developing countries*. Midwifery today with international midwife, (91), 12-13.

Stewart, D., Benitz, W., Watterberg, K. L., Cummings, J. J., Eichenwald, E. C., Poindexter, B. B., ... & Wang, K. S. (2016). *Umbilical cord care in the newborn infant*. Pediatrics, 138(3).

# INTRACORONARY ELECTROCARDIOGRAM-GUIDED STRATEGY FOR THE TREATMENT OF CORONARY BIFURCATION LESIONS – EFFECT ON MORTALITY

#### Dr Niya Mileva, MD

SBALK "Medica Cor", Ruse, Bulgaria Tel.: +359897983936 E-mail: nmileva91@gmail.com

**Dr. Panayot Panayotov, MD** SBALK "Medica Cor", Ruse, Bulgaria Tel.: +359887940661 E-mail: vlak\_2000@mail.ru

## Prof. Dobrin Vassilev, MD, PhD

SBALK "Medica Cor", Ruse, Bulgaria; Department of Health Care, "Angel Kanchev" University of Ruse, Bulgaria Phone: +359886846550 E-mail: dobrinv@gmail.com

**Abstract:** Revascularization of bifurcation lesions remains an interventional challenge. The current study aimed to evaluate the influence of intracoronary ECG-guided revascularization strategy on the clinical outcomes of patients after coronary bifurcation stenting compared to the currently accepted standard of care. Patients with coronary bifurcation lesions who underwent percutaneous revascularization were enrolled in a prospective all-comers' registry, and a comparison between patients who underwent intracoronary ECG-guided revascularization and those treated with a provisional T-stenting strategy was made. a total of 768 were included in the analysis - 349 patients underwent icECG-guided strategy and 419 - PTS. The overall all-cause death was 23.2% and cardiovascular death was 15.9%. Patients with icECG guidance had significantly lower all-cause and cardiovascular mortality – icECG vs PTS: all-cause mortality – 20.3% vs. 25.5%, log-rank p=0.006; cardiovascular mortality – 12.6% vs. 18.6%, log-rank p=0.004. The effect of decreased mortality was most pronounced in patients with no or moderate increase of troponin post-PCI as well as those with higher-than-normal baseline concentrations. Intracoronary ECG-guided strategy for coronary bifurcation PCI led to a decreased patient mortality when compared to the provisional T-stenting strategy. This effect was most pronounced in patients with no or moderate increase of troponin post-PCI as well as in those with higher-than-normal baseline concentrations.

Keywords: Coronary bifurcation, Percutaneous coronary intervention, Clinical outcomes JEL Codes: L10, L11

#### REFERENCES

Chevalier, B., Mamas, MA., Hovasse, T. et al. (2021). *Clinical outcomes of the proximal optimisation technique (POT) in bifurcation stenting. EuroIntervention:* journal of EuroPCR in collaboration with the Working Group on Interventional Cardiology of the European Society of Cardiology;17: e910-e918.).

Grundeken, MJ., Wykrzykowska, JJ., Ishibashi, Y. et al. (2016). *First generation versus second generation drug-eluting stents for the treatment of bifurcations*: 5-year follow-up of the LEADERS all-comers randomized trial. 2016; 87: E248-E260.

Hakim, D., Chatterjee, A., Alli, O. et al. (2017). *Role of Proximal Optimization Technique Guided by Intravascular Ultrasound on Stent Expansion, Stent Symmetry Index, and Side-Branch Hemodynamics in Patients with Coronary Bifurcation Lesions.* Circ Cardiovasc Interv;10.

Lee, DH., de la Torre Hernandez, JM. (2018). The Newest Generation of Drug-eluting Stents and Beyond. European cardiology; 13: 54-59.

Räber, L., Magro, M., Stefanini, GG. et al. (2012). Very late coronary stent thrombosis of a newer-generation everolimus-eluting stent compared with early-generation drug-eluting stents: a prospective cohort study. Circulation; 125:1110-21.

# COMPOSITE GRAFT IN SUBTOTAL TRAUMATIC AVULSION OF THE AURICLE - CASE REPORT

#### Petar Bonev, MD

Department of plastic, reconstructive and aesthetic surgery UMBAL "Medica - Ruse" Ltd Phone: +359884136864 E-mail: petar.b.bonev@gmail.com

#### Assoc. Prof. Kiril Panayotov, PhD

Department of Medical and clinical diagnostics, University of Ruse "Angel Kanchev" Tel.: +359888309621 E-mail: zkm4@abv.bg

**Abstract:** The aesthetic result after post-traumatic reconstruction in the area of the head and face should not be underestimated. The loss of a whole body part after trauma is leading to serious disability, poor quality of life and low self-esteem, especially in young people.

We present a case of subtotal avulsion of the ear in young man. The patient is administered in emergency department 2 hours after the trauma. During the examination we identified multiple bruises temporally and parietally on the head, subtotal avulsion of the auricle with lobular skin pedicle, multi-fragment trauma of the cartilage, haemorrhage from the upper pole of the lesion and contamination. We performed an emergency surgery. In lateral decubitus position, under local anesthesia, multiple lavage with antiseptics and removal of the foreign bodies was done. Repositioning and fixation of the cartilage fragments. Suturing the skin with a running suture. Specific sterile bandage for fixation of the reconstructed auricle. Postoperative antibiotics and prevention of the venous congestion therapy was administered. Sutures were removed on 10th postoperative day. One month after the surgery there are no complications and the patient is satisfied with the aesthetic result.

In cases of subtotal avulsion of the auricle, in emergency conditions and lack of possibility for microsurgery, reconstruction of the auricle with composite graft is the recommended procedure in the literature. If successful and without complications, we can expect really good aesthetic result.

*Keywords:* Reconstruction, surgery, Auricular avulsion, Composite graft, Emergency *JEL Codes:* L10, L11

#### REFERENCES

Andrew, D., Gailey, MS., corresponding author Douglas, Farquhar, Joseph, Madison, Clark, William, W., Shockley. (2020). *Auricular avulsion injuries and reattachment techniques: a systematic review*. Laryngoscope Investig Otolaryngol. Jun; 5(3): 381–389.

Nicolay, NH., Bruno, AD., Follmar, KE., et al. (2007). *Near-total ear amputation: anatomical bases and management*. Chirurg; 78: 835–839.

Ozçelik, D., Unveren, T., Toplu, G. (2009). Subtotal ear amputation with a very narrow pedicle: a case report and review of the literature. Ulus Travma Acil Cerrahi Derg;15: 306–310.

Steffen, A., Katzbach, R., Klaiber, S. (2006). a comparison of ear reattachment methods: a review of 25 years since pennington. Plast Reconstr Surg; 118:1358-1364.

# FOOD ADDITIVES-ALTERNATIVE APPROACH IN MONOTHERAPY AND ADJUVANT TREATMENT OF SOCIALLY SIGNIFICANT DISEASES

# Rositsa Krasteva, MD

Department of Health Care, University of Ruse, Bulgaria Phone: +359 888 682 798 e-mail: rosikrasteva@abv.bg

**Abstract:** Plants and the biologically active substances contained in them are a new alternative for treatment of socially significant diseases in the form of monotherapy or as an adjuvant treatment to the main medications.

In ancient times the healing properties of plant extracts and a number of unlimited compounds were well known emperically, but with the advancement of medicine and pharmacotherapy they have been left behind.

Today the pharmaceutical industry is once again showing great interest in phytopreparations and natural products because of their properties. In this article are reported the pharmacoeffects of some widely distributed plant extracts and natural substances like lemon balm(Mellisa officinalis), piperine and Magnesium in the treatment of socially significant diseases such as anxiety, depression and other dysfunctional conditions of the central nervous system and of Monakolin K, Choline and Hydroxytyrozol in the conrtol of dyslipidaemia and hypercholesterolaemia, a major risk factor for vascular diseases

*Keywords: Plants extracts, Food additives, Treatment alternative JEL Codes: L10, L11* 

# REFERENCES

Awad, R. et al. (2009). *Bioassay-guided fractionation of lemon balm (Melissa officinalis L.)* using an in vitro measure of GABA transaminase activity, Phytotherapy Research 22 Jan.

Bruno, A. et al. (2018). *Red Yeast Rice (RYR) supplementation in patients treated with second-generation antipsychotics*. Complementary Therapies in Medicine, Volume 37, April, p. 167-171.

Dastmalchi,K. Et al.,Acetylcholinesterase inhibitory guided fractionation of *Melissa* officinalis L. Bioorganic & Medicinal Chemistry Volume 17, Issue 2, 15 January 2009, Pages 867-871.

Markovic, AK. et al. (2019). *Hydroxytyrosol, Tyrosol and Derivatives and their Potential Effects on Human Health.* Molecules. May; 24(10): 2001.

Serfko, A. et al. (2013). *Magnesium in depression*. Pharmacological Reports, Vol.65, Issue 3, May-June, p.547-554.

# CONTEMPORARY ASPECTS IN THE APPROACH TO THE TREATMENT OF NON-HEALING WOUNDS

#### **Teacher Vanya Dacheva**

Department Medical and Clinical Diagnostic Activities Faculty of Public Health and Health Care University of Ruse "Angel Kanchev" Phone: +359 889 729 270 E-mail: vdacheva@uni-ruse.bg

**Abstract:** In recent years, there is a high frequency in chronic wounds with a tendency for it to increase even further, whilst the challenges for their successful treatment are complex. The most recent causes for them vary from diseases such as diabetes, vascular diseases, tumours of the skin and subcutaneous tissue, posttraumatic complications, radiation, or complications due to bedsores. It is very important that a consensus is reached in relation to the treatment of chronic wounds. It should be based on knowledge and experience, in conjunction with scientific evidence. This could improve the health of a lot of patients, and would create an economic advantage for a lot of hospitals and health care facilities.

Keywords: Chronic wounds, Chronic wound healing, Consensus approach, Multimodal treatment, Improvement of current practices

JEL Codes: L10, L11

#### REFERENCES

Atkin, L., & Bućko, Z., Conde Montero, E. et al. (2019). *Implementing TIMERS: the race against hard-to-heal wounds*. J Wound Care.; 23(Sup3a): S1-S50.

Falanga, V. (2005). Wound healing and its impairment in the diabetic foot. Lancet; 366(9498): 1736-1743.

Hajhosseini, B., & Kuehlmann, BA. et al. (2020). *Hyperbaric oxygen therapy: descriptive review of the technology and current application in chronic wounds*. Plast Reconstr SurgeryGlob Open.; 8(9): e3136.

Percival, SL., & Suleman, L. (2015). Slough and biofilm: removal of barriers to wound healing by desloughing. ;24(11):498, 500–503,506–510- 510.

Rogers, LC., & Armstrong, DG., (2020). Wound center without walls: the new model of providing care during the COVID-19 pandemic. Wounds a Compend Clin Res Pract.; 32(7): 178-185.

Sheehan, P., & Jones, P. (2003). *Percent change in wound area of diabetic foot ulcers over a 4-week period is a robust predictor of complete healing in a 12-week prospective trial.* Diabetes Care; 26(6): 1879-1882.

Snyder, D., & Sullivan, N., & Margolis, D., et al. (2020). *Skin Substitutes for Treating Chronic Wounds [Internet]*. Agency for Healthcare Research and Quality (US);

Tapking, C., & Boson, AL., & Rontoyanni, VG., et al. (2020). a systematic review and metaanalysis of 30-day readmission rates following burns. Burns; 46(5): 1013-1020.

Xia, N.; Morteza, A., & Yang, F., & Cao, H.& Wang, A. (2019). *Review of the role of cigarette smoking in diabetic foot.* J Diabetes Investig, 10(2): 202-215.

URL:

https://onlinelibrary.wiley.com/doi/epdf/10.1111/wrr.12994 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5350204/#CR7

# FRI-2G.104-1-HC

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

# EVIDENCE-BASED NURSING PRACTICE IN THE CONTEXT OF HEALTHCARE QUALITY AND PATIENT SAFETY

#### Assoc. Prof. Despina Georgieva, PhD Department of Health Care University of Ruse "Angel Kanchev", Bulgaria E-mail: dpgeorgieva@uni-ruse.bg

Abstract: Many European and international organizations are involved in the problems of the quality of nursing care and patient safety. In recent years, the issue of patient safety has been recognized as a key element of total quality. Despite the many programs adopted to improve quality and safety, WHO reports a significant number of deaths. In the United States and developed European countries, the nursing process, validated nursing documentation, and evidence-based nursing practice have been applied to improve the quality of health care for more than 30 years. Against the background of the personnel crisis in Bulgaria, the lack of national standards for good nursing practice, the lack of nursing documentation and a nursing process implemented in practice, the quality of health care, as well as the safety of patients, is significantly threatened. As a full member of the European Union, Bulgaria needs to synchronize the requirements for the health care system and health care with the European normative documents concerning the quality of health care and patient safety. The nursing process, as well as evidence-based practice, are science-based activities, and their implementation affirms the importance and autonomy of the nursing profession.

*Keywords:* Evidence-based nursing practice, Standards, Nursing documentation, Quality, Safety. *JEL Codes: 1, 128* 

#### REFERENCES

Chaneva, G. (2008). The quality of nursing care as a priority, Sofia, 2088, ISBN 978-954-9365-22-1 (**Оригинално заглавие**: Чанева, Г. (2008). Качеството на сестринските грижи като приоритет, София, 2088, ISBN 978-954-9365-22-1)

Hughes RG. (2008). Editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008 Apr. PMID: 21328752.

Luxembourg. (2005). Patient Safety – Making it Happen! Luxembourg April, 2005 Declaration on Patient Safety URL: http://www.efnweb.be/wpcontent/uploads/2011/11/LuxembourgDeclarationFinal.pdf (Accessed on 09.10.2022).

National Quality Forum.(2006). Standardizing a patient safety taxonomy: a consensus report. Washington, DC: National Quality Forum; 2006. URL: https://psnet.ahrq.gov/issue/standardizing-patient-safety-taxonomy (Accessed on 03.10.2022).

Nightingale F.(1987). I have done my duty. In: Goldie SM, editor. Florence Nightingale in the Crimean War, 1854–56. Manchester: Manchester University Press; 1987.

Olfat s. A., A. Alamrani., & B.S., Malbloushi, (2009) Knowledge, Practice and Attitude of Evidence Based Practice AmongNurses in Kingdom of Saudi Arabia Cairo Univ., Vol. 77, No. 2, September: 121-128, 2009, URL: www.medicaljournalofcairouniversity.com/(Accessed on 05.10.2022).

Р. Marinova. (2001). The modern nurse, sociological, educational and managerial aspects, S. Nov, day, 2001. (*Оригинално заглавие*: П. Маринова Съвременната медицинска сестра, социологически, образователни и управленски аспекти, С. Нов, ден, 2001г.)

Rinspun D., Virani T. Bajnok F.(2001): Nursingbest practice guidelines the RNAO project. Hospital Quarterly, 2000: 54-58, 2001Med. J.

S. Borisova. (2017). Standards of health care - a priority of modern nursing, First National Conference "Public health - a global priority in science and practice". Varna: 2017. p. ISBN: 978-619-221-087-8 (**Оригинално заглавие**: С. Борисова. (2017). Стандарти по здравни грижи - приоритет на съвременното сестринство, Първа национална конференция "Общественото здраве – глобален приоритет в науката и практиката". Варна: 2017. р. ISBN: 978-619-221-087-8)

Tourangeau AE, Cranley LA & Jeffs L. (2006) Impact of nursing on hospital patient mortality: a focused review and related policy implications. Qual Saf Health Care. 2006 Feb;15(1):4–8. [PMC free article] [PubMed]

USAHS. (2020). UNIVESITY of ST.AUGUSTINE FOR HEALTH SCIENCES, The Role of Evidence-Based Practice in Nursing, Blog home > Nursing MSN & DNP > The Role of Evidence, August 2020, URL:https://www.usa.edu/blog/evidence-based-practice/(Accessed on 07.10.2022).

Wandelt MA. (1976). Definitions of words germane to evaluation of health care. NLN Publ. 1976;(15-1611):57–8.

WHO. (2022). Quality of care, URL: https://www.who.int/health-topics/quality-of-care#tab=tab\_1, (Accessed on 01.10.2022).

World Health Organization.(2008). ASSURING THE QUALITY OF HEALTH CARE IN THE EUROPEAN UNION, , on behalf of the European Observatory on Health Systems and Policies, ISBN 978 92 890 7193 2 Printed in the United Kingdom by MPG Books Ltd, Bodmin, Cornwall URL: https://www.euro.who.int/\_\_data/assets/pdf\_file/0007/98233/E91397.pdf (Accessed on 20.09.2022)

Zanetti ACB, Dias BM, Bernardes A, Capucho HC, Balsanelli AP, Moura AA, Soato R, Gabriel CS. (2021). Incidence and preventability of adverse events in adult patients admitted to a Brazilian teaching hospital. PLoS One. 2021 Apr 15;16(4):e0249531. doi: 10.1371/journal.pone.0249531. PMID: 33857137; PMCID: PMC8049336.
# MIDWIFERY DOCUMENTATION – CHALLENGES AND NEW HORIZONS BEFORE AUTONOMOUS MIDWIFERY PRACTICE IN BULGARIA

## Prof. Ivanichka Serbezova, PhD

Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: iserbezova@uni-ruse.bg

#### Assist. Daniela Lyutakova

Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: dlyutakova@uni-ruse.bg

**Abstract:** Good record keeping is integral to midwifery practice and it has always been a key component of safe, effective and individualized care provision. This article explores the challenges and possibilities of implementing specialized midwife documentation as an integration tool for autonomous midwife practices in Bulgaria. The current professional framework that governs independent midwifery practice on a national level is reviewed and authors discuss available charting tools. Challenges regarding specialists` attitudes towards record keeping are explored and the importance of proper documentation is explained in the context of autonomous practice integration. An originally developed form for prenatal consultation is suggested.

*Keywords:* Record Keeping in Midwifery, Midwifery Documentation, Autonomous Midwife, Midwife Led Care, Midwife Documentation, Private Practice Midwife, Patient Centered Care

JEL Codes: 110

## REFERENCES

ВАНРN, National Quality Council, (2020), Methodology for the Activities of Autonomous Nurses, Midwives, Rehabilitators and Paramedics/Physician Assistants (PROJECT). (*Оригинално заглавие:* Българска асоциация на професионалистите по здравни грижи (БАПЗГ), Национален съвет по качество (НСК), (2020), Методика за дейността на свободно практикуващи медицински сестри, акушерки, рехабилитатори и фелдшери/лекарски асистенти (ПРОЕКТ))

Bulgarian Medical-Treatment Facilities Act - (*Оригинално заглавие:* Закон за лечебните заведения)

Cooper, Alannah L. et al., (2021), Is nursing and midwifery clinical documentation a burden? An empirical study of perception versus reality, Wiley Online Library, JCN, Volume30, Issue11-12, June 2021, Pages 1645-1652

Hristova, Ts., (2021), Special Midwife Care for Low-Risk Pregnancies. a Guide for Student Midwives, Mediateh-Pleven (*Оригинално заглавие: Христова, Цв., 2021. Сепциални акушерски грижи при нормална бременност. Плевен: Издателство "Медиатех-Плевен".*)

Kerkin, B., Lennox, S., Patterson, J., (2018), Making midwifery work visible: The multiple purposes of documentation, Women Birth, 2018 Jun;31(3):232-239. doi: 10.1016/j.wombi.2017.09.012. Epub 2017 Sep 27. PMID: 28958764.

Law, L., Akroyd, K., Burke, L., (2013), Improving nurse documentation and record keeping in stoma care. Br J Nurs. 2010 Nov 25-Dec 8;19(21):1328-32. doi: 10.12968/bjon.2010.19.21.80002. PMID: 21355356. Murphy, F., Doody, O., Lyons, R., (2019), Guidance framework to aid in the selection of nursing and midwifery care process metrics and indicators. Nursing Open, Published online 2019 Apr 16. doi: 10.1002/nop2.273

Nursing and Midwifery Board of Ireland, (2002, rev. 2005), Recording Clinical Practice Guidance to Nurses and Midwives (First Edition).

Potera, C., (2013), Evidence Supports Midwife-Led Care Models. AJN, American Journal of Nursing: November 2013 - Volume 113 - Issue 11 - p 15 doi: 10.1097/01.NAJ.0000437097.53361.dd

REGULATION No. 1 of 02/08/2011 for the professional activities that nurses, midwives, associate medical specialists and health assistants may perform by appointment or independently. Issued by the Minister of Health, published, Official State Gazette, no. 15 of 18.02.2011, amended and supplemented, no. 50 from 1.07.2011 (*Оригинално заглавие: НАРЕДБА No 1 OT 8 ФЕВРУАРИ 2011 Г. ЗА ПРОФЕСИОНАЛНИТЕ ДЕЙНОСТИ, КОИТО МЕДИЦИНСКИТЕ СЕСТРИ, АКУШЕРКИТЕ, АСОЦИИРАНИТЕ МЕДИЦИНСКИ СПЕЦИАЛИСТИ И ЗДРАВНИТЕ АСИСТЕНТИ МОГАТ ДА ИЗВЪРШВАТ ПО НАЗНАЧЕНИЕ ИЛИ САМОСТОЯТЕЛНО, Издадена от Министерството на здравеопазването.)* 

Renfrew, MJ, McFadden, A., Bastos, MH, et al., (2014), Midwifery and quality care: findings from a new evidence-informed framework for maternal and newborn care, The Lancet, DOI:https://doi.org/10.1016/S0140-6736(14)60789-3

Serbezova, I., (2014), Special Midwife Care for Pregnant Women, Women in Labour, Postpartum Women and Newborns, Ruse (**Оригинално заглавие:** Сербезова, И., 2014. Специални грижи за бременни, раждащи, родилки и новородени. Русе.)

The Northern Ireland Practice and Education Council for Nursing and Midwifery, (2016), Standards for person centred nursing and midwifery record keeping practice

The NSW Nurses' Association, (2021), Guidelines on Documentation and Electronic Documentation, Re-endorsed by Annual Conference 2021

The Royal College of Midwives, (2021), Electronic Record Keeping Guidance and Audit Tool

Walker DS, Visger JM, Levi A. (2008) Midwifery data collection: options and opportunities. J Midwifery Womens Health. 2008 Sep-Oct;53(5):421-9. doi: 10.1016/j.jmwh.2008.04.002. PMID: 18761295. - https://pubmed.ncbi.nlm.nih.gov/18761295/

WHO, (2009), EU Standards for midwifery practice

## CONFLICT MANAGEMENT METHODS IN HEALTH CARE

#### Assoc. Prof. Tsveta Hristova, PhD

Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: : tshristova@uni-ruse.bg

#### Chief Assist. Yoana Lukanova, PhD

Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: ylukanova@uni-ruse.bg

**Abstract:** Conflict management for Health care specialists is defined as an important factor in maintaining a positive work environment which increases quality and patient safety. It is realized by means of prevention and regulation of the development of conflict situations process with the purpose of minimizing their destructive influence.

In the report are presented results of a self-study among students of the Master's program in Healthcare Management, Department of Health Care, "Angel Kanchev" University of Rousse of the factors for the conflicts in the Health care. In this report practical applicable strategies and methods are considered that predict, prevent, and manage the conflict at the health care specialists.

After analysis, conclusions are drawn: the effective communication is a form of conflict management in the health care; the head and senior nurse/midwife have a significant role in creating a favorable working environment without interpersonal conflicts; building a good team is of vital importance for the conflict management and for the quality of the health care provided; the study of conflicts enhances the ability to timely detection and handling of conflict factors, improves the organizational skills for the formation of a good, professional microclimate, without stress, with a desire for continuing education.

Keywords: conflict, management, health care, methods and approaches JEL Codes: 123

## REFERENCES

Georgiev, N., (2019). Sources of conflict in healthcare, XLIV PROCEEDINGS "CONTAKT 2019", Tempo, Sofia, P. 52-56 (*Оригинално заглавие*: Георгиев, Н. 2019.Източници на конфликтни ситуации в здравеопазването, XLIV Научно-технологична сесия "Контакт 2019", изд. Темпо, София, стр. 52-56)

Georgieva, D., I. Hristova (2021). Crisis in the healthcare system related to the lack of nurses in the republic of Bulgaria, PROCEEDINGS OF UNIVERSITY OF RUSE - 2021, vol. 60, book 8.2., pp. 33-41 (**Оригинално заглавие**: Георгиева, Д., И. Христова 2021. Криза в здравеопазването, свързана с недостига на медицински сестри в Р България, Научна конференция, Русенски университет, том 60 (8.2), стр. 33-41)

Gerardi, D. (2015). Conflict engagement: a new model for nurses. AJN The American Journal of Nursing, 115(3), 56-61.

Johansen, M. L., & Cadmus, E. (2016). Conflict management style, supportive work environments and the experience of work stress in emergency nurses. Journal of Nursing Management, 24(2), 211-218.

Lahana, E., Tsaras, K., Kalaitzidou, A., Galanis, P., Kaitelidou, D., & Sarafis, P. (2019). Conflicts management in public sector nursing. International Journal of Healthcare Management, 12(1), 33-39.

Raykova, E., M. Semerjieva (2009). Conflicts in Health Organization, Management and Education, Vol. 5 (1), р 189-193 (*Оригинално заглавие: Райкова, Е., М. Семержиева 2009.* Конфликтите в здравната организация, Управление и образование, том 5 (1), стр. 189-193)

Raykova, E., M. Semerjieva (2019). Methods for managing organizational conflicts in hospital, KNOWLEDGE – International Journal, Vol. 34.1, p. 99-105 (*Оригинално заглавие:* Райкова, Е., М. Семержиева 2019, Методи за управление на организационни конфликти в болницата, KNOWLEDGE – International Journal, том 34.1, стр. 99-105)

Serbezova, I. (2018). CONFLICTS IN STUDENTS GROUPS AND THEIR MANAGEMNT, PROCEEDINGS OF UNIVERSITY OF RUSE - 2018, vol. 60, book 8.2., pp. 16-22 (*Оригинално* заглавие: Сербезова, И. 2018. Конфликтите в студентския колектив и техният мениджмънт, Научна конференция, Русенски университет Ангел Кънчев, том 57 (8.2), стр. 16-22)

Stambolova, I. (2021). Studi of the dynamics of conflicts in health care, Management and Education, Vol. 17 (5), р 74-78 (*Оригинално заглавие: Стамболова, И., 2021. Проучване на динамиката на конфликтите в здравните грижи, Управление и образование, том 17 (5), стр. 74-78*)

## HOSPITAL ANXIETY IN INVASIVE CARDIOLOGY

#### Assoc. Prof. Irinka Hristova, PhD

Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: ihristova@uni-ruse.bg

## Assoc. Prof. Greta Koleva, PhD

Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: gkoleva@uni-ruse.bg

**Abstract:** The identification and management of hospital anxiety and depression are an essential part of the care of patients with cardiovascular disease. That is why the report aims to present the importance of hospital anxiety and to determine its prevalence in patients hospitalized in an invasive cardiology unit. Methods. The study included 128 patients hospitalized for elective coronary angiography. They were assessed on the hospital anxiety subscale - HADS-A before and after viewing a video film about the nature of coronary angiography, preprocedural preparation and postprocedural health care. Results. The reported changes in the results of HADS-A are in the direction of reducing the patients' anxiety, which proves that the applied intervention leads to a decrease in the level of anxiety. Conclusion. The first step to overcoming hospital anxiety is to inform and expand the knowledge of the patient. When the patient receives adequate information, presented in a way that is comprehensible to him, anxiety has less chance to prevail.

*Keywords:* HANDS, Hospital Anxiety, Invasive Cardiology, Cardiovascular Disease *JEL Codes:* 110, 119

## REFERENCES

Assari, S., Zandi, H., Ahmadi, K., & Kazemi Saleh, D. (2017). Extent of Coronary Stenosis and Anxiety Symptoms among Patients Undergoing Coronary Angiography. The journal of Tehran Heart Center, 12(4), 155–159.

Berge, T., Bull-Hansen, B., Solberg, E. E., Heyerdahl, E. R., Jørgensen, K. N., Vinge, L. E., Aarønæs, M., Øie, E., & Hyldmo, I. (2019). Screening for symptoms of depression and anxiety in a cardiology department. Journal of the Norwegian Medical Association: journal for practical medicine, new series, 139(14), 10.4045/tidsskr.18.0570.

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale. An updated literature review. Journal of psychosomatic research, 52(2), 69–77.

Cerit, L., Cerit, Z., & Duygu, H. (2022). The non-negligible association between SYNTAX score and anxiety-depressive disorders. Cardiovascular journal of Africa, 33, 1–5. Advance online publication.

Das, D. R., Nayak, M. R., Mohapatra, D., & Mahanta, D. (2022). Association of Anxiety and Depression in Patients Undergoing Cardiac Catheterization with Number of Major Coronary Artery Stenosis: a Cross-Sectional Study. Cureus, 14(1), e21630.

Herrmann, C. (1997). International experiences with the Hospital Anxiety and Depression Scale--a review of validation data and clinical results. Journal of psychosomatic research, 42(1), 17–41.

Jamshidi, N., Abbaszadeh, A., Kalyani, M. N., & Sharif, F. (2013). Effectiveness of video information on coronary angiography patients' outcomes. Collegian (Royal College of Nursing, Australia), 20(3), 153–159.

Lattuca, B., Barber-Chamoux, N., Alos, B., Sfaxi, A., Mulliez, A., Miton, N., et al. (2018). Impact of video on the understanding and satisfaction of patients receiving informed consent before elective inpatient coronary angiography: a randomized trial. American heart journal, 200, 67–74.

McManus S Meltzer H Brugha T Bebbington P Jenkins R , eds Adult Psychiatric Morbidity in England 2007. Results of Household Survey. URL: http://www.hscic.gov.uk/catalogue/PUB02931/adul-psyc-morb-res-hou-sur-eng-2007-rep.pdf (Accessed on 25.08.2022).

Yap, J., Teo, T. Y., Foong, P., Binte Hussin, N., Wang, H., Shen, T., et al. (2020). a randomized controlled trial on the effectiveness of a portable patient education video prior to coronary angiography and angioplasty. Catheterization and cardiovascular interventions: official journal of the Society for Cardiac Angiography & Interventions, 96(7), 1409–1414.

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. Acta psychiatrica scandinavica, 67(6), 361-370.

## PANDEMIC AND MENTAL HEALTH

#### Assoc. Prof. Daniela Konstantinova, PhD Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: ddraganova@uni-ruse.bg

**Abstract:** The recent pandemic caused by SARS-CoV-2 has led to isolation and social distancing. Loneliness and isolation in general have been shown to be strongly associated with anxiety, depression and self-injurious behavior throughout an individual's lifetime and are accepted as risk factors for mental health during and after the imposed quarantine. At the beginning of the pandemic, people were afraid of infection and whether they would survive. Gradually, with the accumulation of experience and observation, the conclusion was reached that no less dangerous is the so-called post covid syndrome. Mainly, fear is the leading cause of damage to mental health - fear of infection, fear of life, fear of consequences, fear of income, fear of loved ones... According to the WHO definition, stress is a non-specific response of the body to any demand made on it, a response to threat, real or imagined. Panic attacks have existed well before the COVID-19 epidemic. What is specific about this pandemic is that one of the main physical symptoms of panic attacks - shortness of breath - is also one of the main signs of COVID-19.

Keywords: Pandemic, mental health. post covid syndrome JEL Codes: I 18

#### REFERENCES

A. Bendau et al., 2021, Associations between COVID-19 related media consumption and symptoms of anxiety, depression and COVID-19 related fear in the general population in Germany, European Archives of Psychiatry and Clinical Neuroscience. Vol. 271. P. 283—291. DOI:10.1007/s00406-020-01171-6

Javed B, Sarwer A, Soto EB, Mashwani ZU. The coronavirus (COVID-19) pandemic's impact on mental health. Int J Health Plann Manage. 2020 Sep;35(5):993-996. doi: 10.1002/hpm.3008. Epub 2020 Jun 22. PMID: 32567725; PMCID: PMC7361582.

Kochetova Yulia A., Maria V. Klimakova, Psychological State Researches in the Context of the COVID-19 Pandemic, E-journal «Journal of Modern Foreign Psychology» 2021, vol. 10, no. 1, pp. 48—56. DOI: https://doi.org/10.17759/jmfp.2021100105 ISSN: 2304-4977 (online) URL: https://psyjournals.ru/files/119760/jmfp\_2021\_n1\_Kochetova\_Klimakova.pdf (Accessed on 07.10.2022)

National Center for Public Health and Analysis, Analytical Report on Population Health Activities in Response to the Covid-19 Pandemic for the Period 01 March 2020 - 31 May 2021, (*Оригинално заглавие:* Национален център по обществено здраве и анализи, АНАЛИТИЧЕН ДОКЛАД ЗА ДЕЙНОСТИТЕ, СВЪРЗАНИ СЪС ЗДРАВНОТО ОБСЛУЖВАНЕ НА НАСЕЛЕНИЕТО, В ОТГОВОР НА ПАНДЕМИЯТА ОТ СОVID-19 ЗА ПЕРИОДА 01 МАРТ 2020 Г. – 31 МАЙ 2021 г.)

## THE NEED FOR NUTRITIONAL SUPPLEMENTS DURING PREGNANCY

**Chief Assist. Kina Velcheva, PhD** Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: kina.velcheva@abv.bg

Abstract: The intake of food by a pregnant woman is an extremely important process both for her organism and for the fetus that develops in her. During pregnancy, it is often necessary to take nutritional supplements. Due to the impossibility of a varied and specific food menu, the pregnant woman's busy work schedule, insufficient free time for food preparation, the high price of food products, the short shelf life of organic foods, the need for a different menu, frequent meals, but in small portions fresh food and many other factors. The purpose of nutritional supplements (supplements), which are concentrated sources of nutrients (vitamins, minerals, amino acids, PNMK) or other substances with a nutritional or physiological effect (probiotics, enzymes, bee products, powdered herbal plants and etc.), is a supplement to normal nutrition. They are not usually used alone as food, regardless of whether they have nutritional properties. They are used to correct nutritional deficiencies or to maintain an adequate intake of certain nutrients.

*Keywords: Pregnancy, Nutrition, Nutritional supplements JEL Codes:* 110, J13

#### REFERENCES

Abu-Saad, K., & Fraser, D. (2010). *Maternal nutrition and birth outcomes*. Epidemiologic Reviews, 32(1):5–25.

Dudeva, V. (2000). Aspects of Regulation of Food Additives in the European Union, NCOSA, page 4 (**Оригинално заглавие:** Дулева, В., 2000. Аспекти на регулиране на хранителни добавки в Европейския съюз, НЦОЗА, стр. 4.)

EFSA Scientific Committee. (2015). *Statement on the benefits of fish/seafood consumption compared to the risks of methylmercury in fish/seafood*. EFSA J. 13, 3982–4017.

Garza, C., & Rasmussen, K. (2000). *Pregnancy and lactation. In: Human Nutrition and Dietetics*, Edit. JS Garrow, WPT James, A. Ralph, IIIth Ed., Churchil Livingstone, 437-448.

Gernand, A., Schulze, K., Stewart, C., West, K., & Christian, P. (2016). *Micronutrient deficiencies in pregnancy worldwide: health effects and prevention*. Nature Reviews Endocrinology, 12(5): 274–289.

Kramer, M., & Kakuma, R. (2003). *Energy and protein intake in pregnancy*. Cochrane Database Syst. Rev.

Marangoni, F., Cetin, I., Verduci, E., Canzone, G., Giovannini, M., Scollo, P., Corsello, G., & Poli, A. (2016). *Maternal diet and nutrient requirements in pregnancy and breastfeeding*. An italian consensus document. Nutrients, 8(10): 629.

Ordinance No. 1/ 22.01.2018 on the physiological norms for feeding the population (**Оригинално заглавие:** Наредба  $N_{2}1/22.01.2018$  г за физиологичните норми за хранене на населението.)

Oumachigui. A. (2002). *Prepregnancy and Pregnancy Nutrition and Its Impact on Women's* Health. Nutr Rev, (II), 2002, S64-S67.

Prentice, A., & Goldberg, G. (2000). *Energy adaptations in human pregnancy: limits and long-term consequences*. Amer J Clin Nutr, 2000, 71 (suppl),1226S-1232S.

Ramachandran, O. (2002). *Maternal Nutrition – Effect on Fetal Growth and Outcome of Pregnancy*. Nutr. Rev., 60, (II), S26-S34.

# THE BIRTH PLAN AS A TOOL OF INFORMED CHOICE FOR THE WOMAN GIVING BIRTH

#### Assist. Veselka Mihaylova

Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: vmihaylova@uni-ruse.bg

Abstract: The mass medicalization of childbirth, led to further advocates of natural childbirth publishing best practice procedures. The WHO, includes the importance of effective communication in recommendations for a positive birth experience published in 2018. It focuses on the experience of care as a critical aspect of ensuring high-quality birth and improved woman-centred outcomes. Recommendations include, antenatal education courses for parents, informed choice and a woman's right to manage her own body, use of a birth plan as an information and education tool. Attendance at antenatal childbirth education courses led by a midwife and the development of a birth plan are associated with more vaginal births. These findings suggest that patient education and preparation for childbirth can influence how childbirth will flow, providing them with informed choices. Education and birth plans can be used as quality improvement tools to potentially reduce cesarean sections. The aim of this report is to examine the effect of the development and implementation of birth plans, during the birth process and the satisfaction of women giving birth.

Keywords: birth plan, informed choice, prenatal education, maternity.

JEL Codes: L1

#### REFERENCES

Afshar Y, Wang ET, Mei J, Esakoff TF, Pisarska MD, Gregory KD. Childbirth Education Class and Birth Plans Are Associated with a Vaginal Delivery. Birth. 2017 Mar;44(1):29-34. doi: 10.1111/birt.12263. Epub 2016 Nov 15. PMID: 27859592.

Berg M, Lundgren I, Lindmark G. Childbirth experience in women at high risk: is it improved by use of a birth plan? J Perinat Educ. 2003 Spring;12(2):1-15. doi: 10.1624/105812403X106784. PMID: 17273335; PMCID: PMC1595149.

DeBaets AM. from birth plan to birth partnership: enhancing communication in childbirth.Am J Obstet Gynecol. 2017 Jan;216(1):31.e1-31.e4. doi: 10.1016/j.ajog.2016.09.087. Epub 2016 Sep 21. PMID: 27664497.

Hristova, Ts., (2021), Special Midwife Care for Low-Risk Pregnancies. a Guide for Student Midwives, Mediateh-Pleven (*Оригинално заглавие:* Христова, Цв., 2021. Сепциални акушерски грижи при нормална бременност. Плевен: Издателство "Медиатех-Плевен".)

Kaufman T. Evolution of the birth plan. J Perinat Educ. 2007 Summer;16(3):47-52. doi: 10.1624/105812407X217985. PMID: 18566650; PMCID: PMC1948092.

Lothian J. Birth plans: the good, the bad, and the future. J Obstet Gynecol Neonatal Nurs. 2006 Mar-Apr;35(2):295-303. doi: 10.1111/j.1552-6909.2006.00042.x. PMID: 16620258.

Moore M, Hopper U. Do birth plans empower women? Evaluation of a hospital birth plan. Birth. 1995 Mar;22(1):29-36. doi: 10.1111/j.1523-536x.1995.tb00551.x. PMID: 7741948.

Mouta, R. J. O., Silva, T. M. de A., de Melo, P. T. S., Lopes, N. de S., & Moreira, V. dos A. (2017). Plano De Parto Como Estratégia De Empoderamento Feminino. *Revista Baiana De Enfermagem31*, (4). https://doi.org/10.18471/rbe.v31i4.20275 (Accessed on 19.10.2022)

Nieuwenhuijze MJ, Low LK, Korstjens I, Lagro-Janssen T. The role of maternity care providers in promoting shared decision making regarding birthing positions during the second stage of labor. J Midwifery Womens Health. 2014 May-Jun;59(3):277-85. doi: 10.1111/jmwh.12187. Epub 2014 May 6. PMID: 24800933; PMCID: PMC4064714.

Pennell A, Salo-Coombs V, Herring A, Spielman F, Fecho K. Anesthesia and analgesiarelated preferences and outcomes of women who have birth plans. J Midwifery Womens Health. 2011 Jul-Aug;56(4):376-381. doi: 10.1111/j.1542-2011.2011.00032.x. PMID: 21733109.

Waller-Wise R. Birth Plans: Encouraging Patient Engagement. J Perinat Educ. 2016;25(4):215-222. doi: 10.1891/1058-1243.25.4.215. PMID: 30643368; PMCID: PMC6310908.

World Health Organization (WHO) Recommendations: Intrapartum Care for a Positive Childbirth Experience. 2018, (accessed on 2 February 2022). Available online: http://apps.who.int/iris/bitstream/handle/10665/260178/9789241550215-eng.pdf [PubMed] [Ref list] (Accessed on 19.10.2022)

## ROLE OF THE NURSE IN MENTAL HEALTH MANAGEMENT

## Assist. Stela Boneva

Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: sboneva@uni-ruse.bg

Abstract: Mental health cannot be defined only as the absence of mental illness, but as psychological well-being and/or adequate adjustment in accordance with socially accepted standards of human relations. In the modern world, mental health is defined as a state of well-being in which an individual "realizes his potential, copes with the normal stresses of life, is able to work productively and is able to contribute to society. It can be said that there is no perfect mental health, but there is a drive to achieve its optimal limits. In providing assistance to patients with mental disorders, the nurse applies a variety of professional approaches and clinical thinking skills in the fields of psychiatry, therapy, infectious diseases, etc. The treatment of such patients requires an individual approach and dynamic monitoring of the patient's condition. The psychiatric nurse must possess a high level of social intelligence, since the patient's mental illness is accompanied not so much by medical problems as by many problems of a social nature. Based on the literature review, which refers to a number of sources and various authorial judgments, the indispensable role of the nurse is proven. a nurse working in a psychiatric hospital must have communication skills combined with good theoretical knowledge in the field of psychology, psychotherapy, have a high degree of empathy, kindness, responsiveness and be able to determine the appropriate care for patients by determining their individual needs.

*Keywords: Mental health, psychological well-being, nursing, mental disorders, psychiatry JEL Codes:* 110, 120

## REFERENCES

Angelova, N., Mateva, T. (2012). Organization of complex psychosocial therapy and rehabilitation at Center for Mental Health Ruse EOOD. Scientific works of Ruse University - 2012, volume 51, series 8.3. (Оригинално заглавие: Ангелова, Н., Матева, Т., 2012. Организация на комплексна психосоциална терапия и рехабилитация в ЦПЗ Русе ЕООД. Научни трудове на Русенския университет - 2012, том 51, серия 8.3.)

Borisova, S. (2013). Application of the nursing process in the practice of the nurse. Steno Publishing House Varna. ISBN 978-954-449-644-9. (Оригинално заглавие: Борисова, С., 2013. Приложение на сестринския процес в практиката на медицинската сестра. Изд. Стено Варна. ISBN 978-954-449-644-9).

Institute of Medicine ,US. (1995). Committee on Enhancing Environmental Health Content in Nursing Practice; Pope AM, Snyder MA, Mood LH, editors. Nursing Health, & Environment: Strengthening the Relationship to Improve the Public's Health. Washington (DC): National Academies Press (US); 1995. 3, Nursing Practice. Available from: URL: https://www.ncbi.nlm.nih.gov/books/NBK232401/ (Accessed on 09.10.2022).

Kumar, A., Kearney, A., Hoskins, K., & Iyengar, A. (2020). The role of psychiatric mental health nurse practitioners in improving mental and behavioral health care delivery for children and adolescents in multiple settings. *Archives of psychiatric nursing*, 34(5), 275–280. URL: https://doi.org/10.1016/j.apnu.2020.07.022

Ministry of Health. (2022). NATIONAL HEALTH STRATEGY 2021-2030. Retrieved from URL: https://www.mh.government.bg/bg/politiki/strategii-i-kontseptsii/strategii/proekt-nanacionalna-zdravna-strategiya-2030/ (Оригинално заглавие: Министерство на здравеопазването. 2022. НАЦИОНАЛНА ЗДРАВНА СТРАТЕГИЯ 2021-2030г.). (Accessed on 01.08.2022).

Molina-Mula, J., & Gallo-Estrada, J. (2020). Impact of Nurse-Patient Relationship on Quality of Care and Patient Autonomy in Decision-Making. *International journal of environmental research and public health*, 17(3), 835. URL: https://doi.org/10.3390/ijerph17030835.

Moudatsou, M., Stavropoulou, A., Philalithis, A., & Koukouli, S. (2020). The Role of Empathy in Health and Social Care Professionals. *Healthcare (Basel, Switzerland)*, 8(1), 26. URL: https://doi.org/10.3390/healthcare8010026.

Semrau, M., Alem, A., Ayuso-Mateos, J. L., Chisholm, D., Gureje, O., Hanlon, et al. (2019). Strengthening mental health systems in low- and middle-income countries: recommendations from the Emerald programme. *BJPsych open*, 5(5), e73. URL: https://doi.org/10.1192/bjo.2018.90

Taberna, M., Gil Moncayo, F., Jané-Salas, E., Antonio, M., Arribas, L., Vilajosana, E., et al. (2020). The Multidisciplinary Team (MDT) Approach and Quality of Care. Frontiers in oncology, 10, 85. URL: https://doi.org/10.3389/fonc.2020.00085.

Toncheva, S. (2003). Educational, organizational and social aspects of the nurse's activity in primary care. Dissertation. MU Varna. (Оригинално заглавие: Тончева, С., 2003. Образователни, организационни и социални аспекти на дейността на медицинската сестра в първичната медицинска помощ. Дисертационен труд. МУ Варна.)

Townsend, M.S. (1997). Nursing diagnoses in psychiatric practice: a pocket guide for building a patient care plan. Publishing house F.A. Davis. 498 pp. ISBN-10:0803602901.

## DIABETES NUTRITION. PRINCIPLES IN PREPARING A FOOD REGIME

## Assist. Yuliyana Georgieva

Department of Health Care, University of Ruse "Angel Kanchev", Bulgaria E-mail: ygeorgieva@uni-ruse.bg

**Abstract:** Diet is an essential element in the treatment of diabetes mellitus. The ratio of the main nutrients in the menu is determined according to the goals of metabolic control. Daily caloric intake is calculated based on body weight, physical activity, gender, profession, accompanying chronic diseases. The distribution of nutritional elements (carbohydrates, proteins, fats) is individualized depending on the patient's lipid profile, accompanying chronic diseases, kidney function, and eating habits. Adherence to the basic principles of nutrition in patients with diabetes mellitus improves metabolic control, maintains normoglycemia, and prevents chronic complications.

*Key words: Principles of nutrition, normoglycemia, metabolic control, chronic complications JEL Codes:* 110, 120

## REFERENCES

Damyanova, M., (2000). Diabetes mellitus in children and adolescents. Theoretical and practical basis Sofia 2000, 241-245 (*Оригинално заглавие:* Дамянова, M. (2000). Захарен диабет у деца и юноши. Теоретически и практически основи, София 2000, 241-245)

Lakhtakia R. The history of diabetes mellitus. Sultan Qaboos Univ Med J. 2013 Aug;13(3):368-70. doi: 10.12816/0003257. Epub 2013 Jun 25. PMID: 23984020; PMCID: PMC3749019. URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3749019/ (Accessed on 19.10.2022)

Report from the Commission to the European Parliament and to the Council on foods intended for people suffering from disorders of carbohydrate metabolism (DIABETES), Commission of the European Communities, Brussels, 26.6.2008 COM(2008) 392 final (*Оригинално заглавие:* Доклад на Комисията до Европейския парламент и до Съвета относно храни, предназначени за хора, страдащи от нарушения на обмяната на въглехидрати (ДИАБЕТ), Комисия на Европейските Общности, Брюксел, 26.6.2008 г. COM(2008) 392 окончателен)

https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0392:FIN:BG:PDF (Accessed on 30.09.2022)

Тапкоva, Tsv., (2013). Diabetes mellitus Sofia: Paradigma Publishing House, 2013, 100:108 (**Оригинално заглавие:** Танкова, Цв., (2013). Захарен диабет София: Издателство "Парадигма", 2013, 100:108)

The Expert Committee on the Diagnosis and Classification of Diabetes Mellitus; Report of the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus. *Diabetes Care* 1 July 1997; 20 (7): 1183–1197. URL: https://doi.org/10.2337/diacare.20.7.1183 (Accessed on 01.09.2022)

## FRI-2B.412-1-EM1-01

## SUSTAINABLE DEVELOPMENT OF LIFE INSURANCE RELATED TO INVESTMENT FUNDS AND THE LIFE CYCLE MODEL

## Assoc. Prof. Galina Stoyanova, PhD

Center for Economic and Management Sciences Burgas Free University, Bulgaria Tel.:+359899855666 E-mail: gali\_100yanova@abv.bg

**Abstract:** Inflation and long-term low interest rates have accelerated consumer demand and a sharp shift from traditional life insurance products with guaranteed insurance amounts to equity-tied insurance. Its distinctive complexity, high costs and specific price/quality ratio, they have come face-to-face, with the ever-increasing needs and requirements of insurers for quality insurance protection and higher returns, their significantly limited knowledge and financial literacy and the necessary environmental, social and management aspects in the insurance industry that surround the whole issue. An adequate and sustainable outcome for the insured is closely linked to the balanced contribution of the life cycle model of insurance products and the proper conduct of the sales process stages by insurance intermediaries, ensuring transparency by national authorities in providing information on the integration of sustainability risks and taking into account adverse sustainability impacts on individual insurance.

*Keywords:* life insurance, life cycle, sustainable investment, digitization, insurance protection. *JEL Codes:* G22, G23, G52, G53, Q56

#### REFERENCES

Boneva, M. (2021). Concepts for the Management of Digital Business Transformations, Scientific Conference, University of Rousse "Angel Kanchev" Ruse, vol. 60, book 5.1., p. 200, 2021 (**Оригинално заглавие**: Бонева, М., Концепции за управлението на дигиталната бизнес трансформация, Научна конференция, Русенски университет "Ангел Кънчев", Русе, том 60, книга 5.1., стр. 195-202, 2021)

Ruseva, B. (2020). Green Marketing and Its Digital Dimensions in Circular Economy, Yearbook of Burgas Free University, Volume XLII, 2020, p.389) (*Оригинално заглавие*: Русева, B., Зелен маркетинг и неговите дигитални измерения в условията на кръгова икономика, Годишник на Бургаски свободен университет, том XLII, стр. 389, 2020)

Stoyanova, G., (2022). Accounting models for management of the acquisition activity in life insurance. Life insurance related to investment funds., Burgas Free University, p. 101, 2022, ISBN 978-619-253-013-6 (*Оригинално заглавие:* Стоянова, Г., (2022), Счетоводни модели за управление на аквизиционната дейност в животозастраховането. Застраховка "Живот", свързана с инвестиционни фондове., Бургаски свободен университет, Бургас, стр.101, 2022, ISBN 978-619-253-013-6 )

Insurance Code https://lex.bg/, (*Оригинално заглавие*: Кодекс за застраховането), (Accessed on 06.10.2022).

Summary of consumer trends report 2021, © EIOPA, 2022; Image copyright Adobe Stock Luxembourg: Publications Office of the European Union, 2022.PDF ISBN 978-92-9473-377-1 https://www.eiopa.europa.eu/sites/default/files/publications/reports/summary-of-eiopa-consumer-trends-report-bg.pdf, (*Оригинално заглавие*: *Резюме на доклад за потребителските тенденции 2021 г.*, © EIOPA, 2022; Image copyright: Adobe Stock Люксембург: Служба за публикации на Европейския съюз, 2022 г., PDF ISBN 978-92-9473-377-1), (Accessed on 06.10.2022).

Kaserova, B., Using life cycle theory in the organizational and financial diagnostics of the company https://eprints.nbu.bg/id/eprint/1531/1/Жизнен\_цикъл%20доклад%20%201.pdf (*Оригинално заглавие*: Касърова, В., Използване на теорията на жизнения цикъл в организационната и финансова диагностика на компанията), (Accessed on 06.10.2022).

Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on the disclosure of sustainability information in the financial services sector https://eur-lex.europa.eu/legal-content/bg/TXT/?uri=CELEX:32019R2088 (*Оригинално заглавие: Регла-мент (EC) 2019/2088 на Европейския парламент и на Съвета от 27 ноември 2019 година относно оповестяването на информация във връзка с устойчивостта в сектора на финансовите услуги*), (Accessed on 06.10.2022).

Financial Supervision Commission, http://fsc.bg (*Оригинално заглавие*: *Комисия за* финансов надзор), (Accessed on 06.10.2022 ).

# RESEARCH AND ANALYSIS OF THE FACTORS FOR SUCCESSFUL IMPLEMENTATION OF LEAN PRODUCTION IN BULGARIAN MICRO, SMALL AND MEDIUM-SIZED MANUFACTURING ENTERPRISES

## Eng. Zina Hristova, PhD Student

Department of Economics, Industrial Engineering and Management, Technical University of Sofia Tel.: +359895586542 E-mail: zinazankova@mail.bg

## Prof. Dr Eng. Ognyan Andreev

Department of Economics, Industrial Engineering and Management, Technical University of Sofia Tel.: +359882142531 E-mail: oandre@tu-sofia.bg

## Asst. Prof. Dr Gabriela Peneva

Department of Economics, Industrial Engineering and Management, Technical University of Sofia Tel.: +359882270559 E-mail: gabriela\_peneva@tu-sofia.bg

**Abstract:** This publication presents the results of a survey in Bulgarian micro-, small and medium-sized manufacturing enterprises aiming at establishing what are the main factors for a successful implementation of Lean Production. Various approaches to the defining these factors are discussed, being themselves representative publications in the world scientific literature on the subject. The questions in the survey are aimed at establishing and summarizing the reasons why Lean tools have not been implemented in Bulgarian SMEs' operations. The attitudes, capabilities and interest of different companies in the implementation of Lean are analyzed.

*Keywords:* Lean Manufacturing, Micro-, Small and Medium-Sized Enterprises, Success Factors. *JEL Codes:* M11, M21

## REFERENCES

Alkhoraif A., Rashid H., McLaughlin P., (2019). Lean implementation in small and medium enterprises: Literature review. Operations Research Perspectives Volume 6, 2019, 100089. 2018 The Authors. Published by Elsevier Ltd,

https://www.sciencedirect.com/science/article/pii/S2214716018301659, Accessed on 29.09.2022

Andreev, O. & N. Koleva 2011. Using Service Level Approach to Achieve Lean Production. Journal of Entrepreneurship & Innovation, ISSN 1314-0167, November 2011, pp. 76-85. (*Оригинално заглавие: Използване на подхода на «Ниво на обслужване» за постигане на лийн производство. Journal of Entrepreneurship & Innovation, ISSN 1314-0167, ноември 2011 е., стр. 76-85.*)

Gnanaraj, M. S., Devadasan, S.R., and Shalij, P.R. (2010). Current state maps on the implementation of Lean and Six-Sigma paradigms and an exclusive model for deploying Lean Six-Sigma in SMEs. International Journal of Productivity and Quality Management, 5 (3), 286-309.

Hu, Q., Mason, R., Williams, S. & Found, P. (2015). *Lean implementation within SMEs: a literature review*. Journal of Manufacturing Technology Management, Vol. 26 Iss: 7, pp.980 - 1012, 26(7), 980-1012. Publisher: Emerald Group Publishing Limited Copyright © 2015, Emerald Group Publishing Limited, http://dx.doi.org/10.1108/JMTM-02-2014-0013, Accessed on 28.09.2022

Ivanov V., Ivanova M., Gramenova-Angelova M., Iv. Petrov., 2016. Methodology of statistical analysis of experimental data, Bulletin of the Union of Scientists - Sliven, ISSN 1311-2864, 2016, volume 31(2), pp. 147-152. (*Оригинално заглавие: Методика за статистически анализ на експериментални данни, Известия на съюза на учените – Сливен, ISSN 1311-2864, 2016 г., том 31(2), стр. 147-152.*)

Ivanov V., Ivanova M., Gramenova-Angelova M., Iv. Petrov., 2021. Statistical analysis of experimental data on the acceleration of the center of mass of the car. Machine Mechanics, ISSN 0861-9727, Varna, 2021, vol. 125, pp. 113-119. (*Оригинално заглавие: Статистически анализ на експериментални данни относно ускорението на масовия център на МПС. Механика на машините, ISSN 0861-9727, Варна, 2021, кн. 125, стр. 113-119.*)

https://www.lifehack.bg/web/kak-se-sazdava-anketa-s-google-forms/, Accessed on 25.08.2022

https://portal.registryagency.bg/, Accessed on 19.09.2022

Shah, R. and Ward, P.T. (2003). Lean manufacturing: context, practice bundles, and performance. *Journal of Operations Management*, 21(2), 129-149.

# CONTEMPORARY SUPPLY CHALLENGES FOR BULGARIAN FURNITURE PRODUCERS

## Pr. Assist. Prof. Igor Sheludko, PhD

Department of Business Development and Innovation, Business and Management Faculty, University of Ruse "Angel Kanchev" Phone: +359-82-888-495 E-mail: isheludko@uni-ruse.bg

**Abstract:** The paper reviews the main contemporary challenges and problems for Bulgarian furniture producers regarding material supply. The research is based on a survey and interview of supply managers of furniture production companies in Ruse, Bulgaria. The main target is to reviel the impact of the logistic limitations caused by the war in Ukraine, COVID-19 and other global events, influencing the business processes of the furniture producers. The research focuses over the period of March-September 2022. Based on the interviews the author presents the list of activities the producers often apply to minimize the risks generated by the environment's uncertainty.

Keywords: Supply Chain Management, Materials, Logistic challenges JEL Codes: M11, M21

## REFERENCES

Bumgardner, M. S., & Nicholls, D. L. (2020). Sustainable practices in furniture design: a literature study on customization, biomimicry, competitiveness, and product communication. *Forests*, *11*(12), 1–16. https://doi.org/10.3390/f11121277

Todorova, A. (2021). *E-COMMERCE IN a STATE OF EMERGENCY – ONE YEAR LATER* 13. 4(3), 237–245.

Ratnasingam, J., Khoo, A., Jegathesan, N., Wei, L. C., Latib, H. A., Thanasegaran, G., Liat, L. C., Yi, L. Y., Othman, K., & Amir, M. A. (2020). How are small and medium enterprises in Malaysia's furniture industry coping with COVID-19 pandemic? Early evidences from a survey and recommendations for policymakers. *BioResources*, *15*(3), 5951–5964. https://doi.org/10.15376/biores.8.3.5951-5964

Bulgarian National Institute of Statistics (2022). Indexes for industrial production for August 2022. (*Оригинално заглавие: НСИ (2022). ИНДЕКСИ НА ПРОМИШЛЕНОТО ПРОИЗВОДСТВО ПРЕЗ АВГУСТ 2022 ГОДИНА.*)

Puspita, L. E., Christiananta, B., & Ellitan, L. (2020). The effect of strategic orientation, supply chain capability, innovation capability on competitive advantage and performance of furniture retails. *International Journal of Scientific and Technology Research*, 9(3), 4521–4529.

## ROLE OF BUSINESS INTELLIGENCE SYSTEMS IN THE OPERATIONAL MANAGEMENT OF PRODUCTION

**Ing. Georgi V. Georgiev, PhD Student** Department of Business Development and Innovation, Faculty of Business and Management, Univesity of Ruse "Angel Kanchev" Tel.: +359 899186959 E-mail: g\_georgiev81@abv.bg

Abstract: In recent years, more and more companies are interested in how to introduce a new concept of organization development. How to get process information just in time. How to best support operational decision making. This concept is called Business Intelligence System (BIS) and more specifically, how to use this system to support analytics in operational decision making. The reasons for this are economic rather than technological. The BIS methodology reveals a new way to properly manage business operational processes in systems and provides information on most root causes of problems as well as analysis and suggestions for proper decision making. This in turn allows to solve and prevent future problems in organizational and functional aspects. But also contributes greatly through the application of business intelligence system to modernize the company. The purpose of this paper is to show how operational management will benefit if we implement BIS and integrate it into operational decision making.

*Keywords:* Business Intelligence, Business Intelligence system, Analysis, Decision-Making, Management, Operational decision making, Operational review, Operational planning= JEL Codes: M13,

#### REFERENCES

ISO 9001-2015 Quality Management System Standard

Chamoni, P. and Gluchowski, P. (2010), Analytical Information Systems, Business Intelligence Technologies and Applications, 4th Completely Revised Edition, Springer, Berlin Heidelberg, 2010

Maier, R. (2004), Knowledge Management Systems-Information and Communication Technologies for Knowledge Management, 2nd Edition, Berlin, 2004

BARC. (2012), Business Intelligence im Mittelstand 2011/2012. Status quo, Ausblick und Empfehlungen, 2.Auflage, BARC-Institut, Würzburg, März 2012.

Wang, J., Chen, T. and Chiu, S. (2005), Literature Review on Data Warehouse Development. IACIS Pacific 2005 Conference Program, National Chengchi University, pp. 987-994.

https://www.minfin.bg/bg/870

 $www.ecb.europa.eu/pub/projections/html/ecb.projections202003\_ecbstaff~dfa19e18c4.bg.html$ 

# MANAGEMENT INFORMATION SYSTEMS IN BUSINESS AND IN FUTURE MANAGERS EDUCATION

## Pr. Assist. Prof. Miroslava Boneva, PhD

Department of Business Development and Innovation, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: +35982888776 E-mail: mboneva@uni-ruse.bg

**Abstract:** The paper has a scientific-applied nature and is aimed at contemporary information systems and digital devices that support managers, providing them with accurate and reliable information covering all business activities. The purpose of the report is to discuss the role of management information systems in business and in the education of students from Ruse University "Angel Kanchev". The completed research tasks (1) argue for the spread of management information systems and the importance they have in the processes of digitization and digital transformation in business and (2) present an example of using the web-based information system for comprehensive business management "bgERP" in the educational process to students who are preparing for management positions by studying in the specialties "Business Management", "Digital Management and Innovation" and "Industrial Management", educational and qualification "Bachelor" degree.

Keywords: Management Information Systems, Business Management, Education, bgERP JEL Codes: L86, O33

## REFERENCES

Cedefop (2020). Skills forecast 2020: Bulgaria. Cedefop skills forecast. https://www. cedefop.europa.eu/en/publications-and-resources/country-reports/bulgaria2020-skills-forecast (last access 23.09.2022)

European commission (2022). The Digital Economy and Society Index — Countries' performance in digitization, *https://digital-strategy.ec.europa.eu/en/policies/countries-digitisation-performance* (last access 30.09.2022)

Experta Ltd. (2020). Getting ahead of the competition with bgERP, Veliko Tarnovo, p. 233 (**Оригинално заглавие:** *Експерта ООД (2020) Да изпреварим конкуренцията с bgERP, Велико Търново, с. 233*)

Goyal D.P. (2014). Management Information Systems: Managerial Perspectives, 4th Edition (https://books.google.si/books?id=ZaNDDAAAQBAJ&printsec=frontcover&dq=Management+in formation+systems&hl=bg&sa=X&redir\_esc=y#v=onepage&q=Management%20information%20 systems&f=false)

Hrischev, R. (2018). Planning and Implementation of the ERP System in Packaging Production. Practical Aspects, *Journal of the Technical University – Sofia Plovdiv branch, Bulgaria "Fundamental Sciences and Applications", Vol. 24, 2018, pp. 25-28, http://bitly.ws/vpVj* (last access 22.09.2022)

Hrischev, R. (2020). ERP systems and data security, *IOP Conference Series: Materials Science and Engineering* 878 012009, pp. 1-7, https://iopscience.iop.org/article/10.1088/1757-899X/878/1/012009/pdf, (last access 28.09.2022)

Hrischev, R. (2022). *ERP Systems in Corrugated Packaging Industry*, 2022 57th International Scientific Conference on Information, Communication and Energy Systems and Technologies (ICEST), pp. 1-4, doi: 10.1109/ICEST55168.2022.9828736.

https://ieeexplore.ieee.org/abstract/document/9828736, (last access 23.09.2022)

Hristova, A., Petrova, S. (2022). Teachers and trainers in a changing world – Bulgaria: Building up competences for inclusive, green and digitalised vocational education and training

(VET). Cedefop ReferNet thematic perspectives series.

http://libserver.cedefop.europa.eu/vetelib/2022/teachers\_and\_trainers\_in\_a\_changing\_worl d\_Bulgaria\_Cedefop\_ReferNet.pdf (last access 23.09.2022)

National Statistical Institute (2022). Infostat, Business statistics *https://infostat.nsi.bg/infostat/pages/module.jsf*?x\_2=12 (last access 24.09.2022)

Nedyalkov, A. (2019). Information Systems in Service Operations Management. Ruse, Avnguard Print, p. 152, ISBN 978-954-337-367-3. (*Оригинално заглавие:* Недялков, A. (2019) Информационни системи в операционния мениджмънт на услугите. Русе, Авангард принт, cmp. 152, ISBN 978-954-337-367-3.)

Petkov, A. (2004). Management Information Systems, Ruse, Primaks, p. 132, ISBN 954-9972-58-5 (**Оригинално заглавие:** Петков, A. (2004) Управленски информационни системи, Русе, Примакс, с. 132, ISBN 954-9972-58-5)

Sharma, S., Thakur, K. S. (2015) Management Information System, Horizon Books, ISBN – 978-93-84044-58-9.

Statista GmbH (2022). Industry Overview https://www.statista.com/markets/ (last access 23.09.2022)

## THE MARKETING CHANNELS IN THE DIGITAL WORLD

## Pr. Assist. Prof. Daniela Ilieva, PhD

Department of Economics and International Relations, Faculty of Business and Management, Univesity of Ruse "Angel Kanchev" Phone: +359 82-888 704 E-mail: dgilieva@uni-ruse.bg

**Abstract:** Digital transformation has entered every sphere of socio-economic life at a rapid pace. The conversion of analog to digital transformed the marketing concept and it acquired digital dimensions. This transformation requires changing marketing strategies and channels to reach consumers. The digitized approach supports the achievement of market goals by business organizations. The purpose of the study is to outline the transformation of the marketing concept in the digital world and to present the main digital marketing channels and formats.

*Keywords:* Digital Marketing, Digital Channel, Digital Advertising, Digital Transformation *JEL Codes:* M31, M37

## REFERENCES

Chaffey, D. &PR Smith (2017). *Digital Marketing Excellence: Planning, Optimizing and Integrating Online Marketing.* Routlege, Taylor&Francis Group, New York

Charlesworth, A. (2014). *Digital marketing: a practical approach*. Routlege, Taylor&Francis Group, New York

Charter, M., & Polonsky, M. (2017). *Greener Marketing. a Global Perspective on Greening Marketing Practice*. Routlege, Taylor&Francis Group, New York

Molenaar, C. (2012). *e-Marketing: Application of information technology and the Internet within marketing.* Routlege, Taylor&Francis Group, New York

Kannan, P.K., Hongshuang Alice Li Hong, W. (2017). *Digital marketing: a framework, review and research agenda*. International Journal of Research in Marketing, Vol. 34, Issue 1.

Kotler, P., Kartajaya, H., & Setiawan, I. (2017). *Marketing 4.0: Moving from Tradisional to Digital*. John Wiley & Sons, Inc., Hoboken, New Jersey.

Kotler, P., Kartajaya, H., & Setiawan, I. (2021). *Marketing 5.0*: technology for humanity. John Wiley & Sons, Inc., Hoboken, New Jersey.

Sheth, Jagdish N., & Sisodia, Rajendra S. (2012) *The 4 A's of Marketing*. Routlege, Taylor&Francis Group, New York

# INTERNATIONAL TRADE IN THE CONTEXT OF AGRARIAN POLICIES

#### Assoc. Prof. Lyubomir Lyubenov, PhD

Department of Economics and International Relations, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: 082-888 347 E-mail: llyubenov@uni-ruse.bg

Abstract: Globalization processes lead to the liberalization of international trade with agricultural products, but they are balanced by the national agrarian policies of rich countries such as the common agricultural policy of the EU and others., which are protective in relation to their agrarian sectors. Developing countries, due to the strong dependence of their economies on the agrarian sector, are striving for significant liberalization. This opposition makes the liberalization of international agricultural trade slow, controversial and difficult. International trade is carried out on international markets, whose income from the trade of agricultural products and food globally ranks third after the trade in petroleum products and steel. Despite the positive prospects for the growth of international agricultural and other markets, respectively of the international trade, their depression by wars, pandemics and protective agrarian policies generates agflation and global inflation. The positives, the negatives and the contradictory nature of international trade require Bulgaria to determine its place in it, based on its competitive advantages as an exporter of certain agricultural products, respectively as an importer of others. Marketing strategies not only allow this, but also increase the export potential of Bulgarian agricultural products (cereals, bee productss, etc.) on their international markets.

*Keywords:* Globalization, Liberalization, International markets, Agrarian protectionism *JEL Codes: Q13, Q17, Q18* 

## REFERENCES

Lyubenov, L. (2013). Development of modern agrarian policies, Ruse (*Оригинално* заглавие: Любенов Л. 2013. Развитие на съвременните аграрни политики, Русе)

Mateev, I. (2016). ASEAN, V. Tarnovo, Faber, ISBN 978-619-00-0414-1. (*Оригинално* заглавие: Матеев И. 2016. ACEAH, В. Търново, Фабер, ISBN 978-619-00-0414-1)

Tsoneva, M. (2001). Agrarian policy, Sofia, ISBN 954-9574-72-5. (*Оригинално заглавие:* Цонева М. 2001. Аграрна политика, София, ISBN 954-9574-72-5)

www.wto.org, 11.12.2008; 10.07.2022

worldstopexports.com, 10.07.2022

www.worldbank.org, 11.12.2011

www.ico.org, International Coffee Organization, 07.07.2022

# AN APPROACH TO DEVELOP A METHODOLOGY FOR SELF-ASSESSMENT OF AN ENVIRONMENTAL MANAGEMENT SYSTEM THROUGH A MATURITY MODEL IN ORGANIZATIONS FROM THE MINERAL AND RAW MATERIALS INDUSTRY

## Neli Babekova – PhD Student

Department of Management and Business Development, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: +359 899906072 E-mail: nbabekova@uni-ruse.bg

**Abstract:** This paper reviews maturity models, aiming of presenting the essence of self-assessment using a maturity model of environmental management systems as a factor for achieving sustainable development of organizations from the mineral raw materials industry in Bulgaria. a Methodology for determining the level of maturity through a maturity model of environmental management systems, according to ISO 14001, has been developed and presented. The results of the implementation of this Methodology gives confidence to all interested parties that the company works in an environmentally friendly manner, annually assesses its current level of maturity and implements activities to increase it in order to achieve sustainable development of its activity. As a future study, the practical application of the methodology will be carried out in two companies from the mining industry.

*Keywords: Maturity model, Environmental management systems, Methodology, Mineral raw materials industry. JEL Codes: Q54* 

## REFERENCES

Integrated management system (2020) (*Оригинално заглавие:* Интегрирани системи за управление). https://www.consejo.bg/интегрирана-система-за-управление.

Maturity model (2009) (*Оригинално заглавие: Модел на зрялост*). http://tuj.asenevtsi.com/BisnesMod/BM10.htm

ISO (2015). Environmental management systems. ISO 14001:2015. International Osganization for Standardization.

ISO (2015). Quality management systems. ISO 9001:2015. International Osganization for Standardization.

ISO (2018). Quality management – Quality of an organization – Guidance to achieve sustained success. ISO 9004:2018. International Osganization for Standardization.

Ваbekova, N., Vitliemov, P., Literature review on integrated systems for quality management, environment and health and safety at work in the mining industry, Annual scientific conference of Angel Kanchev University of Ruse and Union of Scientists – Ruse,"New Industries, Digital Economy, Society - Projections of the Future III", Ruse, 2020 (*Оригинално заглавие:* Бабекова, *H., Витлиемов, П., Литературан обзор на интегрирани системи за управление на качеството, околната среда и здравето и безопасността при работа в минната индустрия,* 59-та Научна конференция на Русенски университет "Ангел Кънчев" и Съюз на учените – Русе "Нови индустрии, дигитална икономика, общество – проекции на бъдещето III", Русе 2020)

Babekova, N., Vitliemov, P., The model of maturity as a factor for sustainable development of organizations, Annual scientific conference of Angel Kanchev University of Ruse and Union of Scientists – Ruse, "New Industries, Digital Economy, Society - Projections of the Future III", Ruse, 2021 (**Оригинално заглавие:** Бабекова, Н., Витлиемов, П., Модел на зрялост като фактор за устойчиво развитие на организациите, 60-та Научна конференция на Русенски университет "Ангел Кънчев" и Съюз на учените – Русе "Нови индустрии, дигитална икономика, общество – проекции на бъдещето III", Русе 2021)

Babekova, N., Georguiev, T., Vitliemov, P., The Model of Maturity as a Factor for Sustainable Development of Organizations, 8<sup>th</sup> International Conference on Energy and Agricultural Engineering, Ruse, 2022

Ministerstvo na ikonomikata, energetikata i turizma, Mart, 2012, Natsionalna strategiya za razvitie na minnata (mineralno-surovinnata) industriya, (**Оригинално заглавие:** Министерство на икономиката, енергетиката и туризма, Март, 2012, Национална стратегия за развитие на минната (минерално-суровинната индустрия) https://mi.government.bg/files/useruploads/files/strategia.pdf.)

## **E-SERVICES IN MUNICIPALITY**

## Assoc. Prof. Pavel Vitliemov, PhD

Department of Business Development and Innovation, Faculty of Business and Management, "Angel Kanchev" University of Ruse Phone: 086-821-726 E-mail: pvitliemov@uni-ruse.bg

## Assoc. Prof. Rumen Rusev, PhD

Department of Computer Science, Faculty of Nature Science and Education "Angel Kanchev" University of Ruse Phone: 086-821-754 E-mail: pvitliemov@uni-ruse.bg

#### Senior assistant prof. Daniela Yordanova, PhD

Department of Business Development and Innovation, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: 082-888-520 E-mail: dyordanova@uni-ruse.bg

## Tsvetanka Dutsova, PhD student

Department of Business Development and Innovation, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: 082-888-726 E-mail: tsdutsova@uni-ruse.bg

**Abstract:** The priority for e-government introduction was announced more than a decade ago in Bulgaria but the transition process is very slow, ineffective and fragmented. Each structure of public administration is facing challenges to define the customers' needs and best way to provide required services. The paper dis-cusses the problem of transition of services, provided by public administration to IT based in municipalities, examinating the example of Municipality of Vidin. An analysis of types of administrative services, provided by Bulgarian municipalities is proposed. The specific of e-services is described. Based on this the way for e-service provision is defined. The services in municipality of Vidin are analysed and recommendations for improvement of the process of transition to e-services are proposed.

*Keywords:* Administrative services, public administration, e-services, e-government *JEL Codes:* H19, H89

## REFERENCES

Вопеva, M. (2020), "Research of E-services development trends", Yearbook, volume CXXIII, Academic Publishing House "Tsenov", Svishtov, 91-122. (Оригинално заглавие: Бонева, М. (2020), "Изследване на тенденциите за развитие на електронните услуги", Годишник, том CXXIII, Академично издателство "Ценов", Свищов, 91-122.)

Carter, L., Belanger, F. (2004), The utilization of e-government services: citizen trust, innovation and acceptance factors, *Information System Journal* 15, 5-25. (Accessed on 20.09.2022).

Dias, G., Rafael J. (2007), a simple model and a distributed architecture for realizing onestop e-government, Electronic Commerce Research and Applications, 6 (1), 81–90. Dobrev, B., Getsova, E. (2005), Guide to e-Government, International University, Sofia, (Оригинално заглавие: Добрев, Б, Гецова, Е. (2005), Пътеводител за електронно правителство, International University, София.)

Haag St., Cummings, M., Phillips, A. (2007), Management Information Systems for the Information Age, McGraw-Hill Irwin.

Ivanov, M. (2018), New opportunities for increasing the efficiency of the administrative services of the population. Paper presented at X<sup>th</sup> Anniversary international scientific conference "E-Governance and E-Communications" jointly with the "Science days – 2018" of TU – Sofia, 13<sup>th</sup>-17<sup>th</sup> June 2018, Sozopol. (*Оригинално заглавие:* Иванов, M. (2018), "Нови възможности за повишаване на ефективността на административното обслужване на населението". Документът е подставен на Юбилейна X международна научна конференция "Е-управление и Е-комуникации" в рамките на "Дни на науката – 2018" на ТУ - София, 13-17 Юни 2018, Созопол.)

Kiskinov, V. (2003), *Electronic Government*, SIBI, Sofia, (*Оригинално заглавие:* Кискинов, В. (2003), "Електронно правителство", СИБИ, София.)

Mihaleva, S. (2009), *The concept of "Electronic Government" in the context of e-governance*, https://ejournal.vfu.bg/en/pdfs/Svetla\_MihalevaKoncepciata\_%27Elektronno\_pravitelstvo%27\_v\_ kontektsta\_na\_elektronnoto\_upravlenie.pdf (Accessed on 21.09.2022). (*Оригинално заглавие: Михалева, С. (2009), Концепцията "Електронно правителство" в контекста на електронното* управление,

 $https://ejournal.vfu.bg/en/pdfs/Svetla\_MihalevaKoncepciata\_\%27Elektronno\_pravitelstvo\%27\_v\_kontektsta\_na\_elektronnoto\_upravlenie.pdf.)$ 

Naydenov, K. (2018), "Influence of modern achievements of e-governance on administrativemanagement processes". Paper presented at X<sup>th</sup> Anniversary international scientific conference "E-Governance and E-Communications" jointly with the "Science days – 2018" of TU – Sofia, 13<sup>th</sup>-17<sup>th</sup> June 2018, Sozopol. (**Оригинално заглавие:** Найденов, К. (2018), "Влияние на съвременните постижения на е-управление върху административно-управленските процеси". Документът е прдставен на Юбилейна X международна научна конференция "Еуправление и Е-комуникации" в рамките на "Дни на науката – 2018" на TV - София, 13-17 Юни 2018, Созопол.)

Nedyalkov, A. (2012), "Quality problems in the operational management of services", Primaks, Ruse, 105-111. (**Оригинално заглавие:** Недялков, А. (2012), Проблеми на качеството в операционния мениджмънт на услугите, Русе, Примакс, стр. 105-111.)

Реtrova, D. (2018), Ensuring interoperability in integration of administrative services. Paper presented at X<sup>th</sup> Anniversary international scientific conference "E-Governance and E-Communications" jointly with the "Science days – 2018" of TU – Sofia, 13<sup>th</sup>-17<sup>th</sup> June 2018, Sozopol. (**Оригинално заглавие:** Петрова, Д. (2018), "Осигуряване на оперативна съвместимост при интергриране на системи за административни услуги". Документът е прдставен на Юбилейна X международна научна конференция "Е-управление и Екомуникации" в рамките на "Дни на науката – 2018" на ТУ - София, 13-17 Юни 2018, Созопол.)

Santiago, E. (2008), *The Development of a model for Municipal E-government in Puerto Rico and its evalution tools*, ProQuest LLC, Puerto Rico.

Silcock, R. (2001), What is E-government?, Parliamentary Affairs, Volume 54, Issue 1, January 2001, Pages 88–101, https://doi.org/10.1093/pa/54.1.88. (Accessed on 20.09.2022).

Sprecher, M.H. (2000) *Racing to E-government: Using the Internet for Citizen Service Delivery*. Government Finance Review,

*https://www.thefreelibrary.com/Racing+to+e+Government%3A+Usong+the+Internet+for+Citiz en+Service...-a067323090.* (Accessed on 20.09.2022). Toffler, A., Toffler, H. (1995), *Creating a New Civilization: The Politics of the Third Wave*, Turner Publications Inc, 14.

Varbanov R., Kraeva V., Shishmanov K., Stefanova K., Denchev E., Parusheva S., Petrov P., (2009) "Information technologies in business", Faber, Veliko Tarnovo. (**Оригинално заглавие:** Върбанов Р., Краева В., Шишманов К., Стефанова К., Денчев Е., Парушева С., Петров П.,(2009) "Информационни технологии в бизнеса", Фабер, Велико Търново.)

Yorgova, Yu. (2013), Tools for visualization of the processes in administrative services operations - selection and application. Paper presented at Scientific conference with international participation "Knowledge - traditions, innovations, perspectives",  $14^{th}-15^{th}$  June 2013, Burgas. (**Оригинално заглавие:** Йоргова, Ю. (2013), "Инструменти за визуализиране на процесите в операциите на административните услуги – избор и приложение". Документът е прдставен на Научна конференция с международно участие "Знанието - традиции, иновации, перспективи", 14-15 Юни 2013, Бургас.)

# AN EMPIRICAL STUDY OF THE AWARENESS OF BULGARIAN SMES REGARDING THE NATURE AND CHARACTERISTICS OF LEAN MANUFACTURING

#### Eng. Zina Hristova, PhD Student

Department of Economics, Industrial Engineering and Management, Technical University of Sofia Tel.: +359895586542 E-mail: zinazankova@mail.bg

**Abstract:** This publication presents the results of a survey on the awareness of Bulgarian SMEs about the essence and characteristics of Lean Production. As key participants in the Bulgarian economy, SMEs provide about 65% of the added value and about 75% of employment in Bulgaria. They are also most sensitive to the changes in the business environment. The survey was conducted among the managerial staff of the enterprises in which Lean Production has not been implemented. Conclusions and recommendations are made about the ways and means of popularizing this modern paradigm, which is part of the toolkit of the currently ongoing Fourth Industrial Revolution.

*Keywords:* Lean Manufacturing, Micro-, Small and Medium-Sized Enterprises. *JEL Codes:* M11, M21

#### REFERENCES

Alkhoraif A., Rashid H., McLaughlin P., (2019). Lean implementation in small and medium enterprises: Literature review. Operations Research Perspectives Volume 6, 2019, 100089. 2018 The Authors. Published by Elsevier Ltd,

https://www.sciencedirect.com/science/article/pii/S2214716018301659, Accessed on 29.09.2022

Andreev, O. & N. Koleva 2011. Using Service Level Approach to Achieve Lean Production. Journal of Entrepreneurship & Innovation, ISSN 1314-0167, November 2011, pp. 76-85. (*Оригинално заглавие:* Използване на подхода на «Ниво на обслужване» за постигане на лийн производство. Journal of Entrepreneurship & Innovation, ISSN 1314-0167, ноември 2011 г., стр. 76-85.)

Hu, Q., Mason, R., Williams, S. & Found, P. (2015). *Lean implementation within SMEs: a literature review*. Journal of Manufacturing Technology Management, Vol. 26 Iss: 7, pp.980 - 1012, 26(7), 980-1012. Publisher: Emerald Group Publishing Limited Copyright © 2015, Emerald Group Publishing Limited, http://dx.doi.org/10.1108/JMTM-02-2014-0013, Accessed on 28.09.2022

Ivanov V., Ivanova M., Gramenova-Angelova M., Iv. Petrov., 2016. Methodology of statistical analysis of experimental data, Bulletin of the Union of Scientists - Sliven, ISSN 1311-2864, 2016, volume 31(2), pp. 147-152. (*Оригинално заглавие: Методика за статистически анализ на експериментални данни, Известия на съюза на учените – Сливен, ISSN 1311-2864, 2016 г., том 31(2), стр. 147-152.*)

Ivanov V., Ivanova M., Gramenova-Angelova M., Iv. Petrov., 2021. Statistical analysis of experimental data on the acceleration of the center of mass of the car. Machine Mechanics, ISSN 0861-9727, Varna, 2021, vol. 125, pp. 113-119. (*Оригинално заглавие: Статистически анализ на експериментални данни относно ускорението на масовия център на МПС. Механика на машините, ISSN 0861-9727, Варна, 2021, кн. 125, стр. 113-119.*)

Koleva, N. & Peneva, G. 2019. Empirical Study of Bulgarian SME Readiness to Implement Industry 4.0, XI International Scientific Conference "Electronic Governance and Electronic Communications", ISNN 2534-8523; (Емпирично изследване на готовността на българските MCП за внедряване на Индустрия 4.0, XI Международна научна конференция "Е-Управление и Е-Комуникации", ISNN 2534-8523;) Penchev P., 2011. Methodology for Achieving Adaptability in Production Organizations, Scientific Papers of the University of Ruse - 2011, Volume 50, Series 5.1, pp. 107 - 110. (Оригинално заглавие: Методология за постигане на адаптивност в производствените организации, Научни трудове на Русенски университет - 2011, Том 50, Серия 5.1, стр. 107 - 110.)

https://www.lifehack.bg/web/kak-se-sazdava-anketa-s-google-forms/, Accessed on 25.08.2022

https://portal.registryagency.bg/, Accessed on 19.09.2022

## POLITICAL BUSINESS CYCLE

#### Associate Prof. Kamelia Assenova, PhD

Department of Economics, University of National and World Economy, Sofia Tel.: +359 88888 2110 E-mail: kamelia\_a@yahoo.com

## Nikolay Rusev, PhD Student

Department of Economics and International Relations, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: 0899 915 045 E-mail: nrusev@uni-ruse.bg

**Abstract:** This paper reviews existing views and theories concerning the influence of the political cycle on business cycle. Political business cycle is explored with two main goals: (1) to present mainstreaming views relating political cycle to business fluctuation and (2) to identify whether the existing evidence disambiguosly finds any electoral effects on fiscal policy. The report provides a review of the theories exploring the unfluence of politically motivating fiscal decisions over the business cycle.

The empirical evidence on discretionary fiscal policy shows that there are significant politically motivated changes in in fiscal policy. Cyclicality of elections induces periodic fluctuation in fiscal decisions implemented by governments. Incumbent parties are trying to "lure" the voters through manipulating the components of aggregate demand. The theoretical explanation of macroeconomic implications of electoral cycle is trying to encompass the main incentives and techniques, parties are using in the light of incoming elections. by doing so, they could possibly turn a countercyclical policy into a procyclical. Excessed spending could change the phase and intensity of business cycles or even giving a rise to new cyclical wave.

*Keywords:* Political Budget Cycles, Discretionary Fiscal Policy, Election *JEL Codes:* E32, E62

## REFERENCES

Alesina A., Mirrlees J., Neumann M. (1989) *Politics and Business Cycles in Industrial Democracies*. Economic Policy, Vol. 4, No. 8 (Apr., 1989), pp. 57-98

Fatás A. and Mihov I. (2007) Fiscal Discipline, Volatility, and Growth

Nordhaus, W. D. (1975). *The Political Business Cycle*. Review of Economic Studies, 42, 169-190

Persson T. and Tabellini G. (1999) *Political Economics and Public Finance*. CEPR Discussion Paper No. 2235

Rogoff K. (1990) Equilibrium Budget Political Cycle. American Economic Review 80: 21-36

Rogoff K. and Sibert A. *Elections and Macroeconomic Policy Cycles*. The Review of Economic Studies, Vol. 55, No. 1 (Jan., 1988), pp. 1-16

Shi, M., & Svensson, J. (2002). *Political Budget Cycles: a Review of Recent Developments*. Nordic Journal of Political Economy, Volume 29, p 67-76

Shi, M., & Svensson, J (2005) Political budget cycles: Do they differ across countries and why? Journal of Public Economics 90 (2006) 1367 – 1389

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

## FRI-2G.404-1-EM2-01

# LEARNING IN AN ONLINE ENVIRONMENT - A PREREQUISITE FOR BURNOUT IN STUDENTS

## Assoc. Prof. Svilena Ruskova, PhD

Department of Management and Social Activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: +359 82 888-617 E-mail: *svilena\_ruskova@abv.bg* 

## Assoc. Prof. Svilen Kunev, PhD

Department of Management and Social Activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: +359 82 888 617 E-mail: *snkunev@uni-ruse.bg* 

Abstract: The report is focused on the issue of the stress that is generated in students in the online learning environment. The nature, characteristics and types of stress are examined, and the so-called professional burnout state is presented in more depth. Results from previous studies, identifying stressors impacting students and pupils during online learning, are derived and compared. Maslach's method for assessing professional burnout is clarified. In the subsequent presentation, this method is used as the main tool in conducting an empirical study related to the assessment of stress levels in students of University of Ruse "Angel Kanchev" during online learning imposed by the COVID pandemic. The obtained results are analyzed. Specific guidelines for overcoming the identified higher stress levels in order to avoid reaching a state of professional burnout are presented.

Keywords: Stress, Online Learning, Burnout, Maslach Model JEL Codes: 123

## REFERENCES

Centre for Studies on Human Stress (2007). *How to measure stress in humans?* Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital, Quebec, Canada

Felman, A. (2020). *Why stress happens and how to manage it*. Medically reviewed by Stacy Sampson, D.O.

Franke, A. (2014). Toxic Stress: Effects, Prevention and Treatment. Journal Children 1, pp. 390-402.

Marinova I., N. Radeva (2019). Basics of Stress. Factors and Symptoms, Medical University-Varna, Varna Medical Forum, Item 8, Issue 2, 45-50 (**Оригинално заглавие:** Маринова И., Н. Радева (2019). Основи на стреса. Фактори и симптоми, Медицински университет-Варна, Варненски медицински форум, т. 8, брой 2, 45-50.)

Reif J., E. Spieß, K. Pfaffinger. (2021). Dealing with Stress in a Modern Work Environment. Springer.

Daskalova-Petkova, P., D. Lazarova, M. Zamfirov. (2022) *Stress and anxiety for students during online learning*. Sofia University "St. Kliment Ohridski", Faculty of Educational Studies and the Arts, Department of Special Education, pp. 132-163.

Mosleh, S., M. A. Kasasbeha, Y. Aljawarneh, I. Alrimawi, A. R. Saifan. (2022). *The impact of online teaching on stress and burnout of academics during the transition to remote teaching from home*. BMS Medical edition, (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9207423/)

Wadhwa, S., (2017). Stress in the Modern World: Understanding Science and Society [2 volumes]. Greenwood, England.

https://ideas.repec.org/a/ssi/jouesi/v1y2013i2p108-115.html (Accessed on 16.09.2022). https://knsb-bg.org/pdf/report-final-ilo-b.pdf (Accessed on 16.09.2022).

## FRI-2G.404-1-EM2-02

# INVESTIGATING CONSUMER MOTIVATION IN THE ADOPTION OF A NEW PRODUCT UNDER THE CONDITIONS OF UNCERTAINTY

#### Assoc. Prof. Svilena Ruskova, PhD

Department of Management and Social Activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: +359 82 888-617 E-mail: *svilena\_ruskova@abv.bg* 

#### Assoc. Prof. Prof. Svilen Kunev, PhD

Department of Management and Social Activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: +359 82 888 617 E-mail: *snkunev@uni-ruse.bg* 

**Abstract:** The question related to what behavior consumers exhibit in conditions of uncertainty is extremely relevant at the present time. Therefore, the report examines consumer behavioral responses provoked by factors that generate uncertainty. The results of an empirical study aimed at researching end users from Ruse and the region regarding the perception of a new product (bio-dough snacks) are presented. It is established which motivational factors influence consumers in the process of making a decision to purchase this new for the region product by classifying potential consumers according to the Rogers model. Specific conclusions are drawn, on the basis of which recommendations are formulated, revealing possible alternatives to stimulate the generation of positive attitudes among consumers towards the new product.

*Keywords:* Consumer Behavior, Conditions of Uncertainty, Motivational Factors, New Bioproduct *JEL Codes:* L69

## REFERENCES

American Marketing Association, https://www.ama.org/the-definition-of-marketing-what-is-marketing/

Atanasov., B. (2020) Consumer Behavior in FMCG: Status and Trends. Sofia, University of National and World Economy. (**Оригинално заглавие**: Атанасов., Б. (2020) Поведение на потребителите при покупка на бързооборотни стоки: Състояние и тенденции. София, ИК УНСС)

Dictionary of the Bulgarian language, (BAS). (**Оригинално заглавие:** Речник на българския език (БАН)). https://ibl.bas.bg/

Dimova, N. (2013) Marketing aspects of emotional shopping. New Bulgarian University. (**Оригинално заглавие**: Димова, Н. (2013) Маркетингови аспекти на емоционалното пазаруване. НБУ.)

Merriam-Webster Dictionary, http://www.merriamwebster.com/dictionary/behavior

Pantaleeva, I. (2013) Innovation management in the industrial enterprise. AI "Tsenov". Svishtov. (**Оригинално заглавие:** Панталеева, И. (2013) Управление на иновациите в индустриалното предприятие. АИ "Ценов".Свищов.)

Raichev, I. (2006). Motive and motivation: socio-psychological aspects. Electronic magazine LiterNet, No. 8 (81) (**Оригинално заглавие:** Райчев, И. Мотив и мотивация: социалнопсихологически аспекти, електронно списание LiterNet, 25.08.2006, № 8 (81).) http://liternet.bg

Roger, E. Diffusion of innovation, 5 edn. New York. Free press. 2003

Solomon, M., G. Bamossy. (2002). Consumer Behavior: a European Perspective. Prentice-Hall, 2002

Solomon, M. (2011). User behavior. to buy, to have, to be. Sofia, ed. "East West" (**Оригинално заглавие:** Соломон, М. (2011). Потребителско поведение. Да купуваш, да имаш, да бъдеш. София, изд. "Изток-Запад".)

Тотоv, V. (2004). Industrial and environmental security. Varna, Varna Free University "Chernorizets Hrabar" (**Оригинално заглавие:** Томов, В. (2004). Индустриална и екологична сигурност. Варна, Варненски свободен университет "Черноризец Храбър".)

Тгаікоv, Hr., V. Solova, N., Stoyanov, M. (2005). Rational behavior within the boundaries of the trade cycle. "Science and Economics" ed., University of Economics - Varna. (Оригинално заглавие: Трайков, Хр., В. Сълова, Н., Стоянов, М. (2005). Рационалното поведение в границите на търговския цикъл, изд. "Наука и икономика", Икономически Университет – Варна.)

Yankov, N. (2006). Marketing and Marketing Management, Svishtov. (**Оригинално** заглавие: Янков, H.(2006). Маркетинг и маркетингов мениджмънт, Свищов)

https://www.europarl.europa.eu/factsheets/bg/sheet/77/Устойчиво потребление и производство (Accessed on 28.09.2022).

https://www.fao.org/3/i4354e/i4354e.pdf (Accessed on 28.09.2022).

https://www.mi.government.bg/bg/themes/inovacii-opredeleniya-primeri-1295-287.html (Accessed on 28.09.2022).

https://nbabc.bg/bg/for-users/gods-food (Accessed on 28.09.2022).

https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2014/0100%28COD%2 9&l=en (Accessed on 28.09.2022).

## FRI-2G.404-1-EM2-03

# STAFF MANAGEMENT DURING THE PANDEMIC AND CHANGES IN **LEGISLATION**

#### Pr. Assist. Prof. Bozhana Stoycheva, PhD

Department of Management and Social Activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone 082 888715 E-mail: bstoycheva@uni-ruse.bg

Abstract: The coronavirus pandemic has impacted the operations and put into question the future survival of many organizations worldwide. The change in the way of life caused by the new normal posed challenges to the performance of the daily work duties of the employees and tasks for the organization. These changes have an impact on certain lines of activity, which necessitates their study and management for the future survival of organizations. The spread of the disease COVID-19 at the end of 2019 led to the imposition of anti-epidemic measures that affected social life. These new measures, which were introduced and repeatedly changed, are implemented mainly in the form of new rules and restrictions introduced in various regulatory documents. In this regard, the changes in labor legislation introduced as a result of the spread of the corona virus infection and the impact they have on the activities of organizations and the management of those employed in them are of interest.

Keywords: Human resource management, Management decision, Pandemic situation JEL Codes: M12, Ll3

## REFERENCES

BENESOVA, A., TUPA, J. (2017) Requirements for education and qualification of people in Industry 4.0. Procedia Manufacturing, 11, 2195-2202.

ESTERVAN, A. et.al. (2017) The relation between 21st-century skills and digital skills: a systematic literature review. Computers in Human Behavior Volume 72, Pages 577-588.

Kodeks na truda, (оригинално заглавие: Кодекс на труда) available from: https://www.justice.government.bg/home/normdoc/1594373121, last acsess: 28.08.2022.

LOCKEE, B. (2021) Online education in the post-COVID era. Nature Electronic, Vol. 4, 5-6, available from: https://www.nature.com/articles/s41928-020-00534-0

SCHNEIDER, S., COUNCIL M. (2020) Distance learning in the era of COVID-19. Arch Dermatol Res 8:1. https://doi.org/10.1007/s00403-020-02088-9, [online], available from: https://link.springer.com/article/10.1007/s00403-020-02088-9

SHETTY, Sh., SHILPA C., DEY D., and KAVYA. S. (2020) Academic Crisis During COVID 19: Online Classes, a Panacea for Imminent Doctors. Indian J Otolaryngol Head Neck Surg [online], available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7568026/.

STOYCHEVA, B., RUSKOVA S. (2020). Management solutions in an emergency situation. Economic science, education and the economy: development and interactions in the digital age. Proceedings of the Jubilee International Scientific Conference dedicated to the 100th anniversary of the University of Economics – Varna. Vol. III, p. 567-579.

STOYCHEVA, B. (2021) Challenges towards the organization of the work process and personnel management in the conditions of a pandemic situation. В Сборник с доклади от Международна научно-практическа конференция 2021 "Управление на човешките ресурси", издателство "Hayka и Икономика", University of Economics - Varna, pp 146-155, ISBN 978-954-21-1092-7, http://conference.ue-varna.bg/hrm/wp-

content/uploads/Proceedings/HRMConfProceeding2021.pdf
Zakon za darzhavniya slyzhitel (оригинално заглавие: Закон за държавния служител), available from: https://www.gli.government.bg/sites/default/files/upload/documents/2021-01/zakon-za-drzhavniya-sluzhitel.pdf, last acsess 23.09.2022.

Zakon za zdraveto (оригинално заглавие: Закон за здравето), available from: https://www.mh.government.bg/media/filer\_public/2021/03/08/zakon\_za\_zdraveto.pdf, last acsess 21.09.2022.

Zakon za merkite I deistviyata po vreme na izvanredno polozhenie, (оригинално заглавие: Закон за мерките и действията по време на извънредното положение, обявено с решение на Народното събрание от 13 март 2020 г. и за преодоляване на последиците, available from: (https://asp.government.bg/uploaded/files/4822-

ZAKONzamerkiteidejstviqtapovremenaizvynrednotopolojenieobqvenosresenienaNarodnotosybr.p df), last acsess 12.09.2022.

## SPECIFICS OF THE SUCCESSFUL INTRAPRENEUR

#### Denitsa Fileva – PhD Student

Department of Management and Social Activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: 0878947135 E-mail: *dfileva@uni-ruse.bg* 

#### Assoc. Prof. Daniel Pavlov, PhD

Department of Management and Social Activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: 0884343132 E-mail: *dpavlov@uni-ruse.bg* 

**Abstract:** The intrapreneurs are rather important factor for the success of any firm. They have exceptional role in the industrial companies, because of their different point of view and energy to initiate new elements in the company. Therefore, it is important to know their specifics. The purpose of this paper is to outline some of the specifics of the successful intrapreneurs from theoretical point of view. The here done research is part of a PhD research activities on the machine building companies in Bulgaria.

Keywords: Intrapreneurs, specifics JEL Codes: L10, L11

#### REFERENCES

Alam, M.Z., Nadia Nasir and Ch. Abdul Rehman. (2020). Intrapreneurship concepts for engineers: a systematic review of the literature on its theoretical foundations and agenda for future research // Journal of Innovation and Entrepreneurship. URL: https://doi.org/10.1186/s13731-020-00119-3

Atari, S., Prause, G. (2019). Lean Intrapreneurship for Networked Manufacturing Enterprises // Journal of Entrepreneurship and Innovation in Emerging Economies 5(1) 10–21, 2019, URL: https://journals.sagepub.com/doi/full/10.1177/2393957518815288

Bernard, C. (2017). Evaluating Intrapreneurship Levels at an Eastern cape automotive manufacturing plant. Nelson Mandela Metropolitan University.

URL: http:// hdl.handle.net/10948/14960

Business start (2022). Entrepreneurship.

URL: https://sites.google.com/site/predpriemac/kakvo-e-predpriemacestvo .

Darby, G. (2004). THE LAST WORD // RSA Journal. 151(5514), 58. URL: http://www.jstor.org/stable/41379530

De Jong, J. P. J., Wennekers S. (2008). Intrapreneurship. Conceptualizing entrepreneurial employee behavior. URL: www.researchgate.net/publication/5012628

Divakara, S. (2019). *INTRAPRENEURSHIP*, *Initiatives for rejuvenating SMEs: case studies medium scale manufacturing industry in Sri Lanka*.

URL: www.researchgate.net/publication/331119305

Fileva, D., Pavlov, D. (2020). Impact of mind maps for improvement of intrapreneurship in small industrial companies // *PROCEEDINGS OF UNIVERSITY OF RUSE - 2020*, volume 59, book 5.3, University of Ruse, 2020, pp. 64-69, ISBN 2603-4123. URL: *http://conf.uni-ruse.bg/bg/docs/sns/2020/BM.pdf*.

Hristova, V. (2013). Entrepreneurship – theoretical fundaments and practical dimensions. Abagar. V Tarnovo. (**Оригинално заглавие:** Христова, В. Предприемачеството - теоретични основи и практически измерения. Абагар. В Търново. 2013).

Капеч, Р., Hristova, V. (2011). Entrapreneurship. D.A.Tsenov, Svishtov. (**Оригинално** заглавие: Кънев, П., Христова, В. Предприемачество. Академично издателство "Д. А. Ценов". Свищов. 2011)

Kotsev, E. (2022). Knowing When and How to Trust Superiors' Decisions: Toward a Conceptual Model of Subordinate Managers' Behavior. // Organizacija, 2022, No 55, pp. 50-63. URL: https://www.sciendo.com/article/10.2478/orga-2022-0004

Pinchot, G. (2011). The Intrapreneur's Ten Commandments. URL: http://www. pinchot.com/2011/11/the-intrapreneursten-commandments.html Hisrich, R. (2014). Advanced Introduction to Entrepreneurship. Edward Elgar Publishing.

Pinchot, G., Pinchot, E. (1978). *Intra-Corporate Entrepreneurship. Satisfactoru Essays*. Tarrytown School for Entrepreneurs in New York. URL: *http://www.intrapreneur.com/MainPages/History/IntraCorp.html* 

Director C (1985) Intropreneuring, who you don't have to leave the com

Pinchot, G. (1985) *Intrapreneuring: why you don't have to leave the corporation to become an entrepreneur*. New York. Harper & Row Publishers.

Saka, D. (2014). Intrapreneurship Under the Microscope: the Terminology and Ideology of Intrapreneruship; Nature of Intraprenueral Employees and Corporations; and Ways of Achieving and Benefits of Intrapreneurship. URL: https://www.researchgate.net/publication/259762311

Simeonova, A., Nedyalkov, A. (2020). Research on Application of Lean Tools: Some Cases from Service Companies // Journal of Entrepreneurship & Innovation, 2020, No 12, pp. 55-59. URL: http://jei.uni-ruse.bg/Issue-2020/05.Simeonova.pdf

Vasilska, M. (2014). Education in corporative entrepreneurship at UNWE // Journal Economic and Social Alternatives. UNWE, Sofia. (**Оригинално заглавие**: Василска, M. Обучението по корпоративно предприемачество в Университета за национално и световно стопанство. сп. "Икономически и социални алтернативи". бр. 2. 2014. ИК – УНСС).

### THE STATE OF BEING AGILE – A CASE STUDY

#### Pr. Assistant Prof. Petar Penchev, PhD

Department of Economics and International Relations, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: 082/ 888 557 E-mail: ppenchev@uni-ruse.bg

Abstract: The turbulent external environment, the global competition, fragile demand and the increasing requirements of potential customers place a big challenge to the enterprises worldwide. The agility of enterprises offers a way to help the businesses predict the new global economic trends and makes use of crucial moments as new opportunities for development. The agility of the enterprise uses internal and external change in the environment to increase its competitiveness and thus ensures stable and profitable existence of the enterprise. One objective of this paper is to define what an agile enterprise is and how the state of agility helps enterprises be more successful. The main objective is to use a methodology to evaluate the current conditions of the dynamic business ecosystem to find out what are the driving forces pushing the enterprises to be agile. The data used in the paper is derived a through a questionnaire filled by the managers of ten randomly selected industrial enterprises in Bulgaria. Analysed is that part of the questionnaire which deals with the turbulence of the external environment of the enterprises. The results show that most of the tested enterprises have challenges given by the ecosystem in which they operate.

*Keywords:* Agile, Enterprise, Industry, External Environment *JEL Codes:* M21

#### REFERENCES

Bernardes, E. H. M., 2009. a theoretical review of flexibility, agility and responsiveness in the operations management literature. *Bernardes, ES and Hanna, MD "A theoretical review of flexibility, agility and responsiveness in International Journal of Operations & Production Management,* Volume 291, pp. 30-53.

Doneva, D., 2019. Ikonomika i prirodna sreda: savremenni problemi na vzaimodejstvieto [Economics and Natural Environment: Contemporary Problems of Interaction]. Veliko Tarnovo: I and B.

Drucker, P., 1995. *Managing in a Time of Great Change*. New York: Truman Talley Books/Dutton.

Hall, E. A. R. J. W. J., 1994. How to Make Reengineering Really Work. *THE McKINSEY QUARTERLY*, Volume 2, p. 197.

Holweg, M., 2005. The three dimensions of responsiveness. *International Journal of Operations & Production Management*, Volume 25 7/8, pp. 603-622.

Kenarova-Pencheva, I. P. P., 2017. *The Impact of Internal Branding on Employee Engagement in the Tourism Sector of Bulgaria.* Santorini, Tourism: Trends, Prospects and Implications for Enterprises and Destinations, Santorini.

Kosuliev, A., 2015. Zasto sastestvuva firmata. Opit za integriran podhod. [Why Does the Company Exist - an Attempt for an Integrated Approach]. In: *Aspects of Uncertainty in the Economic Life*. Ruse: Primax, pp. 43-71.

Marichova, A., 2015. *Dinamichnite vazmojnosti na firmata*. [Dynamic Capabilities of the Enterprise]. Sofia: Avangard Prima.

Penchev, P., 2015. *Emergence and Evolution of the Concept of the Agile Enterprise*. Varna, p. 17.

Sharifi, H. Z. D., 2001. Agile Manufacturing in Practice Application of a Methodology. *Sharifi, H., Zhang, D. "Agile Manufacturing in Practice AppliInternational Journal of Operations & Production Management, Volume 21 No. 5/6, pp. 772-794.* 

Zhang, Q. V. M. L. J., 2003. Manufacturing flexibility: defining and analyzing relationships among competence, capability, and customer satisfaction. *Zhang, Q., Vonderembse, MA and Lim, JS "" Manufacturing flexibility: defining and analyzing relationships among cJournal of Operations Management,* Volume 21 2, pp. 173-191.

# PRODUCT DEVELOPMENT – AGILE APPROACHES FOR THE ENTERPRISE

#### Pr. Assistant Prof. Petar Penchev, PhD

Department of Economics and International Relations, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: 082/ 888 557 E-mail: ppenchev@uni-ruse.bg

Abstract: The conditions of the current financial and economic environment, prove the need for additional research and promoting new ways of organizing the product development process of enterprises. The turbulent external environment, the global competition, fragile demand and the increasing often unpredictable requirements of potential customers place a big challenge to the enterprises worldwide. The agility of enterprises offers a way to survival, development and growth potential in this highly turbulent business reality. It helps the business to predict the new global economic trends and makes use of crucial moments as new opportunities for development. The agility of the enterprise uses internal and external change in the environment to increase its competitiveness and thus ensures stable and profitable existence of the enterprise. The agile methods of product development help the enterprise generate rapid and continuous innovation in order to manage the changing priorities in the pursuit of meeting the customer's expectations.

Keywords: Agile, Agility, Product Development, Agile Manufacturing JEL Codes: M21

#### REFERENCES

J. Thompson, Organization in Action, fifth ed., New Brunswick, New Jersey: Transaction Publishers, 1967, pp. 1-192.

J. Selsky, "Hyperturbulence and the emergence of the type 5 environment," Academy of Management Review, p. 3, 1984.

D. A. Small A.W., "Orchestrating Changes Multiple: a framework for Managing Concurrent Changes of Varied Type and Scope," in *Conference on Managing Virtual Enterprise*, Canada, 1996.

P. Drucker, "Comeback of the entrepreneur," Management Today, pp. 22-30, 1968.

P. Drucker, Managing in a Time of Great Change, New York: Truman Talley Books / Dutton, 1995, pp. 1-352.

I. Institute, 21st century Manufacturing Enterprise Strategy: An Industry-Led View of Agile Manufacturing vol. 1 & 2, Bethlehem: Lehigh University, 1991, pp. 1-58.

H. Sharifi, "Agile Manufacturing in Practice Application of a Methodology," *Journal of Operations & Production Management*, vol. 21, no. 5/6, pp. 772-794, 2001.

A. Kosuliev, "Why Does the Company Exist - an Attempt for an Integrated Approach," in *Aspects of Uncertainty in the Economic Life*, Ruse, Primax, 2015, pp. 43-71.

E. Trifonov, The Market: Microeconomic Issues, Ruse: Ruse University Press, 2003.

A. Marichova, Dynamic Capabilities of the Enterprise, Sofia: Avangard Prima, 2015.

J. I. S. R. I. A. I. Poolton, "Agile Marketing for the Manufacturing-Based SME." Marketing Intelligence & Planning," *Marketing Intelligence & Planning Vol. 24, No. 7,* vol. 24, no. 7, pp. 681-693, 2006.

Kenarova-Pencheva, I. & Antonova, D., "The role of internal branding to increase the engagement and motivation of human resources," *Annals of Eftimie Murgu*, vol. XXV, pp. 102-108, 2018.

Kenarova-Pencheva, I., Penchev, P., "The Role of Human Resources and the Impact of Internal Branding on Employee Engagement," Ruse, 2017.

P. Penchev, "Emergence and Evolution of the Concept of the Agile Enterprise," 2015.

M. e. a. Riesner, "Innovation Ecosystem for Industrial Systainability," *Procedia CIRP 80*, pp. 27-32, 2018.

J. Moore, The death of competition. Leadership and strategy in the age of business ecosystems, Harper Business, 1996, pp. 1-297.

N. I. Takeuchi H., "The new new product development game: stop running the relay race and take up rugby," *Harvard Business Revue*, 1986.

C. G. K. S.-R. S. L. U. Gerber, "Agile Development of Physical Products-A Case Study of Medical Device Product Developmen," in *Research into Design for a Connected World, Smart Innovation, Systems and Technologies*, Singapore, Springer Nature Singapore Pte Ltd, 2019, pp. 823-834.

K. S. J. Schwaber, "The Scrum Guide," 26 08 2019. [Online]. Available: https://www.scrumguides.org.

H. S. S. S. K. Terho, "The developers dilemma: Perfect product development or fast business validation?," in *Product-Focused Software Process Improvement - 17th International Conference, PROFES 2016, Proceedings*, 2016.

E. C. E. C. S. G. R. M. K. J. A. D. C. J. S. Rebentisch, "Agility Factors and their impact on Product Development Performance," in *DS 92: Proceedings of the DESIGN 2018 15th International Design Conference*, 2018.

E. A. D. d. S. S. D. F. A. K. D. Conforto, "The agility construct on project management theory," *International Journal of Project Management*, vol. 34, no. 4, pp. 660-674, 2016.

Hull, E., Jackson, K., Dick, J., Requirements Engineering, Springer: Cham, 2017.

McManus, H., Hastings, D., "A Framework for Understanding Uncertainty and its Mitigation and Exploitation in Complex Systems," *IEEE Engineering Management Review*, vol. 34, no. 3, pp. 81-94, 2006.

E. B. S. Asan, "Agility Problems in Traditional Systems Engineering – a Case Study," in *Proceedings of the Third International Conference on Complex Systems Design & Management CSD&M 2012*, 2013.

R. B. T. Ramasesh, "A conceptual framework for tackling knowable unknown unknowns in project management," *Journal of Operations Management*, vol. 32, pp. 190-204, 2014.

R. Cooper, "Perspective: The stage-gate-idea-to-launch-process-update, what's new, and NextGen Systems," *Journal of Product Innovation Management*, vol. 16, no. 5, pp. 299-310, 2008.

W. Royce, "Managing the Development of Large Software Systems",," in *Proceedings of IEEE WESCON*, 1970.

V. S. C. N. S. Vinekar, "Can agile and traditional systems development approaches coexist? An ambidextrous view," *Information Systems Management, Vol. 23 No. 3*, pp. 31-42, 2006.

F. Glaiel, "Agile Project Dynamics: a System Dynamics Investigation of Agile Software Development Methods," *Engineering Systems Division*, 2012.

K. B. B. G. J. M. R. S. K. S. J. Beck, "Manifesto for Agile Software Development," 26 08 2019. [Online]. Available: http://agilemanifesto.org.

S. Augustine, Managing Agile Projects, Upper Saddle River, NJ: Pearson Education, 2005.

PMI, "PMI's Pulse of the Profession report:Capturing the Value of Project Management Through Organizational Agility," 2015.

S. Denning, "Why Agile can be a game changer for managing continuous innovation in many industries," *Strategic Leadership*, pp. 5-11, 2013.

D. L. B. G. D. P. I. Z. N. Ciric, "Agile Project Management in New Product Development and Innovation Processes: Challenges and Benefits Beyond Software Domai," in 2018 IEEE International Symposium on Innovation and Entrepreneurship (TEMS-ISIE), Beijing, 2018.

# CONSTRUCTION PERMITS AND THE BUSINESS CYCLE. THE CASE OF BULGARIA

**Pr. Assist. Prof. Aleksandar Kosuliev, PhD** Department of Economics and International Relations, Faculty of Business and Management, University of Rousse "Angel Kanchev" Tel.: 082/ 888 557 E-mail: akosuliev@uni-ruse.bg

**Abstract:** This paper examines the relationship between new construction permits and GDP change in Bulgaria. We use descriptive statistics and bivariate tests to find out if construction permits can be used as an early predictor of developments in the business cycle. Conclusions are drawn about the applicability of this approach on the regional level, where data about GDP is publicly available only on an annual basis and fluctuations in economic activity are more difficult to detect.

*Keywords:* construction permits, economic growth, Bulgarian regions, housing market *JEL Codes:* E01, E32, E37, R31

#### REFERENCES

Cheung, C., Granovsky, D. (2016). New housing registrations as a leading indicator of the BC economy. *Bank of Canada Staff Discussion Paper*, No. 2016-3.

Ferrara, L., & Vigna, O. (2010). Cyclical Relationships Between GDP and Housing Market in France: Facts and Factors at Play. In *Housing Markets in Europe* (pp. 39–60). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-15340-2\_3

Green, R.K. (2022). Is housing still the business cycle? Perhaps not. In *Handbook of Real Estate and Macroeconomics* (pp. 269–283). Edward Elgar Publishing. https://doi.org/10.4337/9781789908497.00018

Proietti, T., Giovannelli, A., Ricchi, O., Citton, A., Tegami, C., & Tinti, C. (2021). Nowcasting GDP and its components in a data-rich environment: The merits of the indirect approach. In *International Journal of Forecasting* (Vol. 37, Issue 4, pp. 1376–1398). Elsevier BV. https://doi.org/10.1016/j.ijforecast.2021.04.003

Тоdorov, I., Aleksandrov, A. (2018). Dating and forecasting the business cycle in Bulgaria. In Economic and social alternatives, 2/2018. (**Оригинално заглавие:** Тодоров, И., Александров, А. (2018). Датиране и прогнозиране на икономическия цикъл на България. В "Икономически и социални алтернативи", брой 2, 2018.)

Uzun, N. (2014). The influence of the world financial crisis on housing construction in Bulgaria. In Dialog, 3/2014. (Оригинално заглавие: Узун, Н. (2014). Въздействие на световната финансова криза върху жилищното строителство в България. В "Диалог", 3/2014)

# CONCEPTUAL FRAMEWORK FOR THE ECONOMIC EVALUATION OF FULLY-SUBSIDISED PUBLIC TRANSPORT IN THE MUNICIPALITY OF RUSE, BULGARIA

#### Pr. Assist. Prof. Aleksandar Kosuliev, PhD

Department of Economics and International Relations, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: 082/ 888 557 E-mail: *akosuliev@uni-ruse.bg* 

#### Pr. Assist. Prof. Elizar Stanev, PhD

Department of Economics and International Relations, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: 082/ 888 557 E-mail: *eastanev@uni-ruse.bg* 

**Abstract:** In this paper we do a selective survey of the introduction of a fare-free public transport system in several European cities and draw conclusions about the possible effects of a similar hypothetical policy measure in the city of Ruse, Bulgaria. In order to achieve this goal, we propose a conceptual framework to identify the possible stakeholders, as well as the positive and the negative consequences from such a measure. Its implementation should be based on clear data-driven criteria and preliminarily specified conditions to determine it as successful

*Keywords:* Public Transport, Transport Policy, Fare-Free Transport, Bulgaria *JEL Codes:* L99

#### REFERENCES

Brand, R. (2008). Co-evolution of Technical and Social Change in Action: Hasselt's Approach to Urban Mobility. Built Environment, 34(2), 182-199. https://doi.org/10.2148/benv.34.2.182

Cats, O., Reimal, T., & Susilo, Y. (2014). Public Transport Pricing Policy. In Transportation Research Record: Journal of the Transportation Research Board (Vol. 2415, Issue 1, pp. 89–96). SAGE Publications. https://doi.org/10.3141/2415-10

Cats, O., Susilo, Y.O. & Reimal, T. The prospects of fare-free public transport: evidence from Tallinn. *Transportation* 44, 1083–1104 (2017). https://doi.org/10.1007/s11116-016-9695-5

Cools, M., Fabbro, Y., & Bellemans, T. (2016). Free public transport: a socio-cognitive analysis. In Transportation Research Part A: Policy and Practice (Vol. 86, pp. 96–107). Elsevier BV. https://doi.org/10.1016/j.tra.2016.02.010

De Witte, A., Macharis, C., & Mairesse, O. (2008). How persuasive is 'free' public transport? In Transport Policy (Vol. 15, Issue 4, pp. 216–224). Elsevier BV. https:// doi.org/10.1016/j.tranpol.2008.05.004

Fearnley, N. (2013). Free Fares Policies: Impact on Public Transport Mode Share and Other Transport Policy Goals. In International Journal of Transportation (Vol. 1, Issue 1, pp. 75–90). NADIA. https://doi.org/10.14257/ijt.2013.1.1.05

Hess, D. B. (2017). Decrypting fare-free public transport in Tallinn, Estonia. In Case Studies on Transport Policy (Vol. 5, Issue 4, pp. 690–698). Elsevier BV. https://doi.org/10.1016/j.cstp.2017.10.002

Laverty, Anthony A, Rachel Aldred, and Anna Goodman. 2021. "The Impact of Introducing Low Traffic Neighbourhoods on Road Traffic Injuries." Findings, January. *https://doi.org/10.32866/001c.18330*.

# KNOWING, UNDERSTANDING, AND CONVERSING. THREE GEOCOMMUNICATION CASE STUDIES FROM ASIA. APPLIED PERSPECTIVE.

#### Prof. Maria Stefanova Neikova, PhD

Faculty of Journalism and Mass Communication Sofia University "St Kliment Ohridski" Phone: 0894589090 Email: mnejkova@uni-sofia.bg

#### Ivelyna Ivanova Vatova - PhD Student, International Communication

Faculty of Journalism and Mass Communication, Sofia University "St Kliment Ohridski" Phone: 0894722781 Email: evatova@abv.bg

**Abstract:** The text analyzes processes, not events; development is a phenomenon shaping the common face of Japan, China and India, the three Asian countries included in this study, and outlines regionalism as a reality. Obviously, if the Cold War has radically changed the pre-WWII world order and led to its bipolarity, if the post-Cold War has imposed the image of a unipolar world due to globalization, today a new, equally radical change is in progress to a multipolar world, where those countries, achieved state independence in the first phase, and have developed national economic prosperity in the second, are already striving to position their Selves on the big chessboard of the international communication not as pawns, but as global powers.

The analysis is a part of a bigger project examining the politics-media-development nexus of Japan, China, India and 15 other countries from the so-called Far East.

*Kewwords:* Geocommunication, Developmentalism, Power, Perception, National Interest, Regionalism. *JEL Codes:* D83

#### REFERENCES

Abe, Shindzo. (2007). JAPAN and NATO: Toward Further Collaboration. Speech by Prime Minister Shinzo Abe at the North Atlantic Council. mofa.go.jp [online]. Available at: http://www.mofa.go.jp/region/europe/pmv 0701/nato.html. (Accessed on June 18, 2017)

Al-Jazeera. (2018). OPINIONS. India's Functioning Anarchy. aljazeera.com [online]. Available at: https://www.aljazeera.com/opinions/2011/8/18/indias-functioning-anarchy. (Accessed on 13 August 2019).

Appadurai, Arjun (1996). Modernity at large. Cultural Dimensions of Globalization. Mineapolis, USA: University of Minesota Press. (trans. into Bulgarian by LIK PH, 2006) 81-106.

Aso, Taro. (2006) Speech by Taro Aso, Minister for Foreign Affairs, on the Occasion of the Japan Institute of International Affairs Seminar "Arc of Freedom and Prosperity: Japan's Expanding Diplomatic Horizons". mofa.go.jp [online]. Available at: http://www. mofa.go.jp/announce/fm/aso/speech0611.html (Accessed on June 17, 2017)

Bhatt, Chetan. (2001). Hindu Nationalism: Origins, Ideologies and Modern Myths. Oxford and New York: Berg. 154-155.

Chang Ang (1997). The History of Chinese Thought. Sofia: Riva PH (transl. in English.) (in Bulgarian, Чан, Ън. (1997). История на китайската мисъл. София: Рива. 653-655).

Constitution of Japan. (2013). Japan Institute of Constitutional Law. Available at: http://www.jicl.jp/old/hitokoto/backnumber/20130923. html. (Accessed on January 23, 2018)

Enteria, Alvaro. (2010). India from Within. a Guide to India's History, Religion, Arts, Culture And Society. Preface by Mark Tully. Varanasi: Indica Books. 15-17.

Kissinger, Henry. (2011). On China. N.Y. Simon&Schuster. (transl. into Bulgarian by Trud PH, 2012). 31-37.

Media in Japan. (2013). Radio, Newspapers, Television, NHK and Privacy. Facts and details.com [online]. Available at: https://factsanddetails.com/japan/cat20/sub133/item727.html. (Accessed on November 12, 2015)

Ozawa, Ichiro. (1994). Blueprint for a New Japan. Tokyo: Kodansha International. 1994.

Pandey, Geeta. (2014). India: Five unusual messages from Narendra Modi's speech. BBC.bbc.com.news [online]. Available at: https://www.bbc.com/news/world-asia-india-28799397. (Accessed on May 14, 2018).

Report of Japan's Values and Foreign Policy: Intangible Power in International Relations. (2014). The Japan Forum on International Relations (JFIR). March 2014, p. 7.

Си, Цзиньпин. (2014). О государственном управлении. Пекин: Издательство Литературы на иностранный языках. (in Russian). (in English: Xi Jinping. On State Governance. Beijing: Literature in Foreign Languages PH).

Sorkin, Andrew Ross. (2013) The Japan Times/International New York Times to launch tomorrow; commemorative event scheduled for 23 October. Japan Times. japantimes.co.jp [online]. Available at: https://www.japantimes.co.jp/2013/10/15/press-release/the-japan-times-international-new-york-times-to-launch-tomorrow-commemorative-event-scheduled-for-oct-23/ (Accessed on November 21, 2017)

Tharoor, Shashi. (2018). Why Nations Should Pursue Soft Power. ed.ted.com [online]. Available at: https://ted2srt.org/talks/shashi\_tharoor\_why\_nations\_should\_pursue\_ soft\_power. (Accessed on April 28, 2018).

Thussu, Daya. (2013). Communicating India's Soft Power. Buddha to Bollywood. N.Y.: Palgrave MacMillan. 175-196.

## CROSS-CULTURAL MARKETING RESEARCH AS A TOOL IN STUDYING CONSUMER PSYCHOLOGY ACROSS BORDERS

#### Hristina Sokolova, PhD

Department of Economics and International Relations, Faculty of Business and Management, University of Ruse "Angel Kanchev", Ruse, Bulgaria Tel.: 0878 537015 E-mail: hsokolova@uni-ruse.bg

**Abstract:** Cross-cultural marketing research is a relatively new direction of cross-cultural research. Marketers introduce cross-cultural research methods in studying consumer psychology. The paper introduces cross-cultural marketing as a concept and presents an overview of the most popular cross-cultural research methods in marketing. Multiculturality in marketing is defined by catering to culturally diverse groups of consumers, based on national culture characteristics. The text presents the newest contributions to value orientations theories and how they are related to cross-cultural marketing research. The work focuses on research approaches applicable to multicultural environments of consumers, located in different countries.

*Keywords:* cross-cultural marketing, cross-cultural research, consumer psychology, cultural diversity *JEL Codes:* M31, M39

#### REFERENCES

Sharon Shavitt, Angela Y. Lee, and Timothy P. Johnson (2014). Cross-Cultural Consumer

Psychology. European Journal of Educational Research, Vol. 13, no. 5, pp.563-574.

Copuš, L. & K. ČARNOGURSKÝ (2017, June). Intercultural marketing: Culture and its influence on the efficiency of Facebook marketing communication. *Management & Marketing: Challenges for the Knowledge Society*.

De Mooij, Marieke and Geert Hofstede (2011), "Cross-Cultural Consumer Behavior: a Review of Research Findings," *Journal of International Consumer Marketing*, 23 (3), 181–92.

Dickerson, D. and W. F. Pore, (2014) a global strategic framework for marketing across cultures. *Innovative Marketing*, Vol. 10, no. 3, pp. 14-23.

Naresh K. Malhotra, James Agarwal, Mark Peterson (1996) Methodological issues in crosscultural marketing research. a state-of-the-art review. *International Marketing Review*, Vol. 13 No. 5, pp. 7-43.

Jagdish N. Sheth and Atul Parvatiyar. Future directions of cross-cultural marketing research. Handbook on cross-cultural marketing. pp. 248-262.

Akaliyski, P., C. Welzel, M. H. Bond and M. Minkov (2021). On "Nationology": The Gravitational Field of National Culture. *Journal of Cross-Cultural Psychology*, Vol. 52, no. 8-9, pp.771-793. DOI: 10.1177/00220221211044780

Usunier, J.-C. and J. A. Lee (2013). Marketing Across Cultures. Pearson Education.

## MAN + MACHINE – PROSPECTS AND READING CAPACITY IN FINANCE

#### Associate Prof. Kamelia Assenova, PhD

Department of Economics, University of National and World Economy, Sofia Tel.: +359 88888 2110 E-mail: kamelia\_a@yahoo.com

#### Nikolay Petrov, PhD Student

Department of Economics and International Relations, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: +359 89586 0577 E-mail: npetrov@uni-ruse.bg

**Abstract:** This paper examines risks and opportunities concerning financial asset management and stocks. When an economic possibility appears, new players are included into the market. Bassed upon previous cumulation of data experts can see a broader picture, therefore the probability of starting businesses live expectancy estimate can get more precise. New models including age description, behavioral patterns and seasonal specifics can give advantage over traditional forecasting methods. The expanded machine learning capacity changed the landscape of investing. In a not too far distant future the investment firms can provide grants for specific startups and even be involved in founding new businesses due to precise evaluation of forthcoming public needs.

Keywords: Stocks, Cumulation of data, Investing

### REFERENCES

Kahuaoglu S. (2021) The impact of Artificial Intelligence on Governance, Economics and Finance, Volume I, Izmir Bakircay University,

Test, J. (2020) Artificial intelligence in Finance, 4 books in 1, available free online, 397-482

Cao, S. (2021). from Man vs. Machine to Man + Machine: The Art and AI of Stock

Analyses, Columbia Business School Research Paper, 97-116.

Lombardo, G. (2022) Deep Learning with Multi-Head Recurrent Neural Networks for Bankruptcy Prediction with Time Series Accounting Data, University of Parma, Italy

https://analyzingalpha.com/jim-simons-trading-strategy - article summerising PhD Jim Simons investment views and tactics, referring ,, The man who solved the market: How Jim Simons launched the Quant revolution ", written by Zickerman, G.

#### FRI-1.322-1-SW-01

## TENDENCIES OF THE REGULATORY AND LEGAL BASIS OF THE SOCIAL RESPONSIBILITY OF BUSINESS AND SOCIAL INVESTMENT

#### Prof. Diana Antonova, DcS

Department Management and Social Activities Faculty of Business and Management University of Ruse "Angel Kanchev" E-mail: dantonova@uni-ruse.bg

**Abstract:** The modern development of CSR in our country coincides with the transition to building a market economy and social democracy. In order for CSR in Bulgaria to become not a temporary trend, but a law for business behavior, as in Europe and the USA, a complex of legislative initiatives and additional stimulating measures are needed.

At the beginning of the third decade of the XXI century, the role of business in the social life of the country increased. Its influence on the social, economic and social spheres is becoming more and more noticeable. Therefore, it is important to analyze the possibilities and methods of the state regulation of social responsibility, first of all, from the point of view of the design of CSR and SI institutions.

Keywords: Corporate social responsibility, Social investment JEL Codes: M1, M14

#### REFERENCES

Atanasov, A., R. Marinova, (2017) Integrated reporting - a new challenge in corporate reporting // Management and Education, Issue XIII (1). https://mpra.ub.uni-muen¬chen.¬de/-85615/1/MPRA\_paper\_85615.pdf; Integrated reporting - a new challenge in corporate reporting – Atanasov, A., R. Marinova, (2017) Management and Education, Issue XIII (1) 2017.

Atanasova D., N. Venelinova (2020). Contemporary Methods in Bioinformatics and Biomedicine and their Applications. BioInfoMed 2020. Lecture Notes in Networks and Systems, vol 374, ISBN: 978-3-030-96638-6

Beloev, H., N. Venelinova (2022). a Roadmap for Planning and Implementing the Successful Transition to Fourth Generation University: The Case of Ruse University, Bulgaria //16th International Technology, Education and Deve¬lop¬ment Conference Online Conference. 7-8 March, 2022, INTED2022 Proceedings, ISBN: 978-84-09-37758-9ISSN: 2340-1079

Comparative Analysis of Decision-Making Models in National Healthcare Systems of EU Member-States: Change-Drivers' Identification

Labor and law publishing complex. //http://trudipravo.bg/znanie-za-vas/928-zakon-za-korporativnoto-podohodno-oblagane

Promote the principles and goals of corporate social responsibility. Institute of Public Administration. Good practices. https://www.ipa.government.bg/bg/dobra\_praktika/populyari-zane-principite-i-celite-na-korporativna-socialna-otgovornost (Last access. 26.01.2022)

Slavova, I., Bankova, Y., Ivanov, H., Kalinkova, S., Tsolov, L. (2014), CSR in Bulgaria – part of European social practices, UNSS Publishing Complex, ISBN 978-954-644

V. Vechev, et al. (2021). https://dlib.unisvishtov.bg/bitstream/handle/10610/4430/efd0064bae54c34057785d296bbf3014.pdf?sequence=1&isAllowed=y, Integrated accountability in the management of enterprises in Bulgaria, Scientific Studies Almanac. Volume 29, 2021, Svishtov, p. 312

https://onlinelibrary.wiley.com/doi/10.1111/jcms.12021/European Business Network for Social Cohesion (EBNSC)

http://www.bgregio.eu:8080/Content.aspx?menu=left&pid=69

https://eur-lex.europa.eu/legal-

content/BG/TXT/PDF/?uri=CELEX:52009DC0693&from=BG

 $https://www.moew.government.bg/static/media/ups/tiny/file/Industry/EMAS/Info\_EMAS/emasleaflet\_bg.pdf$ 

https://www.unglobalcompact.bg/?page\_id=150

ILO Declaration on Fundamental Principles and Rights in the Field of Labor and a Mechanism for Its Implementation, Adopted at the LXXXVI Session of the International Labor Conference, Geneva, 18 June 1998// https://www.ilo.org/wcmsp5/groups/public/ed\_norm/-declaration/documents/normativeinstrument/wcms\_763311.pdf

https://www.europarl.europa.eu/doceo/document/TA-8-2018-0382\_BG.html

https://www.mlsp.government.bg/mezhdunarodna-organizatsiya-po-truda (Last access. 01/ 26/22)

https://bdvo.org/за-бдво/sample-page-2/етичен-кодекс/

https://leasing-bulgaria.org/...%81/

https://www.bhra-bg.org/bhra/etichen-kodeks

https://www.bapm.space/w/bg/ethics-code/Център за изследване на демокрацията. https://csd.bg/bg/events/event/oficialen-start-na-khartata-za-mnogoobrazieto-v-blgarija (Last access. 01/26/22)

## IMPACT OF CONTROLLED ANXIETY AS A WAY OF DEALING WITH STRESS IN HIGH SCHOOL STUDENTS

#### Silviya Beloeva, PhD

Department of Management and Social Activities Faculty of Business and Management University of Ruse "Angel Kanchev" Phone: +359 889205663 E-mail: sbeloeva@uni-ruse.bg

Abstract: Human resources are the main factor for the successful innovative policy of the organization. The development and the consolidation of human capital is a key problem and a significant prerequisite for the competitiveness of organizations in the industrial and tertiary economic sectors. The behavior of human resources under different levels of anxiety and the degree of their creative productivity in organizations in terms of their creativity and innovation is a topical topic in the scientific space. In this regard, a social experiment was conducted, through which the behavior of human resources was observed at different levels of anxiety and the degree of their creative productivity in terms of their creative productivity in terms of their creative productivity in terms of their creativity and innovation. The aim of this report is to present and analyze some of the results of this primary social experiment. The report presents the results of only one group of participants from the conducted research - secondary school students completing specialization after secondary education.

Keywords: Anxiety, Human Factors, Creativity, Innovation, Innovation Process, Management. JEL Codes: 112, 123

#### REFERENCES

Allen, R., E. Fulton, H. Gale, K. Scat (2017) Mensa: Tests for Intelligence, Knigomania Publishing House, pp. 400, ISBN 978-619-195-154-3.

Amabile, T. M., Pratt, M. G. 2016. The dynamic componential model of creativity and innovation in organizations: Making progress, making meaning. Research in Organizational Behavior, 36: 157-183.

Antonova, D., B. Stoycheva. (2016). Methods and Tools in Development of New Products in Bulgarian Industrial Enterprises - General, Sectoral and Comparative Analysis. // Annals of "Eftimie Murgu" University Reşiţa, Fascicle II. Economic Studies, No XXIII, pp. 27-43, ISSN 2344-6315.

Beloeva, S., Antonova D. (2020), Tools representing the relationship between anxiety, creativity, innovation: metadata analysis, PROCEEDINGS OF UNIVERSITY OF RUSE - 2020, volume 59, book 5.1, Pyce, University of Ruse "Angel Kanchev", 2020, pp.118-123.

Kostadinova, I., S. Kunev (2019) Integration of principles of responsible management education in regard of social resposibility's learning needs. In:/Annals of "Eftimie Murgu" University Reşiţa. Fascicle II. Economic Studies, (December 2019). Indexation at EBSCO and Index Copernicus International. ISSN: 2344-6315.

May, R., The Meaning of Anxiety. WW. Norton & Company. Inc, 2015. ISBN 978-619-01-0224-3.

Ruskova, S., Ruseva, I., (2019) Stress management as a tool for prevention of burnout syndrome, Proceedings of University of Ruse - 2019, volume 58, book 5.1, FRI-2G.404-1-EM-06.

# METHODOLOGY FOR TRAINING STUDENTS AS PART OF THE DISCIPLINE: BASICS SOCIAL WORK (HISTORY AND THEORY)

#### Silviya Beloeva, PhD

Department of Management and Social Activities Faculty of Business and Management University of Ruse "Angel Kanchev" Phone: +359 889205663 E-mail: sbeloeva@uni-ruse.bg

**Abstract:** In social work as a science, the knowledge and methods of many sciences are used, for this reason it is said that this science has an interdisciplinary character. As a scientific and academic activity, social work is relatively new for Bulgaria. The preparation of students in the "Social Activities" specialty is important and fundamental for the future development of budding specialists in the field of social work. Professional training of graduates of the specialty provides the necessary theoretical and practical knowledge, as well as forms skills that will contribute to a wider professional realization in the field of social activities of any type.

The purpose of the report is to present modern methods and approaches which are applied to teaching of students at the universities. The methodology presents some types of exercises and the basic requirements for their structuring.

Keywords: social work, methodology, training methods, student, objects of social work, methods of social

work. JEL Codes: 123

### REFERENCES

Davis, M., Compiler (2008) Anthology: Social Work, Sofia, University Publishing House "St. Constantine and Helena" Cl. Ohrid 2008. P.. 520, ISBN:978-954-07-2088-3 (*Оригинално заглавие*: Дейвис, М., съставител (2008) Антология: Социална работа, София, Университетско издателство "Св. Кл. Охридски2008. стр. 520, ISBN:978-954-07-2088-3).

Dimitrova, N., (2001) Basics and methods of social work, ISBN:954-8683-13-X, Litera, Sofiya (*Оригинално заглавие:* Димитрова, Н., (2001) Основи и методи на социалната работа, ISBN:954-8683-13-X, Литера, София).

Меhanjiyska, D., E. Rangelova, (2009) Methods of Social Work, Gabrovo (*Оригинално* заглавие: Механджийска, Г., Е. Рангелова, (2009) Методи на социалната работа, Габрово).

Міtheva, Р. (2006) Methods in the assisting professions, Ed. M-8-M, Sofia. (*Оригинално* заглавие: Митева, П. (2006) Методи в помагащите професии, Изд. "М-8-М", София).

Shulman, L. (1994) The art of helping individuals, families and groups, Sofia, ed. Neuroscience and Behavior Foundation, p. 632 (*Оригинално заглавие: Шулман, Л. (1994)* Изкуството да се помага на индивиди, семейства и групи, София, изд. Фондация "Невронауки и поведение", стр.632).

# EFFICIENCY AND EFFECTIVENESS OF APPLICATION OF SPECIAL SEISMIC PROTECTION METHODS

**Pr. Assist. Prof. Evgeniya Bratoeva PhD** Department of Management and Social Work, "Angel Kanchev" Univesity of Ruse Phone: +359 887 243 807 E-mail: ebratoeva@uni-ruse.bg

**Abstract:** The report presents a serious and painful problem of our time - codependency. a codependent is any person who has allowed themselves to be influenced by another person's behavior and is obsessed with the idea of controlling that person's behavior. The motives are often ideal, altruistic, born of care and love in order to satisfy his needs. This approach is extremely inappropriate because while the incentives are right, the actions are wrong. Life with an addict is difficult and full of daily challenges. Often, the means of codependency are a reaction of self-defense and lead to disruption of relationships, cause pain, and, if no measures are taken, self-destruction. Psychosocial work with co-dependent persons is essential for preserving the psycho-emotional state of the co-dependent person himself and his ability to provide help and support to the addict himself. The report reviews the manifestations and characteristics of codependency and the stages of its development. There are intermediate steps to deal with the condition through individual and group psychosocial work.

Keywords: alcohol dependence, co-dependence, psychosocial work JEL Codes: 112; J10

### REFERENCES

Beattie M. (2016). Koniec wspoluzaleznienia, Publisher: Media Rodzina

Beattie, M. (2022). Codependent No More: How to Stop Controlling Others and Start Caring for Yourself , Publisher: Spiegel & Grau

Parvulova, D., *Codependence*, https://kabinet6.com/syzavisimost/ Reisch-Klose, J., Glowacz E. (2016). *Alkoholik -instrukcja obslugi*, Wydawnictwo IPS

Reisch-Klose, J. (2015). Głowacz E., Alkoholik. Instrukcja obsługi (ebook)

Woronowicz, B. T. (2009). *Uzależnienia: geneza, terapia, powrót do zdrowia*, Wydawnictwo: Media Rodzina

Woydyłło E.(2008). Podnieś głowę, P., Wydawnictwo Literackie

# GEOCOMMUNICATION. THE NEW COMMUNICATION. THEORETIC PERSPECTIVE (PART ONE)

**Ivelyna Ivanova Vatova - PhD Student, International Communication** Faculty of Journalism and Mass Communication, Sofia University "St Kliment Ohridski" Phone: 0894722781

Email: evatova@abv.bg

**Abstract:** International communication is a public communication of survival and predominance. It is a communication of pros and cons, of Self vs. Other. So, its image is of a systematic relation process between status quo and change, dialectically interconnected.

The notion of geocommunication was not born of geopolitics and geoeconomics, though associated to them. It comes from the perception of communication as the fourth fundamental human activity<sup>1</sup>. It is worked on three basic pillars: sociotechnological, intercultural and image-making communication.

Model of Geocommunication opens into radical dynamic changes of human communication algorithm in the 21<sup>st</sup> c. It introduces some terms, new for the Bulgarian Media Studies, such as geocommunication, mass Self-communication, holistic communication, etc.

It aims to provoke a debate on the transformation of Marshall MacLuan's powerful notion Media is the Message into Message is the Media in a time when mass Self-communication occurs to be a serious communicative opposition to the mass Media-communication. It aims to provoke a debate on the transformation of Marshall MacLuan's powerful notion Media is the Message into Message is the Media in a time when mass Self-communication occurs to be a serious communicative opposition to the mass Media-communication.

*Keywords:* Geocommunication, Message, Image-Perception, Image-Reception, Nationalism, Cosmopolitanism. *JEL Codes:* D83

#### REFERENCES

Anderson, B. (1991). Imagined Communities. Reflections on the origin and Spread of nationalism. London: Verso Publications. 37-47.

Calhoun, Craig. (2008). Cosmopolitanism and Nationalism. *Globalization and the State*. 14(3), 208-240

Castells, M. (2011). Communication, Power and Counterpower in the Network Society. *International Journal of Communication*. 1, 238-266

Drucker, P. (2000). The PostCapitalist Society. Sofia: LIK (trans into Bulgarian).

Homo Communicativus. Online journal. Available at http://www.sfera.umk.pl/ homocommunicativus\_ www2 (Accessed on 12 April, 2017)

Hristov, Ch. (2008). *Persuation and Influence*. Sofia: Ciela, 74-75. (Ориг. Христов, Чавдар. (2008). *Убеждаване и влияние*. София: Издателство Ciela.)

Pearce, W. Barnnett. (1989). *Communication and the Human Condition*. Carbondale and Edward-sville: Southern Illinois University Press. 3-32.

Petrov, Milko. (2005). Personal Image. Building. Control. Reception. Sofia: Atlantis-Media. (Ориг. Петров, Милко.(2005). Персоналният имидж. Изграждане. Контрол. Рецепция. София: Атлантис-Медиа)

Thussu, Daya K. (2006). *International Communication: Continuity and Change*. London: Hodder Education.

<sup>&</sup>lt;sup>1</sup>The other three are *production, reproduction* and *recreation*; communication as the 4<sup>th</sup> one is an activity with an welding effect and without it no one of the rest or their products may function.

# A FRAMEWORK FOR ESTABLISHING AN OBSERVATORY FOR SOCIAL INNOVATIONS AND INTERACTIONS: THE CROSSROAD OF THE DIVERGENT AND CONVERGENT APPROACH IN RECONSIDERING COMMUNITY ECOSYSTEMS

#### Nataliya Venelinova, PhD

Department of Management and Social Activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: +359888558782 E-mail: nvenelinova@uni-ruse.bg

Abstract: The paper aims to present the observatory model as a tool for successful interaction between different and often contradicting in their needs, expectations, and ideas stakeholders in regional ecosystems. An overview of the "observatory" concept and its application is made to rethink community policies, ensuring active involvement in all stages, from the design to the implementation, monitoring, and control. Based on the remaining foreign practices in the USA, Honduras, Brazil, as well as EU countries of establishing and developing different community-oriented observatories to reconsider or improve the management of existing ecosystems, the paper proposes a general model for designing a regional observatory for social innovations and interactions as part of the regional eco-social system. It also provides guidelines for its establishment and development. The author comments on the model in terms of digital transformation trends and their effect on applying the approach of the social observatory. The paper is an output of implementing "A study of regional potentials for development of socially innovative ecosystems in terms of digital transformation," financed under the Scientific Researches Fund"- a research project of the Faculty of Business and Management at the University of Ruse "Angel Kanchev."

*Keywords:* social observatory, innovation, interaction, eco-social system, digital transformation *JEL Codes:* C31, O35, Q56, R58

### REFERENCES

Adam, T., Røttingen, J.A., Kieny, M.P. (2015). Informing the establishment of the WHO Global Observatory on Health Research and Development: a call for papers. Health Res Policy Syst.2015(13): 9. doi: 10.1186/1478-4505-13-9

Barros, J. N, M.V. Sobrinho, A. M.de Albuquerque Vasconcellos, A. C. Cançado (2019) Social Observatory as a new space for civil society and government relationships in Belém, Pará State, Brazilian Amazon. In: INTERAÇÕES, Campo Grande, MS, Vol. 20, No. 3, p. 725-736

Bixler, P.R, et al. (2019). An Observatory Framework for Metropolitan Change: Understanding Urban Social–Ecological–Technical Systems in Texas and Beyond. In: Sustainability 2019, 11, 3611; doi:10.3390/su11133611, available on www.mdpi.com/journal/sustainability, last retrevied 3.09.2022

Guerrero, A. M., N. J. Bennett, K. A. Wilson, N. Carter, D. Gill, M. Mills, C. D. Ives, M. J. Selinske, C. Larrosa, S. Bekessy, F. A. Januchowski-Hartley, H. Travers, C. A. Wyborn, and A. Nuno. (2018). Achieving the promise of integration in social-ecological research: a review and prospectus. Ecology and Society 23(3):38. https://doi.org/10.5751/ES-10232-230338

Escoto, F.M, a Jipsion (2021) Modelo de observatorio TIC para Honduras. In: PRISMA Tecnológico, Vol. 12,1

European University Institute (2021). Academic careers observatory. Available at: https://www.eui.eu/ProgrammesAndFellowships/AcademicCareersObservatory. Last retrieved :20.09 2022.

Osborne, S.P. (Ed.). (2009). The New Public Governance? Emerging Perspectives on the Theory and Practice of Public Governance (1st ed.). Routledge.

https://doi.org/10.4324/9780203861684Perez A., M. Moreno. (2014). Un Observatorio Tecnológico con un enfoque de Inteligencia de Negocio", Ciencias de la Información Vol. 45, No. 3, pp. 11 – 18

Room, G. et al. (1992). Commission of the European Communities, Directorate General V Employment, Social Affairs and Industrial Relations. Observatory on national policies to combat social exclusion, available on https://core.ac.uk/download/pdf/148858677.pdf, last retrieved 10.10.2022

*World Bank (2015) The Social Observatory. Available on* https:// www.worldbank.org/en/programs/social-observatory, *last retrieved 07.10.2022* 

# METHODOLOGY FOR EVALUATION OF SOCIAL ACTIVITIES' AWARENESS IN HOSPITALS

#### Emilia Dimitrova – Student

Department of Management and social activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: +359 887 891 897 E-mail: emmka@abv.bg

#### Daniela Yordanova, PhD

Department of Business development and innovation, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: 082-888-520 E-mail: dyordanova@uni-ruse.bg

**Abstract:** The application of social activities in hospitals is directly related with quality of healthcare services and patients' wellbeing. There is a need of well-established relationship between the medical team and social workers for timely and adequate social services and activities provision. What is the state of art in Bulgarian hospitals and if the patients can obtain all necessary social services? to answer this question, we developed a methodology for inquiry among medical staff in hospitals. We evaluated their awareness about available social activities in hospitals and, cooperation with social workers. The inquiry was held among 171 representatives of medical staff in Bulgarian hospitals and we found out that there is not sufficient knowledge about the role and functions of social workers in hospitals. Some recommendations about qualification improvement are provided.

*Keywords:* Social activities, social work, hospitals, social services, training *JEL Codes:* 119, 131, M53

### REFERENCES

Association Strategma - Balkan Institute, (2019) Assessment of the effectiveness, efficiency and impact of the measures for deinstitutionalization and promotion of social inclusion, financed under Operational Program Human Resources Development 2007 – 2013, https://esf.bg/otsenka/ (**Оригинално заглавие:** Обединение Стратегма – Балкански институт, (2019) Оценка на ефективността, ефикасността и въздействието на мерките за деинституционализация и насърчаване на социалното включване, финансирани в рамките на ОП РЧР 2007 – 2013, https://esf.bg/otsenka/)

Cooper, A., & Wilson, A. (2002). *Extending the relevance of TSA research for the UK: general equilibrium and spillover analysis*. Paper presented at the VIth International Forum on Tourism Statistics, 25th-27th September 2002, Budapest.

Financial Mechanism of the European Economic Area and Norwegian Financial Mechanism (2014-2021), https://www.eeagrants.bg/ (**Оригинално заглавие:** Финансов механизъм на Европейското икономическо пространство и Норвежки Финансов механизъм (2014 - 2021)

Law on social services, in force from 01.07.2020, Promulgation DV. No. 24 of March 22, 2019, amended DV. No. 8 of January 28, 2022 (*Оригинално заглавие:* Закон за социалните услуги, в сила от 01.07.2020 г., Обн. ДВ. бр.24 от 22 Март 2019г., изм. ДВ. бр.8 от 28 Януари 2022г https://dv.parliament.bg/DVWeb/showMaterialDV.jsp?idMat=135546)

Law on Medical Facilities Pub. DV. No. 62 of July 9, 1999, add. DV. No. 88 of October 8, 1999, amended. and add. DV. No. 32 of April 26, 2022 (*Оригинално заглавие: Закон за* 

лечебните заведения Обн. ДВ. бр.62 от 9 Юли 1999г., доп. ДВ. бр.88 от 8 Октомври 1999г., изм. и доп. ДВ. бр.32 от 26 Април 2022г)

Rashkova, L., "Social work in the context of Social Policy" (*Оригинално заглавие: Рашкова, Л., "Социалната работа в контекста на Социалната политика"),* http://www.conference-pf.shu.bg/files/2020/dokladi/l-m-rashkova.pdf

Zhelev, S. Marketing research. Sofia, "Economics" University Publishing House, 2008 (**Оригинално заглавие:** Желев, С. Маркетингови изследвания. София, Университетско издателство "Стопанство", 2008)

# TEACHING AND LEARNING FOR SUSTAINABLE DEVELOPMENT GOALS (SDGS) THROUGH STUDY CASES

#### Irina Kostadinova, PhD

Department of Management and Social Activities, Faculty of Business and Management, University of Ruse "Angel Kanchev" Phone: +359 888 102269 E-mail: ikostadinova@uni-ruse.bg

Abstract: The complex global economic situation, as a result of the Covid'19 pandemic, is reflected in various challenges facing the world economy. The education system has also been under pressure to live to the numerous obstacles. The aim of this paper is to present real case from the practice of Bulgarian companies in the field of the shoemaking production industry with its strengths and barriers faced in the process of its active work. The information on the industry profile, the specifics of the company data and the state of the company policy of the Government in Bulgaria is up-to-date and is extracted from official documents, company records and interviews during the survey. During the last two years of on-line education, giving the opportunity to students to be an active part in the developments of study case was one of the instruments partially to overcame lack of internships in firms. One of the case studies used was "Ingilis Group" - luxury shoes that turn green", is going to be presented in the next pages.

Keywords: Corporate Social Responsibility, Sustainable Development Goals (SDGs); Responsible Education

### REFERENCES

Antonova, D. (2021) Internal social policy of the business organization and quality of working conditions, Proceedings of University of Ruse - 2021, volume 60, book 8.2.Publisher: Academic Publishing House, University of Ruse, pp. 28-34, ISSN: 2603-4123 (on-line).

Gueorguiev, T., M. Krasteva. (2014) Social Responsibility as a Means for the Sustainable Development in the Lower Danube River Basin. //Journal of Danubian Studies and Research, International Conference 'The Danube- Axis of European Identity', 4th Edition, Ruse, Bulgaria. Vol. 4, no. 1, pp. 52-62.

Dimitrov, M., N. Venelinova. (2019) Smart, Secure and Safe Energy Management Approach – An Education Framework Improving the Competence Grid of the Professionals in the Energy Sector.// 25th International conference Knowledge-Based Organization, vol. XXV, No 1, 2451-3113, Sibiu, Romania, pp.213-218.

Kunev, S. (2010). Using Case Study in Entrepreneurship and Innovation Education: Methodological Aspects. Journal of Entrepreneurship and Innovation, year II, Issue 2, pp. 45-56.

Popova, A., (2021) New social risks for the society and its systems in the conditions of the covid 19 pandemic. In Proceedings of 60 International conference of University of Ruse "Angel Kanchev", pp. 11-14, ISSN: 2603-4123.

Ruskova, S. (2021). Research of Consumer Resistance in Perception of a New Product in the Conditions of Covid Pandemic. Journal of Entrepreneurship and Innovation, 13, 55-66, ISSN 1314-0175.

Ruskova. S., I. Ruseva. (2018) Empirical study on the impact of the conflicts on the motivation of the employees// Annals of "Effimie Murgu" University Resita, No XXV, pp. 206-215.

Venelinova, N. (2021). The development of communication skills - a pledge for the successful career of the students in "social activities, Proceedings Volume 60, book 9.1. Quality in Higher EducationPublisher: University of Ruse "Angel Kanchev", pp. 45-48, ISSN: 2603-4123.

# A MODEL FOR INCLUSIVE EDUCATION OF STUDENTS WITH SPECIAL NEEDS AT UNIVERSITY OF RUSE, BULGARIA

### Ana Popova, PhD

Department of Management and Social Activities Faculty of Business and Management University of Ruse "Angel Kanchev" 8, Studentska St, Ruse 7017 E-mail: apopova@uni-ruse.bg

**Abstract:** The paper presents the model identified at University of Ruse, Bulgaria, Department of Management and Social Activities for inclusive education of students, such as: students with special needs because of physiological or mental problems, students with disabilities and students with traumas caused by family problems, violence and others. The main thesis of the paper is that the interest of such students towards studies in the area of social work and public health is provoked by their disadvantaged position and a special approach is needed in order to guarantee their successful professional realization after their graduation. The paper presents an overview of the national and European regulations in the field of inclusive education and gives some recommendations to the respective authorities for the improvement of the normative base and social practices.

*Keywords:* inclusive education, students with disabilities, traumatic behavior. *JEL Codes:* 120

### REFERENCES

Global education monitoring report. (2020) Inclusion and education: all means all. UNESCO. https://en.unesco.org/gem-report/report/2020/inclusion

IDA Inclusive Education Global Report: What an Inclusive Equitable, Quality Education Means to Us. (2020) International Disability Alliance and DFID. https://www.internationaldisabilityalliance.org/sites/default/files/ida\_ie\_flagship\_report\_english\_2 9.06.2020.pdf

Leijen, A., F. Arcidiacono and A. Baucal. (2021) The Dilemma of Inclusive Education: Inclusion for Some or Inclusion for All. Frontiers in Psychology. *https://www*. frontiersin.org/articles/10.3389/fpsyg.2021.633066/full

Наредба за приобщаващото образование. ДВ бр. 92 от 27.10.2020 г., в сила от 27.10.2020 г., изм., бр. 91 от 2.11.2021 г. https://sofia.obshtini.bg/doc/3207191/0

Приобщаващо образование. https://www.unicef.org/bulgaria/media/3951/file/BGR-Module%201%20-%20inclusive%20education-ppt.pdf

# MANAGING THE CATEGORIZATION AND SOCIAL SIGNIFICANCE OF SPECIES DIVERSITY IN THE UNIVERSITY BOTANICAL GARDEN

#### Petya Angelova, PhD

Agricultural Machinery Department, University of Ruse "Angel Kanchev" Phone: 082-888 288 E-mail: pangelova@uni-ruse.bg

**Abstract:** The paper reviews the species diversity of the Subdivision Gymnosperms in the University Botanic Garden. A botanical garden is a place where plants are grown, categorized and documented for scientific purposes. Plant species are presented with their names according to internationally recognized botanical nomenclature. A search for diagnostic characters in the taxonomic literature found limited studies on the morphology of the subdivision Gymnosperms. Most often, data refer to individual species or smaller taxonomic groups. Plants are described following the APG IV classification system in divisions, classes, families, genera and species. The additional information about the plants is presented via a QR code, including information on the origin and global distribution of the species, general category of use, interesting facts.

*Keywords:* botanical garden, biodiversity, Gymnosperms *JEL Codes:* 123, L38, M14

#### REFERENCES

Abeli, T.; Dalrymple, S.; Godefroid, S.; Mondoni, A.; Müller, J.V.; Rossi, G.; Orsenigo, S. (2020) Ex situ collections and their potential for the restoration of extinct plants. Conserv. Biol. 2020, 34, 303–313.

Anderson, J. M. & Anderson, H. M. (2003). Heyday of the gymnosperms: systematics and biodiversity of the Late Triassic Molteno fructifications. Strelitzia15. SANBI, Pretoria

Beloev, H., N. Venelinova (2022) A Roadmap for Planning and Implementing the Successful Transition to Fourth Generation University: The Case of Ruse University, Bulgaria. //16th International Technology, Education and Development Conference Online Conference. 7-8 March, 2022, INTED2022 Proceedings, IATED, pp.7583-7589, ISBN:978-84-09-37758-9ISSN:2340-1079

Heywood, V.H. The future of plant conservation and the role of botanic gardens. Plant Divers. 2017, 39, 309–313.

Kuncheva, G., P. Dimitrov, H. Beloev, P. Kangalov (2022) Loss of Nutrients Through Soil Water Erosion in Calcic Chernozem // IN: Acta Technologica Agriculturae Publisher: Sciendo, pp. 113-121, DOI:10.2478/ata-2022-0018

Ma, J. (2007) A Worldwide Survey of Cultivated Metasequoia glyptostroboides Hu & Cheng (Taxodiaceae: Cupressaceae) from 1947 to 2007. Bull. Peabody Mus. Nat. Hist. 2007, 48, 235–253.

Rivers, M.; Shaw, K.; Beech, E.; Jones, M. Conserving the World's Most Threatened Trees: A Global Survey of Ex Situ Collections; BCGI: Richmond, UK, 2015; ISBN 978-1-905164-61-5.

WFO. World Flora Online. 2021. Available online: http://www.worldfloraonline.org

### FRI-1.414-MIP-01

# AN APPLICATION OF TIME SERIES FOR FORECASTING THE PRICES OF FINANCIAL INSTRUMENTS

#### Aleksandra Klimenko – Student

Department of Applied Mathematics and Statistics, University of Ruse "Angel Kanchev" E-mail: alexklimenko@abv.bg

**Pr. Assist. Prof. Vesela Mihova, PhD** Department of Applied Mathematics and Statistics, University of Ruse "Angel Kanchev" E-mail: vmicheva@uni-ruse.bg

**Abstract:** In this paper, technical analysis of 10 financial instruments is performed. Based on historical data, the standard deviations of the rates of return and the correlation matrix between them are estimated. Time series and in particular ARIMA models are considered to forecast the prices of the considered instruments.

Keywords: Time Series, ARIMA, Price Forecasting.

### REFERENCES

Burnham, K. P., Anderson, D. R. (2004). Multimodel inference: Understanding AIC and BIC in model selection. *Sociol. Methods Res.*, 33, 261-304.

Claeskens, G., Hjort, N. L. (2008). *Model Selection and Model Averaging. Technical Report.* Cambridge University Press, Cambridge, UK.

IBM SPSS Software, URL: https://www.ibm.com/analytics/spss-statistics-software (Accessed 23 September 2022).

MathWorks Website. ARIMA method, URL:

https://www.mathworks.com/help/econ/arimaclass.html?searchHighlight=arima&s\_tid=doc\_srchti tle (Accessed 20 September 2022).

Ngo, T. H. D., Bros, W. (2013). The Box-Jenkins methodology for time series models. *Proceedings of the SAS Global Forum 2013 Conference*, vol. 6, pp. 1-11.

Schwarz, G. (1978). Estimating the Dimension of a Model. Ann. Stat., 6, 461-464.

Tabachnick B., Fidell, L., Ullman, J. (2007). Using multivariate statistics. Boston.

Yahoo Finance, URL: https://finance.yahoo.com/ (Accessed 02 September 2022).

# THE BETA COEFFICIENT AS A VOLATILITY INDICATOR IN THE PORTFOLIO MANAGEMENT THEORY

#### Virginia Centeno – PhD Student

Department of Applied Mathematics and Statistics, University of Ruse "Angel Kanchev" E-mail: vcenteno@uni-ruse.bg

**Abstract:** In this paper, the volatility of a certain share is described, and the beta coefficient is introduced as a significant measurement of the market volatility. The beta coefficient is presented graphically and mathematically, and an easier formula is derived to make smoother and time-saving the process of making financial strategies. Further, the standard deviations, the rates of return and the coefficients of correlation are calculated from the data for the period 01.10.2021 - 30.09.2022. After that, the beta coefficients are calculated, and a comparison is made both Bulgarian companies – Alterco JSC and Speedy JSC.

Keywords: Beta Coefficient, Volatility, Benchmark, Asset's Return, Rate of Return, Profitability, Portfolio Management Theory, Risk.

#### REFERENCES

Bodie, Z., Kane, A., & Marcus, A. (2014). *Investments, 10<sup>th</sup> global edition*. Berkshire: McGraw-Hill Education.

Bodnar, T., Gupta, A. K.; Vitlinskyi, V., & Zabolotskyy, T. (2019). *Statistical Interference for the Beta Coefficient. Risks.*, 7, 56, DOI: https://doi.org/10.3390/risks7020056.

Bulgarian Stock Exchange, URL: https://www.bse-sofia.bg/bg/ (Accessed 01 October 2022).

Capman Holding (2016). *How to navigate which shares to invest in*. URL: https://capman.bg/blog/2016/09/29 (Accessed 02 October 2022). (*Оригинално заглавие:* Капман Холдинг, 2016, *Как да се ориентираме в кои акции да инвеситраме*).

Centeno, V., Georgiev, I., Mihova, V., & Pavlov, V. (2019). Price forecasting and risk portfolio optimization. *Application of Mathematics in Technical and Natural Sciences*, AIP Publishing, vol. 2164, pp. 060006-1-15.

Hill, R.A. (2010). Portfolio Theory & Financial Analyses. Ventus Publishing ApS, pp. 64-66.

Petrov, B. (2022). What is volatility of financial markets and how to implement it in trading? *Admiral Markets*, URL: https://admiralmarkets.com/ (Accessed 02 October 2022). (*Оригинално заглавие*: Петров, Б., 2022, Какво е волатилност на финансовите пазари и как да я използвате? *Admiral Markets*).

Рорсhev, I. (2016). Six topics in Risk Analysis. Sofia: IICT-BAS (**Оригинално заглавие:** Попчев, И. (2016). Шест теми по управление на риска. София: ИИКТ-БАН).

# METHODOLOGY FOR TRAINING TEACHERS IN INFORMATICS AND INFORMATION TECHNOLOGIES FOR IMPLEMENTING STEM EDUCATION IN SCHOOL

#### Veselina Ancheva – PhD student

Department of Informatics and Information Technologies, University of Ruse "Angel Kanchev" E-mail: vancheva@abv.bg

Assoc. Prof. Valentina Voinohovska, DSc Department of Informatics and Information Technologies, University of Ruse "Angel Kanchev" Tel.: +359 882 417 830 E-mail: vvoinohovska@uni-ruse.bg

**Abstract:** Students' skills in science, technology, engineering and mathematics (STEM) are becoming an increasingly important part of basic literacy in today's knowledge economy. The methodology described in the article is applied to Informatics and Information Technology teachers in order to train them to apply STEM education in selected elective robotics classes.

Keywords: Education, Stem, Training teachers.

### REFERENCES

DeJarnette, N. "America's children: Providing early exposure to STEM (science, technology, engineering and math) initiatives. Education," 133 (1), pp. 77-84, 2012.

Jackson, N. "A Cross-Disciplinary Conversation About Creativity In Higher Education," University of Portsmouth, p.14, 2005.

Robert, M. "STEM Project-Based Learning An Integrated Science, Technology, Engineering, and Mathematics (STEM) Approach, "SENSE PUBLISHERS, 2013.

Sujeewa, A. "STEM Teacher Education and Professional Development and Training: Challenges and Trends, "Frontiers in Cognitive Psychology, vol. 2, No. 2, pp. 61-65, 2017.

# OBSERVATION AND ASSESSMENT OF THE QUALITY OF LEARNERS' KNOWLEDGE USING MIND MAPS

#### Assoc. Prof. Svetlozar Tsankov, PhD

Department of Informatics and Information Technologies, University of Ruse "Angel Kanchev" E-mail: stsankov@uni-ruse.bg

**Abstract:** The present article examines the possibility of using electronic mind maps as a tool for quality control of students' knowledge and proposes a model for evaluating the structural component, which includes a set of methods for evaluating different aspects of the quality of training. for its practical application, an algorithm for quantitative analysis is needed, as well as the need to write down a set of evaluation criteria and a methodology for its application - the subject of an upcoming study.

Keywords: Information technologies, Mind map, Teaching, Interdisciplinary, High school.

#### REFERENCES

M. Dushkova, S. Tsankov, "Pedagogical Research on the Use of Mind Maps in Teaching Literature", EDULEARN20 Proceedings, pp. 1083-1090, 2020.

M. Dushkova, S. Tsankov, "The Use of Mind Maps in Teaching Literature with the Aid of Information Technologies", EDULEARN15 Proceedings, pp. 2720-2725, 2015.

M. Mamontova, "Electronic mind maps as a tool for assessment of the quality of students' knowledge: the possibilities and limitations of the structural information approach", 2017, Retrieved from https://core.ac.uk/download/pdf/156948443.pdf

М. Душкова, "Интерактивни методи в обучението по дисциплината 'Литература за деца и юноши'. *Учебно помагало, Русе*, 2021, с. 33-38.

S. Todorova, "Assessment of Student Knowledge. Traditional and Innovative Methods and Forms", Journal Pedagogical Almanac, Vol. 19, Issue 2, Article 3, pp 34-49, 2011, retrieved from http://journals.uni-vt.bg/getarticle.aspx?aid=1007&type=.pdf.

V. Voinohovska, S. Tsankov, "Research innovative methods for assessing competence in elearning environments", Scientific Papers of the University of Ruse, 2013, volume 52, series 6.1, pp 108-112.

Е. Н. Землянская, "Новые формы оценивания образовательных результатов студентов", Психологическая наука и образование, Т. 7. № 4. С.103-114, 2015.

И. Ю. Коцюба, А.Н. Шиков, "Автоматизированный анализ интеллект-карт учащихся, применяемых для оценки усвоения учебного материала", *Педагогическая информатика*. *Москва:* ФГНУ Институт информатизации образования РАО, Вып. 3. С. 25-31, 2014.

М. Алексиева. "Прилагане на метода на мисловните карти в обучението на студенти от хуманитарните специалности". Бургаски свободен университет. *Юбилейна научна конференция с международно участие*, с. 234-241, 2016.

T. А. Свалова, "Интеллект-карта как средство формирующего контроля знаний", 2017, Retrieved from http://elar.uspu.ru/bitstream/uspu/5636/1/03Svalova2.pdf.

Т. Бюзан, "Силата на творческата интелигентност. 10 начина да развихрим творческия си гений". *София: Изток-Запад*, 2013.

Э. Э. Карпова, Н. В, Кононенко, "Definition of Concepts Systemic and Systematicity of Knowledge in the Context of Evaluating the Quality of Training Results". Journal of Psychology. Special Pedagogy. Social Work (PSPSW), volume 55, Issue 2, pp 92-102, 2019.

# A COMPARATIVE ANALYSIS OF TEST CONTROL IN COMPUTER MODELING AND INFORMATION TECHNOLOGY TRAINING

#### Steliana Marinova – PhD Student

Department of Informatics and Information Technologies, University of Ruse "Angel Kanchev" E-mail: spmarinova@uni-ruse.bg

Assoc. Prof. Svetlozar Tsankov, PhD Department of Informatics and Information Technologies, University of Ruse "Angel Kanchev" E-mail: stsankov@uni-ruse.bg

**Abstract:** This article presents a comparative analysis of different types of test control in assessing the acquired knowledge and skills after completing the study section "Creating and processing a graphic image" of students from the junior high school stage. Emphasis is placed on Google's cloud technologies and their use in computer modeling and information technology education.

Keywords: Teaching, Test control, Assessment, Cloud technologies.

#### REFERENCES

Министерство на образованието и науката, URL: https://web.mon.bg/bg/100884, "Учебна програма по компютърно моделиране и информационни технологии за V клас (общообразователна подготовка)", РД09-2819/09.10.2020 г.

Петров В., Дженкова З., Пенчева К., Зангочева-Бакалова И., "Информационни технологии за 5. клас, Анубис", 2016.

Цанков С., Войноховска В., "Ролята на съвременните информационни образователни технологии за повишаване мотивацията на обучаемите", Научни трудове на Русенския университет, том 53, серия 11, стр.142-147, 2014.

Karakoleva, S., S. Ivanov, "Use of Cloud Technologies for Training and Test Control on the Topic 'Elements of Probabilities and Statistics' in Seventh Grade", Proceedings of Ruse University, Mathematics, Informatics and Physics, 2020, Volume 59, book 6.1, 2020. (*Оригинално заглавие:* Използване на облачни технологии за обучение и тестов контрол по темата "елементи на вероятности и статистика" в седми клас), 2020.

Council recommendation of 22 may 2018 on key competences for lifelong learning (Text with EEA relevance) (2018/C 189/01).

URL: Ucha.se (Уча.ce) онлайн платформа с уроци за училище, https://ucha.se/.

# IMPROVING THE STUDENT ASSIGNMENT GRADING SOFTWARE SYSTEM AT THE UNIVERSITY OF RUSE

Assist. Prof. Vasil Kozov, PhD Department of Informatics and Information Technology, University of Ruse "Angel Kanchev" Tel.: +359 82 888 221 E-mail: vkozov@uni-ruse.bg

**Abstract:** The paper describes the business analysis process for the assignment, covering and completion of student education system assignments, as well as parts of the process itself. The necessity for improving the process and creating a robust architecture for the management of historical data, as well as creating monitoring reports and systems for better control is analysed and realised. a critical part of the created software system - meaning its' inclusion to the whole university infrastructure, and synchronising the data flow through a secure message bus is described. The iterative approach to the creation of the system is presented, as well as some of the improvements – both technological, and those related to the logical business process evolution. Most common troubles and feedback are analysed and improved upon. The results of increasing student grade coverage, as well as the impact of introducing the system into the infrastructure are presented.

Keywords: Education, Web, Software Architecture, Databases, Business Analytics, Service Bus (RabbitMQ).

#### REFERENCES

Ionescu, Valeriu Manuel. "The analysis of the performance of RabbitMQ and ActiveMQ." In 2015 14th RoEduNet International Conference-Networking in Education and Research (RoEduNet NER), pp. 132-137. IEEE, 2015.

Rostanski, Maciej, Krzysztof Grochla, and Aleksander Seman. "Evaluation of highly available and fault-tolerant middleware clustered architectures using RabbitMQ." In 2014 federated conference on computer science and information systems, pp. 879-884. IEEE, 2014.

Haigh, Maria. "Software quality, non-functional software requirements and IT-business alignment." Software Quality Journal 18, no. 3 (2010): 361-385.

Garcia, Joshua, Mehdi Mirakhorli, Lu Xiao, Yutong Zhao, Ibrahim Mujhid, Khoi Pham, Ahmet Okutan et al. "Constructing a shared infrastructure for software architecture analysis and maintenance." In 2021 IEEE 18th International Conference on Software Architecture (ICSA), pp. 150-161. IEEE, 2021.

Al-Saqqa, Samar, Samer Sawalha, and Hiba AbdelNabi. "Agile Software Development: Methodologies and Trends." International Journal of Interactive Mobile Technologies 14, no. 11 (2020).

Hoda, Rashina, Norsaremah Salleh, and John Grundy. "The rise and evolution of agile software development." IEEE software 35, no. 5 (2018): 58-63.

Tam, Carlos, Eduardo Jóia da Costa Moura, Tiago Oliveira, and João Varajão. "The factors influencing the success of on-going agile software development projects." International Journal of Project Management 38, no. 3 (2020): 165-176.

Gulson, Kalervo N., and Sam Sellar. "Emerging data infrastructures and the new topologies of education policy." Environment and Planning D: Society and Space 37, no. 2 (2019): 350-366.

### FRI-2G.305-PP

### FRI-2G.305-PP-01

# PROSPECTS BEFORE FULL FUNCTIONING OF AUTODIDACTIC GAME IN KINDERGARDEN

Assoc. Prof. Asya Veleva, PhD Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: 082 888 268 E-mail: aveleva@uni-ruse.bg

**Abstract:** Play and games are important for child's development. They occupy a significant place in preschool education programs. However often in pedagogical practice teachers offer to children didactic exercises instead of games. Especially when it comes to autodidactic games. The aim of current paper is to offer perspectives before full functioning of autodidactic game in kindergarten. Therefore, there are analyzed essential characteristics of autodidactic game, namely: victory, variability, imaginary situation, game signaling. their presence in the gameplay will enhance its educational and developmental effect.

Keywords: Children Game, Autodidactic Game, Essential Characteristics of Autodidactic Game.

#### REFERENCES

Dimitrov, D. (1985). Problemi na igrata v preduchilishtna vazrast. [Uchebno pomagalo]. Blagoevgrad: Pechatna baza pri YuZU "Neofit Rilski". (**Оригинално заглавие:** Димитров, Д. (1985). Проблеми на играта в предучилищна възраст. [Учебно помагало]. Благоевград: Печатна база при ЮЗУ "Неофит Рилски").

Fabri. K. (1999) Osnovy zoopsikhologii. 3-e izdanie Moskva: Rossiyskoe psikhologicheskoe obshchestvo. (**Оригинално заглавие:** Фабри, К. (1999) Основы зоопсихологии. 3-е издание Москва: Российское психологическое общество).

Нуоуzinha, Ү. (2000). *Homo Ludens*. Sofia: Zahariy Stoyanov. (*Оригинално заглавие*: *Хьойзинха, Й. (2000). Homo Ludens*. София: Захарий Стоянов).

Ilieva, Zh. (2020). Vazmozhnostite na igrata kato metod na interkulturnoto obrazovanie v nachalnoto uchilishte. Pedagogicheski novosti, №1, 74-81. (*Оригинално заглавие:* Илиева, Ж. (2020). Възможностите на играта като метод на интеркултурното образование в началното училище. Педагогически новости, №1, 74-81).

Мihaylenko N., Korotkova, N. (2002). Igra s pravilami v doshkolynom vozraste. – 4-e izd. -Moskva: Akademicheskiy Proekt. (**Оригинално заглавие:** Михайленко Н., Короткова, Н. (2002). Игра с правилами в дошкольном возрасте. – 4-е изд. - Москва: Академический Проект).

Могоzov I.A. (2001). "Igra" i "ritual" v sovremennom nauchnom diskurse. Traditsionnaya kultura. Nauchnyy almanakh. - 1. 20-28. (**Оригинално заглавие:** Морозов И.А. (2001). "Игра" и "ритуал" в современном научном дискурсе. Традиционная культура. Научный альманах, - 1, 20-28).

Steen, F. & S. Owens. (2001). Evolution's Pedagogy: An Adaptationist Model of Pretense and Entertainment. *Journal of Cognition and Culture*, - 1.(4), 289-321.

#### FRI-2G.305-PP-02

# KNOWLEDGE OF CHILDREN'S RIGHTS THROUGH THE EYES OF STUDENT TEACHERS

Assoc. Prof. Bagryana Ilieva, PhD Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: 082/888 260 E-mail: bilieva@uni-ruse.bg

Abstract: from kindergarten to high school graduation, children study topics related to knowledge of children's rights as set out in the United Nations Convention on the Rights of the Child. to a large extent, knowledge about rights is accumulated at every stage of the school period, and its provision is woven into various academic disciplines. Teachers inform about children's rights, as they are obliged by Ordinance No. 13 of 21.09.2016 on civic, health, environmental and intercultural education to form consciousness and virtues in children; to create individuals who understand and uphold common human values.

This report presents the results of a survey conducted among 2nd-year students, majoring in Social Pedagogy, Elementary School Pedagogy with a Foreign Language, and Preschool and Elementary School Pedagogy about the motivation for studying the subject Rights of the Child, part of the curriculum for the OKS Bachelor and the need to knowledge of children's rights. Questions related to knowledge received in secondary education, as well as ways of providing it, are discussed.

Keywords: children, child rights, issues, convention.

#### REFERENCES

The Universal Declaration of Human Rights. (*Оригинално заглавие*: *Всеобщата* декларация за правата на човека, https://www.cpdp.bg/?p=element&aid=32).

Convention on the Rights of the Child, https://www.unicef.org, (6.03.2021г.). (*Оригинално* заглавие: Конвенция за правата на детето, достъпна от - https://www.unicef.org).

Ordinance №13/2016 g. na MON, (DV, br. 80/ 2016 g., izm. DV, br. 80/ 28.09.2018 (**Оригинално заглавие**: Наредба №13/2016 г. на МОН, (ДВ, бр. 80/ 2016 г., изм. ДВ, бр. 80/ 28.09.2018), https://www.mon.bg/bg/59).

Dimitrov, I., Ethnocultural environment and psychosocial development. Izd. Na SU "Sv. Kliment Ohritski", 2010. (*Оригинално заглавие:* Димитров, И. Етнокултурна среда и психосоциално развитие. Изд. на СУ "Св. Климент Охридски", 2010).

Ombudsman of the Republic of Bulgaria, "Rights of the Child", Sofia,2017r. https://www.ombudsman.bg/pictures/%D0%9F%D1%80%D0%B0%D0%B2%D0%B0%20%D0

%BD%D0%B0%20%D0%B4%D0%B5%D1%82%D0%B5%D1%82%D0%BE.pdf (8.04.2021г.), (**Оригинално заглавие**: Омбудсман на Република България, "Правата на детето", София, 2017г.

https://www.ombudsman.bg/pictures/%D0%9F%D1%80%D0%B0%D0%B2%D0%B0%20%D0% BD%D0%B0%20%D0%B4%D0%B5%D1%82%D0%B5%D1%82%D0%BE.pdf).

Radoslavova, L.(2019) Development of emotional intelligence through the learning process in primary school age. In: "Optimization of educational strategies for regulating emotions and feelings in education and the socio-pedagogical sphere", NSF: 19-FPNO-02,2019, ISBN: 978-619-207-183-7) (**Оригинално заглавие**: Радославова, Л., (2019). Развитие на емоционалната интелигентност чрез процесът на обучение в начална училищна възраст. В: "Оптимизиране на възпитателните стратегии за регуиране на емоции и чувства в образованието и социално-педагогическата сфера", ФНИ: 19-ФПНО-02, , ISBN: 978-619-207-183-7).

Ilieva, B., D. Spasova. SOCIAL-PEDAGOGICAL SUPPORT FOR THE ELDERLY AND THE ELDERLY THROUGH SOCIAL SERVICES IN THE COMMUNITY - NEED AND

СНАLLENGE. PROCEEDINGS Volume 59, book 6.5 Pedagogy and Psychology. ISBN: 1311-3321. (*Оригинално заглавие:* Илиева, Б., Д. Спасова. Социална-педагогическа подкрепа за лица в напреднала и старческа възраст чрез социални услуги в общността – необходимост и предизвикателства. В: сб. 59-ма Научна конференция на Русенски университет "Ангел Кънчев"- "Нови индустрии, дигитална икономика, общество – проекции на бъдещето III", 2020. Стр.17-22, ISSN 2603-4123 (on-line).

Staneva, Y., Kriterii za rezilians pri rodditeli v risk ot razdjla s detsata im (izsledvane na slychaj), sp. Pedagogika, kn.7, Sofij, 2017. (**Оригинално заглавие**: Станева, Я., Критерии за резилианс при родители в риск от раздяла с децата им (изследване на случай), сп. Педагогика, книга 7, София, 2017).

Tselova, A., Evaluation of the functionality of the system for the protection of children at risk in the Republic of Bulgaria (Rezultati ot empirichno izsledvane-El. Spisanie "i-Prodaljavasho obrazovanie" SU "Sv. Kl. Oxritski", 2019, ISSN 1312-899X –https://diuu.bg/emag/8599/ (**Оригинално заглавие**: Целова, А., Оценка на функционалността на системата за закрила на деца в риск в Република България (Резултати от емпирично изследване) – Ел. списание "i-Продължаващо образование", СУ "Св. Климент Охридски", Департамент за информация и усъвършенстване на учители, 2019, ISSN 1312-899X –https://diuu.bg/emag/8599).

Totseva, Ya. Professional-pedagogical and intercultural communicative competence. V: sb.: Tehnologichni aspekti na interkulturnoto obrazovanie, Blagoevgrad, 2009, str. 40-49, http://ytotseva.blogspot.com/2009/06/blog-post\_3353.html (*Оригинално заглавие*: *Тоцева, Я.* Професионално-педагогическа и интеркултурна комуникативна компетентност. В: сб.: Технологични аспекти на интеркултурното образование, Благоевград, 2009, стр. 40-49, http://ytotseva.blogspot.com/2009/06/blog-post\_3353.html (Accessed on 3.09.2022).

Vasileva, V., 2017. Active forms and methods in adult education. In: Project of the Department of Pedagogy, Psychology and History 17-FPNO-02, "Design and implementation of developing complexes of creative tasks to increase the creativity of learners" Ed. Primax ISBN: 978-619-7242-31-7 pp. 104-10 (**Оригинално заглавие:** Василева, В., 2017. Активни форми и методи при обучение на възрастни. Сб. Проект на катедра ППИ 17-ФПНО-02, "Проектиране и реализиране на развиващи комплекси от творчески задачи за повишаване креативността на учащите" Изд. Primax ISBN: 978-619-7242-31-7 с. 104-109).

### FRI-2G.305-PP-03

# PRINCIPLES AND METHODS OF DISTANCE EDUCATION OF ADULT LEARNERS

Assoc. Prof. Valentina Vasileva, PhD Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: 082/888268 E-mail: vvasileva@uni-ruse.bg

**Abstract:** The paper reviews the adult education as an important element of lifelong learning. Lifelong learning is a concept that represents the continuity of the learning and education process and refers to a range of formal and non-formal learning activities, both general and vocational, undertaken by adults after completing initial education and training.

Adults seek training for a variety of reasons: to improve their employment prospects; to develop personally or professionally; to acquire advanced 'transversal skills' such as critical thinking and problem-solving skills; to improve social cohesion and promote active citizenship.

The pandemic and the digital transition have accelerated lifestyle changes, which in turn require people to update their knowledge, skills and competences to fill the gap between their education and training and the demands of a rapidly changing job market.

Keywords: E-Learning, Knowledge, Skills, Adult learners.

#### REFERENCES

Doncheva, Yu. 2013. Analysis of the expiring program period and the expectations of beneficiaries, users of projects in the field of education, during the new program period 2014-2020. In: SCIENTIFIC PAPERS OF THE UNIVERSITY OF RUSE, volume 52, series 6.2. (*Оригинално заглавие:* Дончева, Ю. 2013. Анализ на изтичащия програмен период и очакванията на бенефициентите, потребители на проекти в сферата на образованието, през новия програмен период 2014 – 2020 година. В: НАУЧНИ ТРУДОВЕ НА РУСЕНСКИЯ УНИВЕРСИТЕТ, том 52, серия 6.2.) URL: https://conf.uni-ruse.bg/bg/docs/cp13/6.2/6.2-22.pdf). (Accessed on 11.09.2022).

Zmeev S.I. 2002. Technology of adult education. Moscow: Publishing Center "Academia" (**Оригинално заглавие**: Змеев С.И. 2002. Технология обучения взрослых. Москва: Издательский центр "Академия").

Ilieva, B. 2014. Use of interactive methods in the course "Social work for adults and disabled people", Ruse: Ruse University "Angel Kanchev".

Меthodological guide for adult education (2006). Project under the program ``PHAR 2003 BG 2003/004-937.05.03 "Professional qualification" EuropeAid/120163/D/SV/BG (*Оригинално* заглавие: Илиева, Б. 2014. Използване на интерактивни методи в учебната дисциплина "Социална работа при възрастни и инвалиди", Русе: Русенски университет "Ангел Кънчев").

Меthodological guide for adult education . 2006. Project under the program ``PHAR 2003 BG 2003/004-937.05.03 "Professional qualification" EuropeAid/120163/D/SV/BG ( *Оригинално* заглавие: Методическо ръководство за обучение на възрастни (2006). Проект по програма `ФАР 2003 BG 2003/004-937.05.03 "Професионална квалификация"

*EuropeAid/120163/D/SV/BG*), URL: http://lll.mon.bg/uploaded\_files/Adult\_education1.pdf). (Accessed on 21.09.2022).

Council Resolution on a new European Agenda for Adult Learning 2021-2030 (2021/С 504/02) Official Journal of the European Union 14.12.2021 (*Оригинално заглавие: Резолюция на* Съвета относно нова европейска програма за учене за възрастни за периода 2021 – 2030 г.
(2021/С 504/02) Официален вестник на Европейския съюз 14.12.2021). URL: https://eurlex.europa.eu/legal-content/BG/TXT/HTML/?uri=CELEX:32021G1214(01). (Accessed on 21.09.2022).

The strategic framework for the development of education, training and learning in the Republic of Bulgaria (2021 - 2030). (*Оригинално заглавие: Стратегическата рамка за развитие на образованието, обучението и ученето в Република България (2021 - 2030)*), URL: https://web.mon.bg/bg/143). (Accessed on 21.09.2022).

Spasova, D. 2021. APPLICATION OF TRAINING IN HIGH-TECH FACILITIES FOR SUPPLEMENTARY AND ALTERNATIVE COMMUNICATION FOR STUDENTS FROM SUPPORTING PROFESSIONS. PROCEEDINGS OF UNIVERSITY OF RUSE, volume 60, book 6.2. URL:https://conf.uni-ruse.bg/bg/docs/cp21/6.2/6.2-frontMatter.pdf). (Accessed on 24.08.2022).

Наѕиеv, А.Е. 2019. FEATURES OF DISTANCE EDUCATION OF ADULTS, "Peace of science, culture, education". No. 6 (79), Gorno-Altaysk . (*Оригинално заглавие: Хасуев, А.Э. 2019. ОСОБЕННОСТИ ДИСТАНЦИОННОГО ОБУЧЕНИЯ ВЗРОСЛЫХ ЛЮДЕЙ, "Мир науки, культуры, образования".* № 6 (79), Горно-Алтайск), URL: http:// amnko.ru/index.php/russian/journals/ (Accessed on 24.08.2022).

Michael Grahame Moore, William Anderson, 2003. Handbook of distance education

URL:https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.452.2439&rep=rep1&type =pdf) (Accessed on 21.09.2022).

Knowles M., Holton III. E., Swanson, E.(2005). The adult learner : the definitive classic in adult education and human resource development. Oxford: Elsevier Inc.

Recommendation on Adult Learning and Education, (2015). URL: https://unesdoc.unesco.org/ark:/48223/pf0000245179 (Accessed on 11.09.2022).

# TRAINING AND PROFESSIONAL SUPPORT FOR SOCIAL ASSISTANTS PROVIDING CARE AT HOME

#### Dima Spasova – PhD Student

Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: +359 887 660 611 E-mail: dspasova@uni-ruse.bg

Abstract: The global population ageing rate is much faster than in the past. People around the world, today, are living longer. Every country in the world is seeing an increase in both the number and proportion of older people. Countries face major challenges to ensure that health and social systems are ready to cope with this demographic change. Home care is at the heart of this, allowing people to age in place and keep their families intact. The challenge for professionals is to find ways to respond to the coming crisis by providing high quality care in the home environment. At the heart of home-based care is an understanding of the needs of consumers on the one hand and carers on the other. Social assistants provide a variety of services to users beyond direct care activities. Services include family support, consumer counselling, listening, crisis intervention and much more. Working as a social assistant requires a lot of training and support from different professionals all the time. But are they getting that training and that professional support?

Keywords: Home care, social assistants, training, professional support.

# REFERENCES

Vasileva, V. (2015). Value orientation of the elderly as a factor in their social self-esteem and social adaptation. "Mircea cel Batran" Naval Academy Scientitic Bulletin, Volume XVIII, 386-387.

Ilieva, B. (2014). The care trends in elderly population. 9th International Balkans Education and Science Conference- Trakya University, Edirne, Turkey.

# URL:

https://www.lex.bg/bg/laws/ldoc/2137191914. (Accessed on 28.09.2022).

https://www.lex.bg/bg/mobile/ldoc/2137223813. (Accessed on 28.09.2022).

https://www.mlsp.government.bg/eng/social-services-at-home (Accessed on 28.09.2022).

http://www.icss-bg.org/wp-content/uploads/2015/07/SA\_Handbook.pdf. (Accessed on 26.09. 2022).

# PRINCIPLES FOR CONSTRUCTING AND APPLYING MICRO-LEARNING TECHNOLOGY IN THE DISTANCE TYPE OF EDUCATIONAL INTERACTION

Assoc. Prof. Desislava Vasileva Stoyanova, PhD Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: 082 888 268 E-mail: dstoyanova@uni-ruse.bg

**Abstract:** The report is devoted to the analysis of the transformation of education under the influence of the process of digitization of society. The development of new information and communication technologies leads to the need to modify the digital educational environment. There is a need to improve training methods and approaches. Therefore, it is particularly important to improve the methods and approaches to training by constructing and testing training programs based on the current concepts of the individualization and differentiation of the didactic process. World practice shows that one of the particularly effective approaches in this direction is the use of modular training and, in particular, micro-learning as a phenomenon of the digital transformation of education. Microlearning is an aspect of the concept of modular personalized pedagogical interaction and is perceived as an innovative educational format of programmed learning. The report describes the essence of this current trend in the field of application of distance learning, an analysis of the advantages, disadvantages, areas of application and tools for creating effective educational resources based on the possibilities of microlearning is made.

*Keywords:* Innovative educational technologies, Distance learning, Interactivity, Micro-training, Micro-course, Micro-employment, Digitalization, Digital transformation.

# REFERENCES

Bersin J., 2014. Meet the Modern Learner: Engaging the Overwhelmed, Distracted, and Impatient Employee.

Hug, T., 2007. *Didactics of microlearning.* Concepts, Discourses and Examples. Waxmann Verlag, ISBN, 3830918690, 9783830918691, p. 424.

Javorcik, T., Polasek, R., 2019. *Practical application of microlearning in education of future teachers*. ECEL 2019 18th European Conference on e-Learning, Copenhagen, p. 254-259 ISSN:2048-8645.

Jomah, O., Masoud, A., Kishore, X., Aurelia, S., 2016. *Micro Learning: a Modernized Education System*. BRAIN. Broad Research in Artificial Intelligence and Neuroscience, Vol 7, No 1, 103. URL: https://www.brain.edusoft.ro/index.php/brain/article/view/582/627 (Accessed on 28.08.2022).

Мопаhova, G., Monahov, D., Pronchev, G., 2020. *Microlearning as a phenomenon of digital* transformation of education. In: Education and Law, No.6, p.299-304 DOI 10.24411/2076-1503-2020-10645 (**Оригинално заглавие:** Монахова, Г., Монахов, Д., Прончев, Г., 2020. Микрообучение как феномен цифровой трансформации образования. В:сп. Образование и право,  $N_{0}6$ , c.299-304 DOI 10.24411/2076-1503-2020-10645).

Vasileva, V., 2017. Active forms and methods in adult education. In: Project of the Department of Pedagogy, Psychology and History 17-FPNO-02, "Design and implementation of developing complexes of creative tasks to increase the creativity of learners" Ed. Primax ISBN: 978-619-7242-31-7 pp. 104-10 (**Оригинално заглавие:** Василева, В., 2017. Активни форми и методи при обучение на възрастни. Сб. Проект на катедра ППИ 17-ФПНО-02, "Проектиране и реализиране на развиващи комплекси от творчески задачи за повишаване креативността на учащите" Изд. Primax ISBN: 978-619-7242-31-7 с. 104-109).

# PEDAGOGICAL INTERACTIONS FOR SENSORY DEVELOPMENT IN PRESCHOOL CHILDREN

#### Prof. Julia Doncheva, DcS

Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: +359 082/888 544 E-mail: jdoncheva@uni-ruse.bg

## Prof. Dr. Fatima Rahim Abdul Hussein

English Department, Basic Education College, University of Misan, Iraq Tel.: 009647705548665 E-mail: f.iq777@uomisan.edu.iq

## Prof. Dr Liqaa Habeb Al-Obaydi

English Department, College of Education for Human Science, University of Diyala, Iraq Tel.: 009647727413239 E-mail: liqaa.en.hum@uodiyala.edu.iq

**Abstract:** Sensory education is a system of pedagogical interactions aimed at forming the ways of sensory cognition and improving sensory processes, i.e. formation of methods for sensory knowledge and improvement of sensation and perception. Preschool age is the most favorable period for intensive sensory development and upbringing of adolescents. The general level of sensory education and development at this age depends on the inclusion of the child in learning about the surrounding world.

The authors emphasize the exceptional role of sensory education at this age, as a foundation for all other types of training and activities, as well as for successful socialization, which in turn begins precisely from this age period. The report presents effective forms, methods and resources for developing the sensory skills of children of preschool age, through a system of pedagogical interactions aimed at forming the ways of sensory cognition and improving sensory processes, i.e. formation of methods for sensory knowledge and improvement of sensation and perception.

Keywords: Sensory, Effectiveness, Pedagogycal Methods, Model, Preschoole Education's, social and cognitive skills.

# REFERENCES

Alexandrache, C. (2014). Differentiated Education in the Service of Preventing/Reducing the School Conflict. Procedia - Social and Behavioral Sciences, 159(23), 433-43.

Al-Obaydi, L. H., Doncheva, J., & Nashruddin, N. (2021). EFL College Students' Self-esteem and its Correlation to their Attitudes towards Inclusive Education. Воспитание/Vospitanie-*Journal of Educational Sciences, Theory and Practice*, 16(1), 27-34.

Al-Obaydi, L. H., Jawad, Z. A. & Rahman, F. (2022). Class-home Connection Using Communication Technology and its Impact on Anxiety Reduction and Academic Performance. *Al-Adab Journal* – (1) Vol. (141) P. 53-66. DOI: https://doi.org/10.31973/aj.v1i141.3615.

Budakova, S. (2018). Scientific documentation and research of folklor in Shumen region. SocioBrains, Issue 45, May 2018, ISSN 2367-5721, c. 221-227.

Dineva, V., (2012). Application of Solution Focused Brief Therapy at psychoactive substance addiction. In: *Contemporary problems of the humanities and natural sciences, Moscow*, pp. 291-296.

Eyubova, S., (2020). The Personal Experience in Forming of Competencies in the University Education of the Students in Pedagogical Majors. In: SocioBrains, International scientific refereed online journal with IF: www.sociobrains.com, Issue 72, August 2020, ISSN 2367 – 5721, pp.52-57.

Garvalova, M., (2022). Relationship between Internet addiction and life satisfaction among students in the conditions of COVID-19. In: Conference: INTED2022 Proceedings. 16th Annual International Technology, Education and Development Conference – INTED2022, 7-8 March 2022, Valencia, Spain, Virtual Conference. IATED Academy, pp. 5227-5231, ISBN 978-84-09-37758-9, ISSN 2340-1079.

Georgieva, E., E. Dragolova (2000) The Sensory education according to the method of M. Montessori. Theoretical and practical manual for preschool age (*Оригинално заглавие: Георгиева, Е., Е. Драголова (2020) Сензорното възпитание по метода на М. Монтесори.* Теоретико-приложно пособие за предучилищна възраст. Изд. Диамат, гр. Ямбол).

Ivanova, B., (2018). Modern learning technologies for the development of students' functional literacy, In: collection of the International Scientific Conference "Pedagogical Education - Traditions and Modernity", Publishing House "Ayand B", pp. 350-358. (*Оригинално заглавие*: Иванова, Б. (2018). Съвременни технологии на обучение за развитие на функционалната грамотност на учениците, сборник от Международна научна конференция ,,Педагогическото образование – традиции и съвременност'', Издателство "Айанд Би", 2018, стр. 350-358, ISSN: 2534-9317).

Ivanova, E. (2017). Formation of the creative potential of the child from early childhood through multimedia and multimedia applications, In: *Design and implementation of developing complexes of creative tasks to increase the creativity of students*, Ruse, ISBN: 978-619-7242-32-4, (*Оригинално заглавие:* Иванова, Е. (2017). Формиране на творческия потенциал на детето от ранна детска възраст чрез мултимедия и мултимедийни приложения, В: *Проектиране и реализиране на развиващи комплекси от творчески задачи за повишаване креативността на учащите*, Русе, ISBN: 978-619-7242-32-4).

Jordanov, V., (2020). Model for Conducting Effective Training in Folk Dances for School Students. *Publisher Sociocracies*': Journal homepage: www.sociobrains.com.

Копаксhieva, Р., (2016). Journey to Others: Cultivating Socialcompetency in Childhood through Interactivemodel Technologies. In: Pedagogical Almanach, Volume 2, pp. 192 -200. (Оригинално заглавие: Конакчиева, П., 2016. Пътуване към другите: Възпитаване на социална компетентност в детството чрез интерактивни моделни технологии. В: Педагогически алманах, кн. 2, сс. 192 – 200, В. Търново).

Krasteva, N., (2020). Social and Civic Skills of 5-7 -year-old Children in the "Surrounding world", In: TIJER Volume 2 / Issue 2 / Page: 1-11, December 2020.

Mihaylova, R. (2021). Dynamics of the competitive environment in social work education on the background of the national market of educational services, pp. 77-81, Issue 77, January 2021, ISSN 2367-5721 (online), www.sociobrains.com, Publ.: Smart Ideas - Wise Decisions Ltd., Bulgaria, 2021, (SJIF = 5.985).

Mincheva, R., (2020). Social Work with Children with Deviant Behavior // SocioBrains, Issue 73, September 2020, pp. 58-71, ISSN 2367-5721 (online), www.sociobrains.com, Publ.: Smart Ideas – Wise Decisions, Ltd., Bulgaria.

Neminska, R., (2015). Methods of Interdisciplinary Learning. Bulgarian Journal of Education, Volume 2. https://www.elbook.eu/images/9\_Rumiana\_Neminska.pdf (*Оригинално заглавие: Неминска, Р. Методи на интердисциплиинарно обучение*. Българско списание за образование, брой 2, 2015, https://www.elbook.eu/images/9\_Rumiana\_Neminska.pdf.)

Nikolova, Yo., (2018). The Rights of the Child from the Viewpoint of Student Teachers, In: Pedagogy Volume 90, Number 9, (*Оригинално заглавие: Николова, Йо., Правата на детето през погледа на студенти педагози,* сп. Педагогика, Volume 90, Number 9, 2018).

Nikolova, Yo., (2021). Modern Approaches to Raising the Pedagogical Culture of Parents in an Informal Environment. In: 'Obrazovanie i tehnologii' Annual sciences – methodological journal, 12/2021, issue 1, Burgas. (*Оригинално заглавие: Съвременни подходи за повишаване педагогическата култура на родителите в неформална среда*, Бургас сп. "Образование и технологии", годишно научно-методическо списание, vol. 12/2021, 1).

Petrova, E., (2020). Analysis and Short Presentation of Study on Motivational Salience and Satisfaction with Training in the Field of Security and Defence. In: *Defence Science Review*, No. 10, 2020, DOI: 10.37055/pno/133845, http://www.defencesciencereview.com.pl/.

Rahim, Abdul Hussein Al-Mosawi, Fatima (2018). Finger Family Collection YouTube Videos Nursery Rhymes Impact on Iraqi EFL Pupils' Performance in Speaking Skills. In: Revista de Ciencias Humanasy Sociales. Universidad del Zulia Facultad Experimental de Ciencias Depatramento de Ciencias Humanas, Maracaibo – Venezuela, Opción, Año 34, Especial No.17 (2018): 452-474.

Sotirov, Ch., (2015). Supportive Environment for Children with Special Educational Needs. SocioBrains - international scientific online journal publisher: www.sociobrains.com, ISSUE 8, November, 2015, pp. 51-55; ISSN 2367-5721.

Sulichka, I. (2021). The Competence Approach in STEM Educational Environment of the Primary School. In: Create and Explore on STEALM Centers in Education and the Social-Pedagogical Sphere. PRIMAX, ISBN 978-619-7242-91-1, pp. 103-122.

Tileva, A. (2018) Creative and innovative learning based on digital materials and games, Collection of reports from the Regional Pedagogical Conference "Children and Education of the XXI Century" с. 252-255, Diagon 88, Pazardzhik, ISBN 978-619-7414-10-3 (*Оригинално заглавие:* Тилева, А. (2018) Творческо и иновативно обучение, базирано на дигитални материали и игри, Сборник с доклади от Областна педагогическа конференция "Децата и образованието на XXI век" с. 252-255, Диагон 88, Пазарджик, ISBN 978-619-7414-10-3).

Tileva, A. (2022). Assessment of the Digital Competencies of Preschool teachers in Bulgaria. In: Science and society: Collection of scientific articles. - Fadette editions, Namur, Belgium, ISBN 978-2-5494-0322-4 pp. 95-100.

Valchev, K., (2017). State of Human Capital Format in the in the Field of Higher Education in Bulgaria. In: *Proceedings of University of Ruse* - 2017, volume 56, book 9, 2017.

Velcheva, K., (2017) Portfolio for Graphic Culture Formation - Alternative Form of Evaluation, In: Scientific Journal Impact Factor Issue 39, November 2017, The November Issue of SocioBrains reflects the scientific Faculty of Konstantin Preslavsky - University of Shumen, Shumen, Bulgaria, presented at Scientific Conference "Innovation in Education" (27-29 October 2017) (204-210); Factor for 2016=4.922; ISSN 2367-5721, www.SocioBrains.comImpact.

Voinohovska, V., Julia Doncheva (2022). Integration of Information and communication technologies in educational theory and practice. In: Proceedings of INTED2022 Conference, 2022, pp. 0452 - 0458, ISBN 978-84-09-37758-9.

# EXTRACURRICULAR ACTIVITIES IN BULGARIA - A CONDITION FOR THE FORMATION OF STEM SKILLS AND COMPETENCIES IN THE PUPILS

**Ch. Assist. Prof. Ekaterina Ivanova, PhD** Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: +359 897212775 E-mail: eivanova@uni-ruse.bg

**Abstract:** The publication describes the interaction of leisure institutions. An analysis of national normative documents is carried out, which indicates the methodology for the selection and implementation of extracurricular activities, which take place as a priority in thematic areas of the main STEM fields – 'Digital creativity', 'Natural sciences', 'Mathematics', 'Technologies'. Participation in them supports the development of students' key competencies in mathematics, informatics, natural sciences, and technology while supporting their professional orientation.

Keywords: extracurricular activities, STEM, key competencies, primary school.

## REFERENCES

Dimitrova, Z. 2015. Extracurricular forms of training in physical education and sports for children of primary school age, *Collection of scientific works Ruse University 'Angel Kanchev'* (**Оригинално заглавие:** Димитрова, 3., 2015. Извънкласни форми на обучение по физическо възпитание и спорт за деца от начална училищна възраст, Сборник научни трудове Русенски университет "Ангел Кънчев").

Zhiryakova, P., 1988. The educational work of out-of-school institutions. S. MKNP (**Оригинално заглавие:** Жирякова, П., 1988. Възпитателната работа на извънучилищните учреждения. С. МКНП).

Коzuharova, D., 2020. from digital competence to digital creativity, St. Zagora (*Оригинално* заглавие: Кожухарова, Д., 2020. От дигитална компетентност към дигитална креативност, Ст. Загора).

National calendar of performances in the interests of children and students, URL: https://www.mon.bg/, 20.06.2022.

Ordinance No. 13 of 21.09.2016 on civic, health, environmental and intercultural education, URL - https://www.mon.bg/, 20.06.2022.

Popov, A., 1994. Extracurricular and extracurricular activities with students. Blagoevgrad (**Оригинално заглавие:** Попов, А., 1994. Извънкласната и извънучилищната дейност с учениците. Благоевград).

Sotirov, Ch., 2016. Tourist practices in school. Collection of reports Shumen University (**Оригинално заглавие:** Сотиров, Ч., 2016. Туристически практики в училище. Сборник доклади Шуменски университет).

Todorova, L., 1993. Theory and methodology of extracurricular educational activities with elementary school students: Help for elementary teachers and educators. Blagoevgrad (*Оригинално заглавие:* Тодорова, Л., 1993. Теория и методика на извънкласната и извънучилищната възпитателна дейност с учениците от началните класове: Помагало за начални учители и възпитатели. Благоевград).

Tsvetkov, B., 2013. Forms of extracurricular and extracurricular activities for youth: Youth in Action program, In Sofia University Journal of Educational Research (*Оригинално заглавие:* Цветков, Б., 2013. Форми за извънкласни и извънучилищни дейности за младежи: програма "Младежта в действие", В: Списание на Софийския университет за образователни изследвания).

# FUNCTIONS AND PRINCIPLES OF DIDACTIC ANIMATION IN THE EDUCATION OF PRIMARY SCHOOL STUDENTS

#### Zhivka Ilieva, Phd student

Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: 0889923139 E- mail: zhilieva@uni-ruse.bg

**Abstract:** Didactic animation is a relatively new approach that is gaining more and more popularity in pedagogical theory and practice. It is appropriate for its use in teaching primary school students, who at this age need joyful experiences related to both learning and play, which is still a desirable and important activity in their daily lives. The fun, curiosity, fun and attractiveness accompanying the animation approach increase the motivation of students to do academic work, attract their attention and inspire them. As a result, adolescents are casually and actively involved in educational and cognitive activities. The successful application of didactic animation in the learning process in primary school depends to a large extent on getting to know its functions and guiding principles. Therefore, the main purpose of this report is to reveal the functions and principles of didactic animation. They are derived as a result of approved lessons in the education of Bulgarian language and literature students in the second grade, based on the animation approach.

Keywords: didactic animation, animation approach, functions, principles, learning, elementary school.

# DIGITAL PLATFORMS AND MOBILE APPLICATIONS FOR PHYSICAL AND SPORTS ACTIVITY

#### Assoc. Prof. Iskra Ilieva, PhD

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

**Abstract:** The use of mobile apps and digital platforms to track physical activity and sports activities was introduced even before the COVID epidemic. But the period of forced isolation had its impact on the need to improve electronic means and forms.

Specialized platforms for learning, training, teaching and refereeing have been introduced in different sports. with the improvement of motor and technical-tactical skills, software programs are created and improved.

In this report, we will present a comparative analysis of mobile applications and digital platforms for some types of sports.

**Keywords:** Comparative Analysis, Digital Platforms, Mobile Applications, Fitness and Exercise Apps, Physical Activity, Sports.

#### REFERENCES

Aitken M, Clancy B, Nass D. IQVIA. (2017). The Growing Value of Digital Health: Evidence and Impact on Human Health and the Healthcare System

https://www.iqvia.com/institute/reports/the-growing-value-of-digital-health webcite.

Bichi, A. (2017) Opportunities brought by innovation and digital technologies in sport, https://sport.ec.europa.eu/sites/default/files/docs/docs/eusf-data-1\_en.pdf.

Payne HE, Lister C, West JH, Bernhardt JM. Behavioral functionality of mobile apps in health interventions: a systematic review of the literature. JMIR Mhealth Uhealth. 2015 Feb 26;3(1):e20. doi: 10.2196/mhealth.3335. http://mhealth.jmir.org/2015/1/e20/ [PMC free article] [PubMed] [CrossRef] [Google Scholar].

Yu, F., & Conway, A. R. (2012). Mobile/smartphone use in higher education.

Jasmine Maria Petersen, Ivanka Prichard, Eva Kemps, a Comparison of Physical Activity Mobile Apps with and Without Existing Web-Based Social Networking Platforms: Systematic Review, Originally published in the Journal of Medical Internet Research (http://www.jmir.org), 16.08.2019.

STEFANI SASSOS, M.S., R.D.N., C.S.O., C.D.N. AND OLIVIA LIPSKI (2022) 15 Best Workout Apps to Download in 2022, According to Fitness Experts,

https://www.goodhousekeeping.com/health-products/g27112869/best-workout-apps/.

Zdravkov, L., G. Ivanova, Al. Ivanov, (2021) Virtual and Augmented Reality for Educational Purposes in the Field of Mechanical Engineering IN:PROCEEDINGS OF UNIVERSITY OF RUSE - 2019, volume 58, book 3.4, pp.114-119, ISBN:1311-3321.

# ENERGY IS ETERNAL, ENERGY IS EVERYWHERE, ENERGY IS ENDLESS

#### **Evelina Kopcheva**

"Elias Canetti" Vocational School of Economics and managment, Ruse E-mail: eva\_grace@abv.bg

## **Dragomir Mitev**

"Elias Canetti" Vocational School of Economics and managment, Ruse E-mail: dragomir.s.mitev@abv.bg

Abstract: The paper reviews the effectiveness of teaching hours in an electronic distance learning (EDE) setting due to he imposed anti-epidemic measures in February-March, 2022. The results of an integrated lesson are presented, which includes studies drawn from the works of world-renowned scientists and developed by students of the 10th and 12th grades. The aim was to investigate the effectiveness of an integrated lesson, including the subjects of physics, with teacher M. Stoyanova, English language and folklore - E. Kopcheva, music and English language Dragomir Mitev, and chemistry and biology - with teacher V. Stoyanova.

Keywords: E-Learning, Integrated lesson, Knowledge, Skills.

# REFERENCES

Реtrov, P.D., P.R. Petrov 2016. School didactics. Sofia: "Avangard Prima" Publishing House. (**Оригинално заглавие:** Петров, П.Д., П.Р.Петров 2016. Училищна дидактика. София: Издателство "Авангард Прима").

LAW on preschool and school education (promulgated SN 79 of 13.10.2015, amended and supplemented by SN 82 of 18.09.2020) (act. 04.05.2022). (*Оригинално заглавие*: ЗАКОН за предучилищното и училищното образование (обн. ДВ. бр.79 от 13.10.2015 г., изм. и доп. ДВ. бр.82 от 18.09.2020 г.) (акт. 04.05.2022 г.)). URL: https://web.mon.bg/bg/57. (Accessed on 16.09.2022).

If You Drink Water You Should Watch This! Amazing Secret of Water - Influenced with Sounds & Intent!. URL: https://www.youtube.com/watch?v=FTIDNa2WVkA.

Masaru Emoto - Water Experiments - https://www.youtube.com/watch?v=1qQUFvufXp4

Why Do Americans Celebrate Thanksgiving?

URL: https://www.youtube.com/watch?v=hRbXzp1Ka80.

URL: History of the Holidays: History of Thanksgiving History,

https://www.youtube.com/watch?v=lslqtUMwDxA.

The Tragic Story of Nikola Tesla - https://www.youtube.com/watch?v=FeUA-0G1p5k.

Nikola Tesla Documentary The Forgetten Inventor,

URL: https://www.youtube.com/watch?v=zzS-PFMe\_Mk.

The Schumann Resonances What are they?,

URL: https://www.youtube.com/watch?v=1R6wfsssjLg.

5 Fascinating Facts about the Schumann Resonance,

URL: https://www.youtube.com/watch?v=1oZvDofugLY.

Helmholtz and Donders: Psychology [HPsy 4.5],

URL: https://www.youtube.com/watch?v=uizKkKcC-tg.

# THEORIES OF THE PROFESSIONAL AND CAREER DEVELOPMENT

**Pr. Assist. Prof. Lora Radoslavova, PhD** Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: 0889699115

E-mail: lradoslavova@uni-ruse.bg

**Abstract:** This scientific material explores the variety of theories, exploring the PCD. The structural theories of professional and career development, which focus on the individual characteristics of the person and its professional responsibilities. This category includes theories developed by Frank Parson, John Holland, as well as socioeconomic theories. The second category of theories refers to individual human development. Theories about professional and career development are oriented towards the biological, psychological, sociological and cultural aspects of the choice of the career by the individual. Among them are the interrelationships between the stages of development ( childhood, adolescence, maturity) and the professional dynamics of man.

Keywords: Theories of Professional and Career Development, Personal Development, Leadership, Social Development, Social Roles.

#### REFERENCES

Confederation of Employers and Industrialists in Bulgaria. Career development. Concepts, Research, Trends and Forecasts., Studios, p. 1. 26, 2015. (*Оригинално заглавие:* Конфедерация на работодателите и индустриалците в България. Кариерно развитие. Концепции, изследвания, тенденции и прогнози., Студия, стр. 26, 2015).

Gjoshev, B., L. Borisova. Planning of the career-roadmap for development., "Economics and Management", scientific journal of the Faculty of Economics at The University of National and World Economy "Neofit Rilski", year 2015 V, issue 1/2014 3, p. 1. 34, 2009. (*Оригинално заглавие:* Гьошев, Б., Л. Борисова. Планиране на кариерата-пътна карта за развитие., "Икономика и управление", научно списание на Стопанския факултет при ЮЗУ "Неофит Рилски", год. V, бр. 3, стр. 34, 2009).

Кагаbelyova, S., D. Doreva. Psychological aspects of career choices. P. 98, Yearbook of Sofia University "St. Constantine and Helena" "The Psychology Book," Volume 102. (*Оригинално заглавие:* Карабельова, С., Д. Дорева. Психологически аспекти на кариерния избор. стр. 98, Годишник на Софийския университет "Св. Климент Охридски", Книга Психология, Том 102).

Roadmap for career guidance policies for the future. transforming the career guidance focused on the skills, professions and career opportunities of the future for Generation Z, using a gamebased virtual reality platform (FUTURE), Project No 590221-EPP-1-2017-1-BG-EPPKA3-PI-FORWARD, co-financed under the Erasmus+ programme of the European Union, p. 1. 65. (*Оригинално заглавие:* Пътна карта за политиките по кариерно ориентиране за бъдещето. трансформиране на кариерното ориентиране насочено към уменията, професиите и кариерните възможности на бъдещето за Поколението Z, с помощта на игрово-базирана платформа за виртуална реалност (FUTURE), Проект N° 590221-EPP-1-2017-1-BG-EPPKA3-PI-FORWARD, съфинансиран по програма Erasmus+ на Европейския съюз, стр. 65).

# ORIGIN OF THE CONCEPTS OF SOCIAL GENDER IDENTITY IN BULGARIA AND WORLDWIDE

**Pr. Assist. Prof. Lora Radoslavova, PhD** Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: 0889699115 E-mail: lradoslavova@uni-ruse.bg

**Abstract:** The paper reviews existing educational, philosophical, psychological and political concepts and ideas about the phenomenon "social identity" in Bulgaria and in another countries, which are involved in searching pedagogical optimizing strategies, influencing over the contemporary educational process.

Keywords: Social Identity, Education, Comparative Analyze, Historical Review.

#### REFERENCES

Center for Gender Studies, Almaty", Kazakhstan, 2011. (**Оригинално заглавие**: Центр гендерных исследований, Алматы", Казахстан, 2011).

Сhakarov, N., Zh. Atanasov. History of Bulgarian education. Textbook for teachers' institutes., Ed. "Narodna Prosveta", S., 1970. р. 36-40. (*Оригинално заглавие: Чакъров, Н., Ж. Атанасов. История на българското образование. Учебник за учителските институти., Изд. ,,Народна Просвета", С., 1970г.стр. 36-40*).

Garvanova, M. Effects of gender, age, education, and socio-historical time on individualism/collectivism orientation. Bulgarian Journal of Psychology, 2013, no. 1-4, Official publication of the Society of Psychologists in Bulgaria, p. 166, ISSN 0861 – 7813. (*Оригинално заглавие:* Гарванова, М. Ефекти на пола, възрастта, образованието и социалноисторическото време върху ориентацията към индивидуализъм/колективизъм. Българско списание по психология, 2013, бр. 1-4, Официално издание на дружеството на психолозите в България, стр. 166, ISSN 0861 – 7813. )(PDF) Ефекти на пола, възрастта, образованието и социално-историческото време върху ориентацията към индивидуализъм/колективизъм. Аvailable from:

https://www.researchgate.net/publication/282644102\_Efekti\_na\_pola\_vzrastta\_obrazovanieto\_i\_s ocialno-istoriceskoto\_vreme\_vrhu\_orientaciata\_km\_individualizmkolektivizm [Accessed Sep 06 2022]).

Jung, K. G. Archetypes and the Collective Unconscious, EA. Pleven, pp. 167-169, 1999. (**Оригинално заглавие**: Юнг, К. Г. Архетиповете и колективното несъзнавано, ЕА. Плевен, стр. 167-169, 1999).

http://www.genderstudies.info/educat/educat2.php.

# PROFESSIONAL GENDER ASYMMETRY IN THE EDUCATIONAL SYSTEM

# **Pr. Assist. Prof. Lora Radoslavova, PhD** Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: 0889699115

E-mail: lradoslavova@uni-ruse.bg

**Abstract:** The paper reviews analyse of the existing situation in professional and career gender asymmetry in the Bulgarian educational system the report presents an analysis of statistical data regarding the gender distribution of academic professors and teachers, as well as strategic documents addressing gender equality at the national and international level.

*Keywords:* Professional and Career Development, Professional Asymmetry, Educational System, Contemporary Aspects.

#### REFERENCES

D.J. Brass. Power in organizations: a social network perspective, Res Polit Soc, 4 (1992), pp. 295-323.

M.L. Forret, T.W. Dougherty. Networking behaviors and career outcomes: differences for men and women? J Organ Behav, 25 (2004), pp. 419-437) (K.M. Quinlan. Enhancing mentoring and networking of junior academic women: what, why, and how? J High Educ Pol Manag, 21 (1999), pp. 31-42.

Lena Ansmann, Tabor E. Flickinger, Serena Barello, Marleen Kunneman, Sarah Mantwill, Sally Quilligan, Claudia Zanini, Karolien Aelbrecht, Career development for early career academics: Benefits of networking and the role of professional societies, Patient Education and Counseling, Volume 97, Issue 1, 2014, Pages 132-134, ISSN 0738-3991, https://doi.org/10.1016/j.pec.2014.06.013.

Žveglič Mihelič, Mojca & Nosonjin, Marina & Gojkov-Rajić, Aleksandra & Zuljan, Milena. (2022). Motivations for Choosing a Career and the Expectations of Serbian and Slovenian Preschool Teachers of their Own Career Development. International Journal of Cognitive Research in Science Engineering and Education. 10. 71-91. 10.23947/2334-8496-2022-10-1-71-91.

# TRENDS AND INNOVATIVE APPROACHES IN PROFESSIONAL AND CAREER GUIDANCE

**Pr. Assist. Prof. Lora Radoslavova, PhD** Department of Pedagogy, University of Ruse "Angel Kanchev" Tel.: 0889699115 E-mail: lradoslavova@uni-ruse.bg

**Abstract:** The paper reviews existing innovative approaches and techniques for professional and career guidance. As information technology develops, their application is also growing in terms of career guidance. a number of examples resulting from the scientific and empirical development of the disciplinary field can be drawn. The purpose of this report is to examine and describe some of them. There had been observed the Fuzzy Analytic Hierarchy Process, the IoT-theory, the DLEI influence over the process of professional guidance.

Keywords: Professional and Career Guidance, Approaches, Trends, Effectiveness, DLEI.

#### REFERENCES

Anna V. Tukshumskaya, Tatiana N. Popova, Natalia Y. Tihanova. *Application of Modern Information Systems in the Framework of the Educational Course "Self-Determination and Professional Orientation of the Student's Personality"*. ITM Web Conf., Volume 35, 2020, International Forum "IT-Technologies for Engineering Education: New Trends and Implementing Experience" (ITEE-2019,) https://doi.org/10.1051/itmconf/20203506009.

Hayat Mikrat, Meryem Fakhouri Amr, Ayoub Bahnasse, Mohammed Talea. *Review of the Student's Orientation in the Age of New Technologies*, Procedia Computer Science, Volume 203, 2022, Pages 683-687, ISSN 1877-0509, https://doi.org/10.1016/j.procs.2022.07.101. (https://www.sciencedirect.com/science/article/pii/S1877050922007062.

Molodozhnikova, N., Biryukova, N., Galustyan, O., Lazareva, J. & Stroiteleva, N. (2020). *Formation of Professional Orientation of High School Students to Medical Profession by Using ICT Tools*. of Emerging International Journal of Emerging Technologies in Learning (iJET), 15(1), 231-239. Kassel, Germany: International Journal Technology in Learning. Retrieved August 27, 2022 from https://www.learntechlib.org/p/217065/.

N. K. Baklanova, P. A. Stepichev. Creative Orientation Development as a Requirement of Professional Training of a Teacher in the XXI Century. Paradigms of knowledge, 1, 2016).

Radoslavova, L. (2022). Professional and Career Development. Socio- Educational Aspects. p. 10, ISBN: 978-619-7604-30-6. // (*С оригинално заглавие на български*: Радославова, Л. (2022). Професионално и кариерно развитие. Социално-педагогиюески аспекти. стр. 10, ISBN: 978-619-7604-30-6).

Азатян С. А., Романенко О. С., Степичев П. А. Опыт развития творческого потенциала школьников на занятии иностранным языком // Современные гуманитарные исследования. – М., 2012. – № 3.

Бакланов К. В. Использование мультимедийных презентаций в процессе адаптации студентов – первокурсников к процессу адаптации студентов-первокурсников к обучению в вузе// Вестник Российского нового университета. Серия: Человек в современном мире – 2014. – Вып. 1. – С. 68-70.

#### FRI-2G.309-LL-01

# BULGARIANS' SENSE OF HUMOR EXPRESSED BY IRONICAL AND JOKEY PHRASEOLOGISMS

#### Assoc. Prof. Emilia Nedkova, PhD

Department of Bulgarian Language, Literature and Art, University of Ruse "Angel Kanchev" Tel.: 082 888 347 E-mail: enedkova@uni-ruse.bg

**Abstract:** In Bulgarian language there are many ironic and jokey phraseologisms (= phraseological unit = PhU), in which, along with their purely evaluative meaning, we find a smart expression of Bulgarians' sense of humor. This sense of humor is undoubtedly a reflection of Bulgarians' attitude to reality and originates mostly from their worldview. Therefore, in the context of this subject-matter, it is quite interesting to study the Bulgarians' sense of humor, understood through the prism of phraseology and as a reflection of Bulgarian national mentality.

Keywords: Ironic and Jokey Phraseologisms, Bulgarian Language, humor.

#### REFERENCES

Копstantinova 2014: Konstantinova, D. Irony in Phraseology. Ways of Creating Ironic Effect in Phraseology. E-journal LiterNet.02.03.2014, No 3/172. (*Оригинално заглавие:* Константинова 2014: Константинова, Д. Иронията във фразеологията. Начини за създаване на ироничен ефект във фразеологията. Ел. списание LiterNet.02.03.2014,№3/172).

Kyuvlieva-Mishaykova 1986 Kyuvlieva-Mishaykova, V. Phraseologisms in Bulgarian Language. Sofia,1986. (*Оригинално заглавие:* Кювлиева – Мишайкова 1986: Кювлиева – Мишайкова, В. Фразеологизмите в българския език. София,1986).

Maslova 2001: Maslova, V. N. Linguoculturology. Moscow, 2011. (*Оригинално заглавие:* Маслова 2001: Маслова, В. Н. Лингвокультурология. Москва, 2011).

Nedkova 2011: Nedkova, E. Phraseologisms as Cultural Signs. Ruse, 2011. (*Оригинално заглавие:* Недкова 2011: Недкова, Е. Фразеологизмите като знаци на културата. Русе, 2011.)

Chizmarov 1882: Chizmarov, D. Stylistics of Contemporary Bulgarian Literary Language. Sofia, 1882. (*Оригинално заглавие:* Чизмаров 1882: Чизмаров, Д. Стилистика на съвременния книжовен български език. София, 1882.)

#### EXCERPTED SOURCES:

New Dictionary of Phraseology. К. Nicheva. Sofia, 1993 (*Оригинално заглавие:* Нов фразеологичен речник. К. Ничева. София, 1993).

Dictionary of Phraseology in Bulgarian Language. K. Nicheva, S. Spasova-Mihaylova, Kr. Cholakova. Vol .I, II. Sofia,1974/1975. (*Оригинално заглавие:* Фразеологичен речник на българския език. К. Ничева, С. Спасова-Михайлова, Кр. Чолакова. Т.I, II. София,1974/1975).

# SUBJECT LAYER OF THE LITERARY CONCEPT *FAITH*, OBJECTIVIZED IN THE BULGARIAN DRAMAS OF THE BEGINNING OF THE TWENTIETH CENTURY

#### Pr. Assist. Prof. Maria Stefanova, PhD

Department of Bulgarian Language, Literature, History and Art, University of Ruse "Angel Kanchev" Tel.: 0884564774 E-mail: mstefanova@uni-ruse.bg

**Abstract:** The article presents a cognitive-stylistic analysis of the subject layer of the literary concept faith, linguistically represented in Bulgarian dramas from the beginning of the twentieth century. Observations on the excerpted material show that the subject layer of the considered concept is encoded by sound, visual and tactile signs that are related to the actualization of faith as a belief in the real existence of God and as a creed, religion. The done cognitive-stylistic analysis reveals not only the content of the concept faith, but also contributes to the study of the Bulgarian literary picture of the world.

Keywords: cognitive stylistics, literary concept, subject layer, cognitive-stylistic analysis, faith.

## REFERENCES

Butakova, L., 2002. Cognitive Poetics: a Variant of Text Interpretation. Sentence and word. Collection of scientific papers. Saratov: Saratov University Press. (*Оригинално заглавие:* Бутакова, Л., 2000. Когнитивная поэтика: вариант интерпретации текста. Предложение и слово. Сборник научных трудов. Саратов: Издательство Саратовского университета).

Strashimirov, A., 1900. Saints of Prilep. Sofia: Printing house of Iv. K. Tsutsev. (*Оригинално* заглавие: Страшимиров, А., 1900. Прилъпски светци. София: Печатница на Ив. К. Цуцевъ).

Strashimirov, A., 1963. Works. Vol. 6. Sofia: Bulgarian writer. (*Оригинално заглавие:* Страшимиров, А., 1963. Съчинения. Том 6. София: Български писател).

Strashimirov, A., 2008. Five symbolist plays. Veliko Tarnovo: Faber. (*Оригинално* заглавие: Страшимиров, А., 2008. Пет символистични пиеси. Велико Търново: Фабер).

Tarasova, I., 2003. Georgy Ivanov's Idiostyle: Cognitive Aspect. Saratov: Saratov University. (**Оригинално заглавие:** Тарасова, И., 2003. Идиостил Георгия Иванова: когнитивный аспект. Саратов: Саратовского университета).

Тоdorov, P., 1980. Collected works. Vol. 2. Sofia: Bulgarian writer. (*Оригинално заглавие: Тодоров, П., 1980 Събрани съчинения. Том 2. София: Български писател*).

Yavorov, P., 1978. Collected works. Vol. 3. Edited by S. Gyorova. Sofia: Bulgarian writer. (**Оригинално заглавие:** Яворов, П., 1978. Събрани съчинения. Т. 3. Под ред. на С. Гьорова. София: Български писател).

# ON SOME ASPECTS OF THE CULTURAL MODELS OF THE FESTIVE TRADITIONS, RITES AND RITUALS OF BULGARIANS AND POLES

**Pr. Assist. Prof. Niya Peneva, PhD** Department of Bulgarian Language, Literature, History and Art, University of Ruse "Angel Kanchev" Tel.: 0886214639 E-mail: ndoneva@uni-ruse.bg

**Summary:** The study presents aspects of the cultural models of the festive traditions, rites and rituals of Bulgarians and Poles with regard to the value systems of these two peoples. It highlights parallels and contrasting patterns, sheds light on issues such as the autonomy, specific characteristics as a result of interaction, different ways of continuity, the effect of ideology, religion etc. The indicators are: conservatism, social function, relations and attitude to family and kin, autonomy, coherence and comparability of the worldview.

Key words: cultural models, rites and rituals, festivities, Bulgarians, Poles.

## REFERENCES

Gladkovski, M. (1995). *The sacred in the Polish folk beliefs and rituals*. (**Оригинално** *заглавие:* Гладковски, Г. Сакралното в полските народни вярвания и ритуали. – В: Български фолклор, № 1-2, 1995, 129-142).

Grozeva, V. (1997). Ortodoxal traditions and Bulgarian old phenomenon. (Оригинално заглавие: Грозева, В. Православни традиции и български стародавни явления. С., 1997).

Dyakov, T. (2003). *The folk calendar: celebrations and beliefs of Bulgarians*. (*Оригинално заглавие:* Дяков, Т.: Народният календар: Празници и вярвания на българите. С., 2003).

Zamojski, A. (2005). *The polish way: The millennial history of Polish and their culture*. (*Оригинално заглавие:* Замойски, А. Полският път. Хилядолетната история на поляците и тяхната култура, В.Търново, 2005).

Marinov, D. (1981). Selected works. Folk beliefes and religious folk customs. (Оригинално заглавие: Маринов, Д. Избрани произведения, т.1. Народна вяра и религиозни народни обичаи. С., 1981).

Marinov, D. (1981). Selected works. Folk beliefes and religious folk customs. (Оригинално заглавие: Маринов, Д. Избрани произведения, т.9. Народна вяра и религиозни народни обичаи. С., 1981).

Міtev, Р. (2007). *The European values and the civil society: problems and solutions*. (*Оригинално заглавие:* Митев, П. Европейските ценности и гражданско общество: проблеми и подходи. – В: Ново време, № 12, 2007, 17-23).

Mihailova, К. (2005). *Celebrations and identity of Poles in Bulgaria*. (*Оригинално заглавие*: Михайлова, К. Празници и идентичност на поляците в България. – В: Проблеми на българския фолклор, 2005, 415-420).

Petrova-Chompalova, V. (2004). Poland and Poles in the Bulgarian's minds: from the end of XIX century to The Second World War. (**Оригинално заглавие:** Петрова-Чомпалова, В. Полша и поляците в представите на българите: от края на XIX в. до Втората Световна война, Пловдив, 2004).

Stojcheva, Sv. (2009). *Тоо human...* (*Оригинално заглавие:* Стойчева, Св. Човешко, твърде... – В: Литературен вестник, 2009, бр.14, с. 4).

Ророva, J. (2011). *Reader in intercultural communication*. (*Оригинално заглавие:* Помагало по интеркултурна комуникация, Русе, 2011, с.62).

# IVAN SHISHMANOV – THE REFORMER AND THE BULGARIAN EDUCATION

#### Assoc. Prof. Velislava Doneva, PhD

Department of Bulgarian Language, Literature, History and Art, University of Ruse "Angel Kanchev" Tel.:0886060299 E-mail: doneva\_v@uni-ruse.bg

Abstract: Prof. Ivan Shishmanov is the Bulgarian intellectual, who served the Bulgarian socio-political and cultural life as a devoted man of science and as a statesman for 40 years. He was only 28 when he worked on the Law on Public Education of 1890, during the mandate of Minister Georgi Zhivkov. Later he was a minister in the same Ministry (1903-1907). with his educational policy, which is the subject of this research paper, Prof. Ivan Shishmanov proves that the educational factor has an enormous impact in the modern state and for this reason, he had been working as a real master on the institutional construction of Bulgarian culture, education and science. The ideas of the professor in Bulgarian studies Ivan Shishmanov for the schools in Bulgaria have their modern projections in Bulgarian education today.

Keywords: Ivan Shishmanov, education, programme, reforms, school, teacher.

## REFERENCES

Arnaudov, M., 1978. *Homage to Shishmanov's Shadow*. In Pulse, 20 June 1978, issue 13 (*Оригинално заглавие:* Арнаудов, М., 1978. Поклон пред сянката на Шишманов – в: Пулс, 20 юни 1978, бр. 13).

Yanev, S., Borisova, B. and Petkov, S. (Eds.)., 2003, *Atlas of Bulgarian Literature*. In Flag, Year VIII, 1905, issue 60, р. 6 (*Оригинално заглавие:* Атлас на българската литература, съст. С. Янев, Б. Борисова, С. Петков (2003). Пряпорец, год. VIII, 1905, бр.60, с. 6).

Vasilev, S., 1971, *Ivan Shishmanov and His Critical Reviews. In Builders of the Mother Tongue*, 1921, vol. IV, p. 29 (*Оригинално заглавие:* Василев, Ст. (1971). Иван Шишманов и неговият критически език – в: Строители на родната реч, 1921, кн. IV, с. 29).

Galabov, K., 1928. *The Legacy of Shishmanov*. In Native Speech, 1928, Year II, book 1, pp. 16-17 (*Оригинално заглавие:* Гълъбов, К. (1928). Шишмановият завет – в: Родна реч, 1928, год. II, кн. 1, с. 16-17).

Mladenov, S., 1928. *The Scientific Work of Prof. Ivan Shishmanov*. In Native Speech, 1928, Year II, vol. 1, p. 8 (*Оригинално заглавие:* Младенов, Ст. (1928). Научното дело на проф. Иван Шишманова – в: Родна реч, 1928, год. II, кн. 1, с. 8).

Sjupjur, E., 1973. *Ivan Shishmanov and the Romanian-Bulgarian Cultural Relations*. In Literary Thought, vol. 2, p. 85, pp. 90-93 (*Оригинално заглавие:* Сюпюр, Е. (1973). Иван Шишманов и румъно-българските културни взаимоотношения – в: Литературна мисъл, кн. 2, с. 85, с. 90-93).

Chilingirov, S., 1928. a *Memory of Ivan Shishmanov. In Native Speech*, 1928, Year II, vol. 1, р. 20 (*Оригинално заглавие:* Чилингиров, Ст. (1928). Един спомен за Иван Шишманов – в: Родна реч, 1928, год. II, кн. 1, с. 20).

Chilingirov, S., 1955. *Memories. My Contemporaries*. Sofia, 1955, vol. 1 (*Оригинално заглавие:* Чилингиров, Ст. (1955). Спомени. Моите съвременници, С., 1955, т. 1).

# THE IMAGE OF WOMAN IN "WOMEN'S PORTRAITS" BY EMANUIL POPDIMITROV

#### Pr. Assist. Petya Abrasheva, PhD

Department of Bulgarian Language, Literature, History and Arts, University of Ruse "Angel Kanchev" E-mail: pabrasheva@uni-ruse.bg

**Abstract:** The text focuses on the specific ways in which Emanuil Popdimitrov constructs women's characters in his famous poetic cycle "Women's Portraits". Although the genre of the portrait presupposes representation of a person which captures the characteristic features of His/Hers personality, Popdimitrov's "Women's portraits" are not exactly portraits and not quite "women's". They use women's figures only to depict the experiences of the lyrical subject. The text surveys the features of the physical portrait and the influence of the secession aesthetics in women's representations in order to show that the main aim of the poet in his "Women's Portraits" is to aestheticize the image of woman and to depict Her as symbol of beauty and perfection.

Keywords: Emanuil Popdimitrov, "Women's Portraits", women's character, aestheticization, secession aesthetics.

#### REFERENCES

Dobrev, D. (2000). Symbols in the works of Bulgarian symbolists. Sofia: Siela (*Оригинално заглавие:* Добрев, Д., 2000. Символите в творчеството на българските символисти. София: Siela).

Dudevski, Ch. (1969). Emanuil Popdimitrow. Sofia: Bulgarian Writer Press (*Оригинално заглавие:* Дудевски, Хр., 1969. Емануил Попдимитров. София: Български писател).

Igov., Sv. (2010). Emanuil Popdimitrov in: History of Bulgarian literature. Sofia: Bulgarian Academy of Sciences, 569-572 (*Оригинално заглавие:* Игов, Св., 2010. Емануил Попдимитров. В: История на българската литература. София: БАН, 569-572).

Kirova, M. (2018). Bulgarian Litearture from the Liberation to First World War, vol. 2. Sofia: Kolibri Press. (*Оригинално заглавие:* Кирова, М., Българската литература от Освобождението до Първата световна война. София: Колибри).

Мihaylov, D. (1995). The Lyrics of Emanuil Popdimitrov. In Radev, I., (ed.) 1995. *Dimitar Boyadzhiev, Teodor Trayanov, Emanuil Popdimitrov*. Veliko Tarnovo: Slovo Press (*Оригинално заглавие:* Михайлов, Д., 1995. Лириката на Емануил Попдимитров. В: Радев, И., (ред.) *Димитър Бояджиев. Теодор Траянов, Емануил Попдимитров*. Велико Търново: Слово).

Рорdimitrov, Em., (1931-1932). Collected Works, vol. 1-2. Sofia: Gladston Press (*Оригинално заглавие:* Попдимитров, Ем., 1931-1932. Събрани съчинения, том 1-2. София: печатница "Гладстон").

Рипdev, V. (1922). Emanuil Popdimitrov. *Democratic Review*, XVI, № 7, 430-436 (*Оригинално заглавие:* Пундев, W., 1922. Емануил Попдимитров. *Демократически преглед*, год. XVI, № 7, 430-436).

# BULGARIANNESS ACCORDING TO SONGS DEDICATED TO THE NATIONAL FOOTBALL TEAM

# Kamen Rikev, DSc

Institute of Linguistics and Literary Studies Maria Curie-Sklodowska University in Lublin, Poland Tel.: +48514441160 E-mail: rikev@umcs.pl

Abstract: The paper examines the self-presentation of national characteristics and symbolism according to songs dedicated to the Bulgarian men's national football team. to date, four songs created in the period 1986–1998 gained popularity in the country. The analyzed texts are undoubtedly transferring rhetorical strategies of songwriters and producers, and due to the participation in the World Cup tournaments in Mexico (1986), USA (1994) and France (1998) they reflect the feelings of unity, satisfaction and hopes of the public, perceived as a collective, people or nation. The Bulgarian football team is revealed either as an emanation of the community, its spirit and qualities (on the basis of sameness between the nation and its sports team), or as the consolation of the nation (on the basis of the opposition 'poor people – exceptional team'). The most significant model of Bulgarian communal valuing turns out to be the maintainance of the National Revival symbolic system with an emphasis on sacrifice and the figure of the hajduk. The research clearly shows that by the end of the 20th century Bulgarians continue to present themselves as junaks (folk heroes), while the nation is thought of in the categories of common people.

Keywords: football song, Bulgarian national team, bulgarianness, national self-presentation, World Cup songs.

#### REFERENCES

Barthes, R. (1970). Le Tour de France comme épopée. In Barthes, R. *Mythologies*. 2<sup>nd</sup> ed. (1st ed. 1957). Paris: Seuil, 103-113.

Blitz (2015). Cult Musician Salko Pisin: They Shot My Duet Partner Zheni Nikolova as She Was Singing in a Restaurant. (21.04.2015). https://blitz.bg/article/41375. Accessed on 09.10.2022. (*Оригинално заглавие:* "Блиц". Култовият музикант Салко Писин: Застреляха дуетната ми половинка Жени Николова, както пеела в ресторант. (21.04.2015). https://blitz.bg/article/41375. Достъп: 09.10.2022).

Bulgaria Today (2014). Salko Pisin: I Sang to Zhivkov, Dogan, the Tsar and Boyko. (10.06.2014). https://www.bgdnes.bg/Article/4130702. Accessed on 09.10.2022. (*Оригинално заглавие:* "България днес". Салко Писин: Пял съм на Живков, Доган, царя и Бойко. (10.06.2014). – https://www.bgdnes.bg/Article/4130702. Достъп: 09.10.2022).

Nikolov, E. (2014). Bulgaria in the European Cup. *Culture* (Sofia), no 30 (16.07.2004). (*Оригинално заглавие:* Николов, Е. България на Европейското. В-к *Култура*, бр. 30 (16.07.2004)).

Stoichkov, H. & Pamukov, V. (2018). *Hristo Stoichkov. The Story*. 2<sup>nd</sup> expanded ed. Sofia: Soft-Press. (*Оригинално заглавие:* Стоичков, Х., Памуков, В. *Христо Стоичков. Историята*. Второ, допълнено издание. София: Софт-прес).

## FRI-2G.307-AS-01

# MUSICAL ENVIORMENTS IN REALITY TALENT SHOWS

#### Nikolay Yordanov

Department of Screen Arts, National Academy of Theatre and Film Arts, Bulgaria Tel.: +359887255380 E-mail: nikolay.y.yordanov@gmail.com

**Abstract:** The report explores the methods of creating musical environments in TV reality talent shows, reflecting the cultural and regional specifics, political situation, and audience parameters. The research is based on the authors professional experience, TV Bibles documentation, as well as international profiles studies. It contains three segments: 1. Reality shows prerequisites for occurrence and first examples. 2. Music environment in talent shows; 3. Musical repertoire in singer competitions.

Keywords: Reality Television, Content creating, music.

## REFERENCES

Richmond, Ray (2008). Timeline: 60 years of Reality TV Programming. Hollywood Reporter

Terrace, Vincent (2011). Encyclopaedia of Television Shows – 1925 through 2010. McFarland & Company.

Andrejevič, Mark (2008) Reality TV". Rowman & Littlefield Publishers, INC.

Tsvetkova, Yuliana (2017) Pop Cultutre in Europe: Talent Search Shows. ABC-CLIO USA.

# SOME FEATURES OF THE HUMAN AUDITORY SYSTEM

Assoc. Prof. Pavel Stefanov, PhD Department of Soundengineering and Sounddesign, National Academy of Music "Prof. Pancho Vladigerov" – Sofia Tel.: 086-820 471 E-mail: pavel\_stfnv@mail.bg

**Abstract:** The human auditory system has enormous capabilities for perceiving and processing sound signals. Modern three-dimensional surround systems have been developed using in-depth knowledge of the features and conditions of human hearing. This essay discusses a few pschoacoustic regularities that affect human auditory perception.

**Keywords:** psychoacoustics, absolute hearing thresholds, differential hearing thresholds, loudness, critical hearing bands

#### REFERENCES

Aldoshina, I., Pritts, R. (2006). *Musical acoustics*. Composer St Petersburg.

Krachounova-Popova, V. (2017). Sound in documentary cinema. Dissertation, NATFA "Krastyo Sarafov", 2017. (Оригинално заглавие: Звукът в документалното кино).

Krachounova-Popova, V. (2017). Specificity of sound in documentary cinema. a symbiosis of approaches. Cinema Magazine, issue 4/2017. (**Оригинално заглавие:** Специфика на звука в документалното кино. Симбиоза на подходите).

Krachounova-Popova, V. (2017). *The Sound Environment in the Films of Julius Stoyanov'*. Yearbook of NATFA "Krastoy Sarafov", 2017, pp. 225-229 (*Оригинално заглавие: Звуковата среда във филмите на Юлий Стоянов'*).

Stefanova, P. (2018). Alternative Musical Instruments - a Look to the Future in Music Pedagogy, NBU Scientific Conference, 2018 (**Оригинално заглавие:** Алтернативните музикални инструменти – поглед към бъдещето в музикалната педагогика).

Stefanova, P. (2014). Sounding a literary text as a form of developing the creative thinking of preschool and primary school-age children. Almanac of NMA "Prof. Pancho Vladigerov" 2014. (Оригинално заглавие: Озвучаването на литературен текст като форма на развитие на творческото мислене на децата от предучилищна и начална училищна възраст).

Stefanova, P. (2019). Music workshop: ideas, tasks, examples from practice. Pedagogical Novelties Magazine, Issue 1, Year IX, 2020, pp. 67-73. (Оригинално заглавие: Музикалнотворческо ателие: идеи, задачи, примери от практиката).

Dickreiter, M. (2003). Mikrofon-Aufnahmetechnik. Hirzel, Stuttgart.

Everest, F. A., Pohlmann, C. K. (2009). *Master Handbook of Acoustics*. McGraw-Hill Companies, Inc.

Meyer, J. (2009). Acoustics and the Performance of Music. Springer Science+Business Media, LLC.

# TO SENSE THE SPACE AND SOUND

#### Assoc. Prof. Elena Trencheva, PhD

Faculty: Screen Arts, Department of Film and TV Sound, National Academy for Theatre and Film Arts, Sofia, Bulgaria Tel.: +359 888 98 67 67 E-mail: elenatrenchev@abv.bg

#### Assoc. Prof. Valeria Krachunova-Popova, PhD Faculty: Screen Arts, Department of Film and TV Sound, National Academy for Theatre and Film Arts, Sofia, Bulgaria Tel.: +359887 698 643 E-mail: v.krachunova@gmail.com

**Abstract:** The paper reviews experimental approach and results used in two master classes "Spatial sound scene" (associate Prof. Elena Trencheva PhD; associate Prof. Valeria Krachunova Popova, PhD) and their attempt to achieve audio-visual product by using space as a visual environment defined by the perception of sound and vice versa - sound as a sound environment defined by the perception of space. The papper covers the aspects connected to the possibilities to impact and change these perceptions when both environments are combined in one product/film; the interaction of the visual and sound departments to make a good symbiosis and a unified message of the final product.

Keywords: Design, Sound Design, Experimental, Post Produciont, Recording, Audio mixing.

#### REFERENCES

Radeva, V.; Stefanova, P., - " Innovative forms of work with children from primary school level in aesthetic environment: synthesis of the arts ", 53-th Science Conference of Ruse University, 2014 (Стефанова, П. – "Иновативни форми на работа с деца от начална училищна степен в естетическа среда: синтез на изкуствата", доклад, 53-та научна конферения на Русенски Университет, 2014).

Stefanova, P., - " Successful practices in non-proffesional music education ", 56th Science Conference of Ruse University, 2017 (Стефанова, П. – "Добри практики в обучението по музика на непрофесионалисти ", доклад, 56-та научна конферения на Русенски Университет, 2017).

Stefanova, P., Stefanov, P., - "The computer as a recording studio: the role of sound diversity in primary education", 54th Science Conference of Ruse University, 2015 (Стефанов, П., - ,, Компютърът като звукозаписно студио: ролята на звуковото многообразие в началното образование ", доклад, 54-ма научна конферения на Русенски Университет, 2015).

Stefanov, P., - "Equalizers", 55th Science Conference of Ruse University, 2016 (Стефанов, П., - " Еквалайзери", доклад, 55-та научна конферения на Русенски Университет, 2016).

Stefanov, P., - "Absorbshion", 57th Science Conference of Ruse University, 2018 (Стефанов, П., - "Звукопоглъщане", доклад, 57-ма научна конферения на Русенски Университет, 2018).

Tsvetkova. Tsv., - "Evolution of Music as an Element of the Animation Film Sound Design" 60th Science Conference of Ruse University, 2021,(оригинално заглавие: Цветкова, Ц Докладът е представен на 60-та конференция на Русенския университет на 29 октомври 2021 г. в секция Изкуствознание с оригинално заглавие на български език: Еволюция на музиката като елемент от звуковия дизайн на анимационния филм).

# GUIDO ADLER'S IDEAS OF "MUSICAL CHIAROSCURO" AND "ACOUSTIC PERSPECTIVE" IN THE CONTEXT OF HIS CONCEPT OF STYLE AS WELL AS THEIR RECEPTION IN CONTEMPORARY MUSIC THEORY

## Assist. Prof. Zornitsa Dimitrova, PhD

Music Department, Research Group Music Culture and Information, Institute of Art Studies, Bulgarian Academy of Sciences, Sofia Tel.: +359 888 880 402 E-mail: dimitrovazornitsa79@gmail.com

**Abstract:** This piece of research examines Guido Adler's ideas of "musical chiaroscuro" and "acoustic perspective" set forth in his work "Style in Music" regarding performance as an aspect of his concept of style. The exposition presents the author's views and comments on certain aspects of the ideas formulated while also tracing their reception in modern understanding of musical space. a conception is put forward for the application of "musical chiaroscuro" and "acoustic perspective" in the context of current developments in performance theory and performance practice.

Keywords: theory of musical style, performance style, musical space, performance.

# REFERENCES

Adler, G. (1911). Der Stil in der Musik. I. Buch: Prinzipien und Arten des musikalischen Stils. Leipzig: Breitkopf & Härtel.

Börsing, Ch. (2013). Klang als Raum – Raum als Klang. Dimensionen musikalischer Raumzeit. URL: http://boersing.com/wp-content/uploads/2013/05/SkriptKS-NRW\_V%C3%96.pdf (Accessed on 13.10.2022).

Buleva, M. (2015). Musical Space and Time as an Idea of Music Tectonics. 53<sup>Th</sup> Annual Science Conference of Ruse University, 157-162. (**Оригинално заглавие:** Булева, М. Музикалното пространство и време като идея за музикална тектоника. Научни трудове на Русенски университет "Ангел Кънчев", Т. 53, серия 6.3., 157-162).

Finnendahl, O. Musik und Raum in der komponierten Musik. URL: https://icem.folkwang-uni.de/~finnendahl/resources/pdf/adk\_raum\_publikation.pdf.

Stockhausen, K. (1959). Musik im Raum. URL: https://www.ak.tuberlin.de/fileadmin/a0135/Unterrichtsmaterial/Hofmann/Stockhausen\_-\_Musik\_im\_Raum.pdf (Accessed on 13.10.2022).

Мозгот, С. (2007). Специфика исследования пространства в музыке: к проблеме включения аналитического метода. Вестник Адыгейского государственного университета. Серия 2: Филология и искусствоведение. 2007. №2. URL:

https://cyberleninka.ru/article/n/spetsifika-issledovaniya-prostranstva-v-muzyke-k-probleme-vklyucheniya-analiticheskogo-metoda (Accessed on 13.10.2022).

Тарароев, Я. (2019). Философские репрезантации понятий "пространство" и "время": от физики к музыке. ВІСНИК ХАРКІВСЬКОГО НАЦІОНАЛЬНОГО УНІВЕРСИТЕТУ імені КАРАЗІНА. Випуск 60, 84-94.

# MUMBLECORE: FEATURE FILMS IN THE DOCUMENTARY AESTHETIC

#### Assist. Prof. Dimiter 'Martin' Genovski, PhD(c) Faculty: Screen Arts, Department of Film and TV Directing, National Academy for Theatre and Film Arts, Sofia, Bulgaria Tel.: +359 890 333 369 E-mail: martin@genovski.com

**Abstract:** The paper reviews mumblecore's characteristics of a specific art movement in cinema. Born out of the desire of filmmakers lacking a sufficient budget but eager to tell film stories, the movement has successfully developed in the digital age, where filming technology is more accessible than ever. with a major focus on the characters' inner world, told through their everyday lives, the movement appears as an alternative to spectacular blockbuster films. Aiming to create a sense of realism, mumblecore films use the aesthetics of documentary cinema. The main components of these films are the acting and the plot. They are usually made with a very low production budget, making them very suitable for filmmakers in countries with a very limited budget for cinema. At the same time, those films allow an impactful presentation of important social and cultural issues. The mumblecore films found their place on streaming platforms, where they generate high viewership.

Keywords: Mumblecore, Low-budget films, Film directing approaches, Feature, Documentary.

## REFERENCES

Bedard, M., 2020. *What is Mumblecore? An American DIY Film Movement*. USA: Studio Blinder. URL: https://www.studiobinder.com/blog/what-is-mumblecore-film-movement/ (Accessed on 25.09.2022).

Donev, A., 2019. Independent cinema – from Edison to Netflix. Sofia: Fun Tasy (**Оригинално** заглавие: Донев, А., 2019. "Независимите в киното – от Едисон до Нетфликс". София; Издателство "Фън Тези").

Gundersen, M., 2019. *Why Norway's Skam Was So Great*. Norway: Life in Norway. URL: https://www.lifeinnorway.net/skam-norway/ (Accessed on 25.09.2022).

Jolin, D., 2021. 'Nomadland' producers explain how the unorthodox project came together. USA: Screen Daily. URL: https://www.screendaily.com/features/nomadland-producers-explain-how-the-unorthodox-project-came-together/5158545.article (Accessed on 25.09.2022).

Keslassy, E., 2021. Netflix Launches Nordic Office in Sweden. USA: Variety. URL: https://variety.com/2021/digital/global/netflix-nordic-office-sweden-1234962502/ (Accessed on 25.09.2022).

Matt, 2020. *What is Mumblecore? Complete Guide to The Genre with Examples*. USA: Filmmaking Lifestyle. URL: https://filmlifestyle.com/what-is-mumblecore/ (Accessed on 25.09.2022).

# DEVELOPING MUSICAL LITERACY IN CHILDREN THROUGH CLASSICAL GAME APPROACHES, ORIGINAL MUSIC GAMES AND DIGITAL EDUCATIONAL RESOURCES

## Pr. Assist. Prof. Petya Stefanova, PhD

Department of Bulgarian Language, Literature and Art, University of Ruse "Angel Kanchev" Tel.: +359 896 820 470 E mail: pstefanova@uni-ruse.bg

**Abstract:** The focus of the article is to present the author 's model of musical literacy. It is based on the idea of gamification, using didactic materials created by children, i.e., puppets and toys that are constructed on the principle of LEGO toys. The created versions are attractive for children, and a pre-arranged colour code allows the performance of a particular melody that can be played on traditional and non-traditional musical instruments. The process of making the puppets and toys by children is seen as a creative act that would contribute immensely to their further involvement in play actions. This would also facilitate the formation of attitudes and a deeper perception of the puppet as a partner in play and communication.

Keywords: Music education, musical literacy, play, composing, educational resources, puppet.

# REFERENCES

Krachunova-Popova, V. (2021). Recording music on set – specifics and challenges. In: 60th Annual Scientific Conference - University of Ruse and Union of Scientists, Bulgaria, pp. 127-132.

Кrachounova-Popova, V. (2017). Specificity of sound in documentary cinema. a symbiosis of approaches. In: *Cinema Magazine*, issue 4/2017. (*Оригинално заглавие: Крачунова – Попова*, *В. (2017). Специфика на звука в документалното кино. Симбиоза на подходите В: Списание Кино).* 

Gianni Roadari (2015). a Grammer of Fantasy. Sofia: Ciela. (*Оригинално заглавие: Родари,* Дж. (2015). Граматика на фантазията. София: Сиела).

Huiyinga, J. (1982). Homo Ludens. Sofia: Science and art. (*Оригинално заглавие:* Хьойзинха, Й. (1982). Ното Ludens. София: Наука и изкуство.

Passi, I. (1988). Metaphor. Sofia: Science and art. (*Оригинално заглавие:* Паси, И. (1988). Метафората. София: Наука и изкуство).

Stefanov, P. (2015). Innovative Approach in the Application of Computer Technology in Music Education Process in Elementary School. In: Academic Forum Integral Music Theory 2015 (International Conference). Sofia, pp. 42-45. (Оригинално заглавие: Стефанов, П. (2015) Иновативен подход в приложението на компютърните технологии в музикалнообразователния процес в началното училище. В: Теоретична конференция на НМА "Интегрална музикална теория", София, с. 42-45).

Stefanov, P. (2015). Artificial reverberation. In: Almanac of the National Academy of Music "Prof. Pancho Vladigerov", Sofia, year 7 (2015). (*Оригинално заглавие:* Стефанов, П. (2015). Изкуствена реверберация. Алманах на Национална музикална академия "Проф. Панчо Владигеров", година 7).

Тsankov, A., P. Stefanova (2021). Concert in the Forest. a Fairy Tale in Notes. Sofia: Fyut (*Оригинално заглавие:* Цанков, А., П. Стефанова (2021) Концерт в гората. Приказка в ноти. София: Фют).

# FRI-2.116-ERI-01

# STEM: SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS

#### 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 Tel.: +40 212 421 208 E-mail: ion.mierlusmazilu@utcb.ro

## Assoc. Prof. Emiliya Velikova, PhD

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

Abstract: STEM is a broad term that groups together four academic disciplines: science, technology, engineering, and mathematics. STEM education is the teaching of science, technology, engineering, and mathematics in an academic context. Instead of training students in any one of these domains, STEM combines all four in an interdisciplinary and applied approach, to better equip students to have a career and consider real-world applications. You'll find STEM in all levels of education, from school curriculums, college subjects, and university degrees, right through to CPD courses and professional certifications. These four subjects are typically taught through hands-on learning and real-world projects – enabling students to prepare for a job in this growing field. STEM is an umbrella term that covers a range of subjects, and many academic disciplines that fall under this category. There are many skills you'll gain from studying STEM. STEM classrooms typically focus on project-based learning. Projects and activities conducted usually involve modern technology to accentuate the practical applications of science in the near future. Students get to apply the various domains of STEM in a context that helps them realize a connection between the classroom and the world around them. In order to be minimized by the effects of pandemic, teaching staff of universities should be trained to use pedagogical and digital methods for active students and instruments that support the development of the student's personal knowledge. Through STEM, students develop key skills including: problem solving, creativity, critical analysis, teamwork, independent thinking, initiative, communication, digital literacy. In this paper we will present the DigiSTEM project. The objective is to promote innovative utilization of educational technology, learning analytics and use of open educational resources (OERs) in online, classroom and blended learning, especially in HEIs STEM subjects.

Keywords: STEM education, educational technology, learning analytics, open educational resources.

#### REFERENCES

Kinnari-Korpela, H., Korpela, A. (2014) "Enhancing learning in engineering studies: experiences on short video lecturing", *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications,* Chesapeake, VA: AACE, pp. 2207-2216.

Kirsi-Maria Rinneheimo, Hanna Kinnari-Korpela, Daniela Velichová, César Benavente-Peces, Ion Mierlus-Mazilu (2016) "Future mathematics – using technologies to improve mathematics teaching and learning in engineering studies", *Proceedings of The 18th SEFI Mathematics Working Group seminar on Mathematics in Engineering Education*, Chalmers University of Technology, Gothenburg, Sweden, Publisher: European Society for Engineering Education (SEFI), Brussels, ISBN: 978-2-87352-013-7, pp. 143-148.

Mierluș Mazilu I., Majercsik L., (2017) Teaching and learning mathematics effectively in a technology era, *Proceedings of the 14th Workshop of scientific communications, Department of Mathematics and Computer Science*, Technical University of Civil Engineering of Bucharest, Editura Matrix Rom, Bucharest, ISSN 2067-1332, pp. 78-81.

https://dmi.utcb.ro/digistem-promoting-digital-learning-in-stem-subjects/.

# QUALITY RESEARCH OF THE MOTIVATIONAL PROGRAM ON EMPOWERING SENIOR'S VOLUNTEERISMAN

#### Assoc. Prof. Emiliya Velikova, PhD

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

## Mrs. Edita Žaromskienė, Ph.D.

Kaunas Region Third Age University, Kaunas Region, Lithuania Tel.: +359-885 635 874 E-mail: edita.zaromskiene@gmail.com

## Pr. Assist. Prof. Ralitsa Vasileva-Ivanova, Ph.D.

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

Abstract: The article presents an education awarding program developed under the Erasmus+ project "Keep going, reach goals, get an award: empowering senior volunteerism" (GGA, No. 2020-1-LT01-KA204-077966; https://gogetaward.eu/). Its concept is similar to the Duke of Edinburg's Award, an international program for young people. The Award Program means motivating seniors for volunteering, helping them to find purpose in their later life, set new goals, reach them, and get an award to validate their efforts and personal achievements. Research on the quality of the program in Bulgaria, Lithuania, Slovenia, Latvia, and the Netherlands shows that it can be successfully implemented in non-formal education providers such as third age universities, libraries, adult education centres, cultural houses, local communities, small local enterprises, and volunteer accepting organizations.

Keywords: volunteerism, volunteers, award program, seniors.

# REFERENCES

Morand, T. (2019) The Top 5 Challenges Volunteer Managers Face — And What You Can Do About It.

Morand, T. (2020) How to Build an Effective Volunteer Management Plan in Six Steps. https://www.wildapricot.com/blog/volunteer-management-plan (December 2021).

Promotion of the Active Life of the Elderly in Bulgaria. Collection of good practices (2020) https://www.mlsp.government.bg/uploads/52/vazrasni-hora/ageing-v4-digital-covered-4-1.pdf (January 2022).

Research Report. Impact of transnational exchange experiences on senior volunteers and organisations (2014) http://www.alliance-network.eu/wp-content/uploads/2014/05/Final-Report-SEVEN-copia.pdf (January 2022).

Sterling Volunteers Staff (2017) 3 top volunteer management challenges – and how you can overcome them https://www.sterlingvolunteers.com/blog/2017/02/3-top-volunteer-management-challenges/ (January 2022).

Study on Volunteering in the European Union. Country Report Bulgaria (2020) national\_report\_bg\_en.pdf (europa.eu) (January 2022).

Turnbull, A. (2021) The 5 Biggest Volunteer Management Challenges You Might Face https://www.rosterfy.com/blog/the-5-biggest-volunteer-management-challenges-you-might-face (January 2022).

Velikova, E. (2021) State of the Art Review of Volunteerism, Proceedings of the 60-th Annual Scientific Conference of University of Ruse and Union of Scientists – Ruse: *New Industries, Digital Economy, Society - Projections of the Future*–IV, Book "Reports Awarded with *BEST PAPER Cristal Prize*", Copyrights© 2021 ISBN 978-954-712-864-4 (Print), p. 139-149.

Volunteering in the EU (2010) https://ec.europa.eu/citizenship/pdf/doc1018\_en.pdf, https://issuu.com/jevgenisemtsisin/docs/volunteering-in-the-european-union-english (Dec. 2021)

# INTEGRATING INTERACTIVE TOOLS IN MATHEMATICS EDUCATION

#### Silviya Petkova Toteva, MSc Student

Department of Mathematics, Faculty of Natural Sciences and Education, University of Ruse "Angel Kanchev" Tel.: +359 887531235 E-mail: toteva.sis@gmail.com

**Pr. Assist. Prof. Ralitsa Vasileva-Ivanova, PhD** Department of Mathematics, Faculty of Natural Sciences and Education, University of Ruse "Angel Kanchev" Tel.: +359 884109719

E-mail: rivanova@uni-ruse.bg

**Abstract:** The usage of interactive materials in mathematics education opens new opportunities for teachers to present it as funny and interesting. Combining classical and modern methods in teaching allows to achieve a better dynamic, both in learning and in communication between a teacher and students. Selecting the right resources leads to increased student achievement, student satisfaction, and teacher satisfaction as well. Digital tests and quizzes also bring a significant benefit to students - they are checked much faster, which means faster feedback.

The paper presents the platforms Kahoot, Quizizz and TeacherMade for tests developing, which are suitable for practice and homework, as well as for ongoing control of knowledge. Using them allows greater flexibility in the preparation of the tests themselves and different possibilities such as mixing questions and/or answers. The atmosphere in the classroom when the students solve such a test is significantly different from the usual tension after the distribution of question papers in public tests - there is euphoria, "awakening" and competitive spirit.

Examples of Kahoot, Quizizz and TeacherMade tests are given.

Keywords: Kahoot, Quizizz and TeacherMade, online tests, Geometry, innovation.

# REFERENCES

Гълъбова Д. и др. (2018), Тест Математика 7 клас, изд. Веди

Паскалева З., Алашка М. (2018), Учебник по математика за 7. клас, изд. Архимед

Паскалева З., Алашка М. (2017), Книга за ученика по математика за 7. клас, изд. Архимед

Паскалева З., Алашка М. (2018), Учебна тетрадка № 2 по математика за 7. клас, изд. Архимед

Витанов Т., А. Калчева, И. Джонджорова, М. Кьосева, П. Тодорова, (2018), Учебник по математика за 7. клас, ИК Анубис

https://kahoot.it/

https://quizizz.com/

https://teachermade.com/

# **TEACHING SYSTEM EQUATIONS BY USING GEOGEBRA**

#### Teodora Lachezarova Georgieva, MSc Student

Department of Mathematics, Faculty of Natural Sciences and Education, University of Ruse "Angel Kanchev" Tel: +359 887365881 E-mail: teodora.georgieva14@abv.bg

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

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

**Abstract:** Innovative educational technologies are a necessity dictated by the dynamic development of society. their usage implies creation of new learning environment with such an organization that stimulates and motivates the students, making the lesson more dynamic, provoking interest, which is the basis of their activity.

Systems of equations are an important part of algebra, which is studied in the 9<sup>th</sup> form of general education in mathematics. Systems of linear equations with two variables and systems of quadratic equations with two variables are represented in the training course. Students learning several methods of solving systems of equations - by substitution, by addition, as well as how to graphically represent the solution to systems of linear equations. This learning material may not be of interest to each student; therefore, some great help definitely includes innovative technologies such as GeoGebra.

This present paper introduces the platform GeoGebra for solving graphically system equations. Modern teaching resources can support the work of teachers, especially when keeping the student's attention is a difficult task. Teachers can visualize the answers of system equations using GeoGebra. New technologies are a particular interest to students, and if they are adequately included in education, they can only support it.

Keywords: GeoGebra, graphics, system equations, new technologies.

# REFERENCES

Паскалев Г., Алашка М., (2018), Учебник по математика за 9 клас, Архимед.

Тонов И., Шаркова И., Христова М., Капралова Д., Златилов В. (2018), Учебник по математика за 9 клас, Регалия 6.

Кюркчийска, В. (2020), Иновативни образователни технологии в условия на приобщаващо образование, Шуменски университет "Епископ Константин Преславски".

www.geogebra.org.

# A MODEL OF STEM - LESSON

#### Maria Spasova Ivanova-Todorova, MSc Student

Department of Mathematics, Faculty of Natural Sciences and Education, University of Ruse "Angel Kanchev" Tel.: +359 899969288 E-mail: m.spasova@sulevski-ruse.org

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

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

**Abstract:** The paper presents a model of STEM lesson. The STEM approach, through which inter-subject connections are successfully mastered, also contributes to increasing the activity and interest of students and learning the content, is described.

In  $V^{th}$  grade, the usage of a calculator is also considered - lesson "Using a calculator. Applications." Students have basic knowledge of working with a calculator from math lessons in  $IV^{th}$  grade, as well as conditional operators in block programming.

An example of a STEM lesson "Using a calculator. Applications", is described. It's for new knowledge and underlines the practical usage of addition of decimal fractions, order and properties of operations, by solving problems with a calculator. The specificity of the lesson predisposes to combining the lesson with Information Technologies, named "Creating and using a calculator".

Keywords: STEM lesson, Maths, innovation.

#### REFERENCES

Гълъбова, Д. (2019), П. Василева. Реализация на STEAM подход в обучението по физика (7. клас). – Образование и квалификация. Научно-методическо списание на ДЕПОКПС. 2019, с. 133 - 154. Велико Търново: УИ "Св.св. Кирил и Методий". ISSN: 2683-0639 Университетско издателство "Св. св. Кирил и Методий".

Георгиева С., (2018), Проблемно-творчески модел на обучението по математика в 6. Клас, АВТОРЕФЕРАТ на дисертационен труд за присъждане на образователната и научна степен "доктор", 40 с., Шумен.

https://web.mon.bg/bg/2000 Учебни програми по математика и по ИТ за 5 клас. https://web.mon.bg/bg/100835 НП "Изграждане на училищна STEM среда", 2020.

# ENTERTAINING PROBLEMS FROM GRAPH THEORY

#### Pr. 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 Tel.: +359 887 244 498 E-mail: d.georgieva@ts.uni-vt.bg

**Abstract:** The article describes how Graph Theory can be presented in an easy, accessible and engaging manner to secondary school students and thereby increase their motivation to learn the science of Mathematics. Basic theoretical knowledge from this theory is introduced in a student-friendly form. a system of entertaining tasks with drawings and solutions has been developed. New ways of visualization using modern technologies are proposed.

Keywords: Education, Graph theory, Entertaining tasks, Graph, Graph-tree, Vertices, Edges.

#### REFERENCES

Bakoev, V., (2014) Discrete mathematics: sets, relations, combinatorics, KLMN. ISBN: 9789548212052 (*Оригинално заглавие:* Бакоев, В., 2014. Дискретна математика: множества, релации, комбинаторика КЛМН).

Ganchev, I., Chimev, K. & Stoyanov, Io., (1987). Mathematical Folklore – Second Supplemented Edition Sofia: Narodna Prosveta (*Оригинално заглавие:* Ганчев, И., Чимев, К., Стоянов, Йо., 1987. Математически фолклор – второ допълнено издание София: Народна просвета).

Kolev, E. & Sabeva, N., (2016). Mathematics for advanced mathematics school for 5th, 6th, 7th grade. UNIMAT SMB (*Оригинално заглавие:* Колев, E. & Събева, H., 2016. Математика за напреднали школа по математика за 5., 6., 7. клас. УНИМАТ СМБ URL: http://www.math.bas.bg/~telecom/CV/Nevena%20CV/temi/mathadvanced.pdf).

Manev K., 2012. Introduction to discrete mathematics. Sofia:KLMN, ISBN 9789545351365 (*Оригинално заглавие:* Манев К., 2012. Увод в дискретната математика. София: КЛМН).

Millen, I., Graph Theory-II (Милен, И., Теория на графите-II https://www.academia.edu (Accessed on 16.07.2022)).

Vasileva, M., 2008. Discrete structures. Shumen: NSU "V. Levski", ISBN 978-954-9681-32-1 (*Оригинално заглавие:* Василева, М., 2008. Дискретни структури. Шумен: НВУ "В. Левски").

# APPLICATIONS OF GRAPH THEORY AND ITS ROLE IN TEACHING MATHEMATICS

#### Pr. 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 Tel.: +359 887 244 498 E-mail: d.georgieva@ts.uni-vt.bg

**Abstract:** Graph theory is widely used in various fields of human activity such as flight planning, suggesting an optimal route for movement, speeding up data transfer, event planning, surfing the Internet, marketing in social networks. These activities are described in order to motivate students to study the discipline. The role and importance of Graph Theory in mathematics education are explored. a student-friendly introduction to the theory is offered through the Königsberg Bridges problem.

**Keywords:** Education, Graph theory, Application of Graph theory, Social media marketing, Odd edges, The Königsberg Bridges problem.

#### REFERENCES

Artacho, F.J.A., Campoy, R., (2018). Solving graph coloring problems with the Douglas-Rachford algorithm. *Set-Valued and Variational Analysis* 26(2), 277–304 URL: https://www.researchgate.net/publication/311668725\_Solving\_Graph\_Coloring\_Problems\_with\_t he\_Douglas-Rachford\_Algorithm/citations (Accessed on 28.06 2022).

Gaio, A., Branchetti, L., Capone, R., (2020) Learning Math Outdoors: Graph Theory using Maps, In book: *Research on Outdoor STEM Education in the digital Age*. Proceedings of the ROSETA Online Conference in June 2020, DOI: 10.37626/GA9783959871440.0.12 URL: https://www.researchgate.net/publication/342564911\_Learning\_Math\_Outdoors\_Graph\_Theory\_u sing\_Maps.

Hadjiivanov, N., (2012). Selected studies in graph theory, Vezni-4 (*Оригинално заглавие:* Хаджииванов, Н., (2012). Избрани етюди от теория на графите, Везни-4).

Nikolov, A., 2020, course CSC473: Advanced Algorithm Design URL: http://www.cs.toronto.edu/~anikolov/CSC473W20/Lectures/Karger-Stein.pdf.

Panov, S., (2015) Interval graph recognition algorithm with simultaneous interval model building. Abstract (*Оригинално заглавие:* Панов, С., (2015) Алгоритъм за разпознаване на интервални графи с едновременно построяване на интервален модел. Автореферат на дисертация за придобиване на образователната и научна степен "доктор", София).

Rehmeyer, J., (2007) Sudoku and Graph Theory. Mathematicians find new clues to the popular puzzle, *Science News* https://www.sciencenews.org/article/sudoku-and-graph-theory (Accessed on 18.07.2022).

Stanford University, Lecture16 URL: http://web.stanford.edu/class/archive/cs/cs161/cs161.1182/Lecture16/Lecture16/compressed.pdf.

# INCLUSION OF EARLY LANGUAGE LEARNING AS COMPULSORY IN PRESCHOOL

#### Senior lecturer Ilina Ivanova

Department of Chemical, Food and Biotechnology, Razgrad Branch, Univesity of Ruse "Angel Kanchev" E-mail: iivanova@uni-ruse.bg

# Ch. Assistant Mariyka Petrova, PhD

Department of Chemical, Food and Biotechnology, Razgrad Branch, Univesity of Ruse "Angel Kanchev" E-mail: mgpetrova@uni-ruse.bg

**Abstract:** Early foreign language learning is becoming an increasingly fundamental role in the ability to speak and learn foreign languages throughout our lives. This article analyzes the need for the introduction of foreign language training as mandatory in preschool groups.

The proposal comes after a detailed study of the number of preschoolers for four consecutive school years, in a particular kindergarten, comparing how many of them attended and how many did not attend an additional pedagogical service, English. The data presented by the survey show that most parents are aware of the need for the early introduction of foreign language learning, but still remain part of them who have not realised the need for initial learning in a foreign language in the preparatory groups of the kindergarten. The current development addresses the issue of the lack of equal start for children in their foreign language education, entering the first grade of school education. On the basis of the State educational requirements and standards for the learning content in a foreign language, the authors of the article present arguments in support of the need for an equal start and the consequences of the late introduction of the foreign language into school.

**Keywords:** Foreign language learning, Motivation, Education, Equal start, English language, Larning, additional pedagogical service.

# REFERENCES

Aleksieva, K. (2020). Succession between the preparation of groups in children's hailstones and first class, Pre-education of competence-oriented education, Shumen.

Balabonova, M. (2012). *Methodical nasoki for stimulating speech activity in learning English ezik in kindergarten*, Management and Education, Volume VI (3).

Daskalova F. (1984). Psycholinguistic problems in early childhood, Blagoevgrad.

Gospodinova, Ts. (2016). *Psychological characteristics for children's age*, Godishnik, New Bulgarian University, Volume 2.

Gyurova, V., (2020). *Priorities for pre-school education - trends and pre-education*, Journal of Pedagogy, Volume 92, 21-36.

Naredba No. 5: dated 06/03/2016. for preschool education, DV, br. 46/17.06.2016.

Popova, V. A. (2000). *Psycholinguistics for Development: Cognitive Aspects and Syntactic Competence*, "St. Kliment Ohridski" UI Publishing House, "Bishop Konstantin Turnovski", Shumen, 150.

Slobin, D., Green J. (1976). Psycholinguistics, Moscow.

Stoev, L., Psychology for development and adult psychology, Sofia, 2005.

ZPUO 2015: a Pre-school and school education act (Obn. - DV, br. 79 ot 10/13/2015, v sila ot 08/01/2016 https://www.mon.bg/upload/12190/zkn\_PUObr\_180717.pdf.

https://pedagogika.bg/koya-e-naj-dobrata-vazrast-da-zapochnat-deczata-da-uchat-vtori-ezik/ https://web.mon.bg/bg/100104.

https://www.namama.bg/article/chujd-ezik--otkoga-da-zapochnem/

# FACES OF PLANE SHAPES IN MS EXCEL BY USING A CERTAIN INTEGRAL

## Ch. Assist. Mariyka Petrova, PhD

Department of Chemical, Food and Biotechnology, Razgrad Branch, Univesity of Ruse "Angel Kanchev" E-mail: mgpetrova@uni-ruse.bg

## Senior lecturer Ilina Ivanova

Department of Chemical, Food and Biotechnology, Razgrad Branch, Univesity of Ruse "Angel Kanchev" E-mail: iivanova@uni-ruse.bg

Abstract: In mathematics classes, bachelor students are taught to calculate certain integrals using a specific abstract symbolism. This development proposes the inclusion of computers in the computing process, which facilitates a deeper and lasting absorption of basic concepts, methods of solution and stimulates the interest of the learners. The proposed approach of teaching in IT classes prepares the students to successfully apply their knowledge of mathematics to solve practical tasks and participate in experimental studies of professional problems. Through appropriately selected examples, they gain an expanded understanding of what they have learned in the mathematics, with opportunities to solve entire classes of tasks of a given kind and their application in different spheres of life. The visual presentation of solutions, using graphical computer capabilities, contributes to a more durable absorption of the studied material, mastering key concepts and concepts in both mathematics and IT. The examples of training used with interdisciplinary commitment make the learning process easier and more fascinating, it is possible to automate the numerical calculations and output their graphical representation in a very short time.

Keywords: Faces of Plane Figures, Definite Integral, Interdisciplinarity, MS Excel.

# REFERENCES

Akhmadiev F.G., F.G.Gabbasov, R.F.Gizzyatov, I.V.Malanichev. (2013). *Numerical methods*, Part 2, Guidelines for laboratory and independent work in the courses "Computer Science" and "Computational Mathematics", Kazan.

Musina M.V., I. A. Lesnichevskaya. (2016). *Practice-oriented tasks in the context of the development of general professional competencies in applied mathematics*, pp 90-93, Sterlitamak, Russian Federation, International Research Agency.

Popov I. N. (2015). On the question of assignments on the topic "definite integral" for university students: the relationship between the integral and the area of the figure, Modern education: scientific approaches, experience, problems, prospects, Collection of articles of the XI International Scientific -practical conference "ARTEMOV READINGS", Penza, 85-90.

Stolbovsky A. V., M. L. Lobanov. (2018). *Mathematical modeling of processes in materials science using MS EXCEL*, Ural Federal University.

Trofimov S.P. (2015). Consolidation of the competence of checking the correctness of the solution in mathematical disciplines, New information technologies in education: materials of the VIII international scientific and practical conference, March 10-13, 2015, Yekaterinburg, 517-520.
# USE OF CLOUD TECHNOLOGIES FOR TRAINING IN MATHEMATICS OF TALENTED STUDENTS AND ADMISSION AFTER FOURTH GRADE IN HIGH SCHOOLS OF MATHEMATICS

#### Pr. Assist. Prof. Stefka Karakoleva, PhD

Department of Natural Sciences and Education, University of Ruse "Angel Kanchev" Tel.: 082-888 606 E-mail: skarakoleva@uni-ruse.bg

#### Aneliya Tosheva, MsD

Department of Natural Sciences and Education, University of Ruse "Angel Kanchev Tel.: +359898633534 E-mail: aitosheva@gmail.com

**Abstract:** The article presents the possibilities for using cloud technologies for creating digital learning resources and for conducting online tests in the teaching of mathematics in fourth grade. Through the use of the Google applications, digital learning resources have been developed, which are used through a created digital classroom. Emphasis is placed on Google applications and their ability to be used in math education.

Keywords: education, mathematics, pedagogy, training, cloud technologies, talented students, fourth grade.

## REFERENCES

Jeleva, P., (2018) Applications of cloud technologies in education, Education and technologies, volume 9, p.377-382 (Оригинално заглавие: Желева, П., Приложения на облачните технологии в обучението, Образование и технологии, том 9, c.377-382 http://www.edutechjournal.org/wp-content/uploads/2018/08/2\_2018\_377-382.pdf.

Karakoleva, S., Ivanov, S. (2020) Use of Cloud Technologies for Training and Test Control on the Topic "Elements of Probabilities and Statistics" in Seventh Grade, IN: Proceedings of University of Ruse, vol.59, book 6.1, Ruse, pp. 58-63, http://conf.uni-ruse.bg/bg/docs/cp20/6.1/6.1-9.pdf.

Karakoleva, S., Guteva, P. (2020) Use of Cloud Technologies for Training and test Control on the Topic "Basic Combinatorial Concepts" in Eighth Grade. IN: Proceedings of University of Ruse -2020, vol.59, book 6.1, Ruse, pp. 52-57, http://conf.uni-ruse.bg/bg/docs/cp20/6.1/6.1-8.pdf.

Karakoleva, S., Dimitrova, D (2021) Use of Cloud Technologies for Training and Test Control on the Topic "Statistics and Data Processing" in Tenth Grade. IN: Proceedings of University of Ruse - 2021, volume 60, book 6.4, Ruse, 2021, pp. 79-84, ISBN 1311-3321, https://conf.uni-ruse.bg/bg/docs/cp21/6.4/6.4-12.pdf.

Karakoleva, S., Shtregarska, S (2021) Use of Cloud Technologies for Training and Test Control on the Topic "Classical Probability" in Ninth Grade. IN: Proceedings of University of Ruse - 2021, volume 60, book 6.4, Ruse, 2021, pp. 85-90, ISBN 1311-3321, https://conf.uni-ruse.bg/bg/docs/cp21/6.4/6.4-13.pdf.

Sharkova, D. Garov, K. (2015) Application of Cloud Technologies in Education, Proceedings of the VIII National Conference "Education and Research in the Information Society", pp. 166-174. http://sci-gems.math.bas.bg/jspui/bitstream/10525/2454/1/ERIS2015-book-p17.pdf.

# APPLICATION OF THE FIVE-LEVEL MODEL OF TEACHING MATHEMATICS ON THE TOPIC OF GEOMETRIC PROGRESSION AND IT'S PROPERTIES

#### Iliyana Georgieva – MSc Student

Department of Mathematics, University of Ruse "Angel Kanchev" Tel.: +359876778854 E-mail: ili.gr1980@abv.bg

#### Pr. Assist. Prof. Anna Lecheva, PhD

Department of Mathematics, University of Ruse "Angel Kanchev" Tel.: +359 82 888 453 E-mail: alecheva@uni-ruse.bg

#### Assoc. Prof. Veselina Evtimova, PhD

Department of Mathematics, University of Ruse "Angel Kanchev" Tel.: +359 82 888 453 E-mail: v.evtimova@gmail.com

**Abstract:** This paper presents Geometric progression and its properties. This topic is a part of the Progressions module, which is included in the compulsory Mathematics curriculum in the 10th grade. The Five-level Mathematics teaching model suggested by A. Lecheva has been applied. The model's stages are described and relevant examples and tasks have been selected. The developed methodology is applicable for both traditional and distance education.

Keywords: Progressions, Geometric progression, Five-level teaching model

#### REFERENCES

Alashka M., Alashka R., Paskalev P., "Mathematics 10-th grade", Arhimed, 2019, (*Оригинално заглавие:* Алашка М., Алашка Р., Паскалев П., "*Математика 10 клас*", Архимед, 2019).

Georgieva I., scientific advisors Anna Lecheva and Veselina Evtimova, Number series and applications in the school course in Mathematics (2022), Master degree project, Univercity of Ruse, (*Оригинално заглавие: Числови редици и приложения в училищния курс по Математика,* Дипломен проект, Русенски университет (2022)).

Learning pyramid (October, 2021) https://www.educationcorner.com/the-learning-pyramid.html.

Lecheva, A., a five-level model of teaching mathematics based on constructivism and interactivity, PROCEEDINGS OF UNIVERSITY OF RUSE - 2021, volume 60, book 6.4, pp. 59-64 (*Оригинално заглавие:* Петстепенен модел на обучение по математика, базиран на конструктивизма и интерактивността), Научна конференция на Русенски университет (2021), том 60, книга 6.4, стр. 59-64, ISBN: 2603-4123 https://conf.uni-ruse.bg/bg/docs/cp21/6.4/6.4-9.pdf.

Ministry of Education and Science - Министерство на образованието и науката, https://www.mon.bg/.

# THE TOPIC OF GEOMETRIC PROBABILITY IN PLANE AND SPACE IN SCHOOL MATHEMATICS

#### Lidiya Petrova – MSc Student

Department of Mathematics, University of Ruse "Angel Kanchev" Tel.: +359 876 667 168 E-mail: lpetrova@vaprilov-ruse.com

#### Pr. Assist. Prof. Anna Lecheva, PhD

Department of Mathematics, University of Ruse "Angel Kanchev" Tel.: +359 82 888 E-mail: alecheva@uni-ruse.bg

#### Assoc. Prof. Veselina Evtimova, PhD

Department of Mathematics, University of Ruse "Angel Kanchev" E-mail: v.evtimova@gmail.com

**Abstract:** This paper presents Geometric probability in plane and space. It is suitable as introduction, developing the knowledge and skills of students in the module Elements of the probability theory and statistics, included in the Mathematics curriculum in 11th grade. The used teaching model allows interaction not only between the teacher and the students, but also between the students themselves. The developed instructional materials can be easily adapted for distance education.

Keywords: Geometric probability, Five-level teaching model, Mathematics competence.

#### REFERENCES

Bojadjiev L., "Higher Mathematics 4", Ciela, 1999, ISBN:954-649-232-9 (*Оригинално* заглавие: Бояджиев Л., "Висша математика 4", Сиела,1999, ISBN:954-649-232-9).

Learning pyramid (October, 2021) https://www.educationcorner.com/the-learning-pyramid.html.

Lecheva, A., a five-level model of teaching mathematics based on constructivism and interactivity (2021), PROCEEDINGS OF UNIVERSITY OF RUSE - 2021, volume 60, book 6.4, pp. 59-64 (*Оригинално заглавие:* Петстепенен модел на обучение по математика, базиран на конструктивизма и интерактивността, Научна конференция на Русенски университет (2021), том 60, книга 6.4, стр. 59-64, ISBN: 2603-4123).

Ministry of Education and Science - Министерство на образованието и науката, https://www.mon.bg/.

Paskaleva Z., "Mathematics 9-th grade – general education", Arhimed, 2018 (*Оригинално заглавие:* Паскалева З., "*Математика 11 клас – общообразователна подготовка*", Архимед, 2018, ISBN: 978-954-779-213-5).

Petrova, L., scientific advisors Anna Lecheva and Veselina Evtimova, Theory of probabilities and statistics in the school course in Mathematics (2022), Master degree project, Univercity of Ruse, (*Оригинално заглавие: Теория на вероятностите и статистиката в училищния курс по Математика*, Дипломен проект, Русенски университет (2022)).

Sugarev Z., "Probability theory", Science and Art, Sofia, 1974 (*Оригинално заглавие:* Сугарев З., "*Теория на вероятностите*", Наука и изкуство, София, 1974).

# THE TOPIC OF PROBABILITY OF THE SUM OF COMPATIBLE EVENTS IN THE 9<sup>TH</sup> GRADE MATHEMATICS CURRICULUM

#### Lidiya Petrova – MSc Student

Department of Mathematics, University of Ruse "Angel Kanchev" Tel.: +359 876 667 168 E-mail: lpetrova@vaprilov-ruse.com

#### Pr. Assist. Prof. Anna Lecheva, PhD

Department of Mathematics, University of Ruse "Angel Kanchev" Tel.: +359 82 888 453 E-mail: alecheva@uni-ruse.bg

#### Assoc. Prof. Veselina Evtimova, PhD

Department of Mathematics, University of Ruse "Angel Kanchev" Tel.: +359 82 888 453 E-mail: v.evtimova@gmail.com

**Abstract:** This paper presents the Probability of the sum of compatible events. Relevant examples and tasks have been selected to demonstrate the theory behind it. The solutions have been presented analytically and graphically. The topic is part of the module Elements of the probability theory and statistics, included in the compulsory Mathematics curriculum in 9th grade. The presented teaching method contributes to the development of constructive thinking, the ability of expressing thoughts, the ability to clearly and precisely structure knowledge, the ability to communicate with others and self-expression.

Keywords: Probability, Probability of a sum of compatible events, Five-level teaching model.

#### REFERENCES

Војаdjiev L., "Higher Mathematics 4", Ciela, 1999, ISBN: 954-649-232-9 (*Оригинално* заглавие: Бояджиев Л., "Висша математика 4", Сиела, 1999, ISBN: 954-649-232-9)

Lecheva, A., a five-level model of teaching mathematics based on constructivism and interactivity, PROCEEDINGS OF UNIVERSITY OF RUSE - 2021, volume 60, book 6.4, pp. 59-64 (**Оригинално заглавие:** Петстепенен модел на обучение по математика, базиран на конструктивизма и интерактивността), Научна конференция на Русенски университет (2021), том 60, книга 6.4, стр. 59-64, ISBN: 2603-4123

Ministry of Education and Science - Министерство на образованието и науката, https://www.mon.bg/

Paskaleva Z., "Mathematics 9-th grade – general education", Arhimed, 2018, (*Оригинално заглавие:* Паскалева З., "*Математика 9 клас – общообразователна подготовка*", Архимед, 2018)

Petrova, L., scientific advisors Anna Lecheva and Veselina Evtimova, Theory of probabilities and statistics in the school course in Mathematics (2022), Master degree project, Univercity of Ruse, (*Оригинално заглавие: Теория на вероятностите и статистиката в училищния курс по Математика*, Дипломен проект, Русенски университет (2022))

Sugarev Z., "Probability theory", Science and Art, Sofia, 1974 (*Оригинално заглавие:* Сугарев З., *"Теория на вероятностите"*, Наука и изкуство, София, 1974)

# CREATING E-TESTS IN MATHEMATICS IN 8<sup>TH</sup> GRADE FOR DISTANCE LEARNING IN AN ELECTRONIC ENVIRONMENT

#### Evelina Cankova, MSc Student

Department of Mathematics, University of Ruse "Angel Kanchev" Tel: +359 88 658 8994 E-mail: eva\_8@abv.bg

#### Assoc. Prof. Antoaneta Mihova, PhD

Department of Mathematics, Faculty of Natural Sciences and Education University of Ruse "Angel Kanchev" Tel.: +359 88 781 2896 E-mail: amihova@uni-ruse.bg

Abstract: The article examines the difficulties that students face when learning irrational numbers and presents two tests on the topic of square root in the 8th grade. The tests are implemented using the online form creation tool Google Forms.

Keywords: School education, distance learning in an electronic environment.

#### REFERENCES

Витанов Т., Г. Кожухаров, М. Кьосева, К Узунова, Учебник по Математика за 8 клас, Анубис, 2017.

Банков К., Т. Стоева, И. Цветкова, Д. Петрова, Учебник по Математика\_за 8 клас, Просвета – София, първи тираж, 2021.

Рангелова П., Г. Бизова, М. Терзиева, Сборник за 8 клас – Тестове за контролни работи, Коала прес, 2009.

# APPLICATION OF THE "GEOGEBRA" PLATFORM IN THE THEACHING OF SOLIDS IN 5<sup>TH</sup> AND 6<sup>TH</sup> GRADES

#### Jorjeta Kraleva, MSc Student

Department of Mathematics, University of Ruse "Angel Kanchev" Tel: +359 88 724 6230 E-mail: neustoimo@gmail.com

#### Assoc. Prof. Antoaneta Mihova, PhD

Department of Mathematics, Faculty of Natural Sciences and Education University of Ruse "Angel Kanchev" Tel.: +359 88 781 2896 E-mail: amihova@uni-ruse.bg

*Abstract:* The report examines the use of the "GeoGebra" platform in the theaching of solids in 5<sup>th</sup> and 6<sup>th</sup> grades. The possibilities of the offline platform for working in class and for checking knowledge are described. *Keywords:* School education, GeoGebra.

#### REFERENCES

Паскалева З., М. Алашка, Р. Алашка, Учебник по Математика за 5 клас, Архимед, 2016, стр. 232-256.

Паскалева З., М. Алашка, Р. Алашка, Учебник по Математика за 6 клас, Архимед, 2016, стр. 32-86.

https://www.geogebra.org/about, юни, 2022.

https://www.geogebra.org/download, юни, 2022.

https://www.geogebra.org/en/Tutorials, юни, 2022

https://www.geogebra.org/classic, юни, 2022.

# BASIC METHODS OF SOLVING TRIGONOMETRIC EQUATIONS STUDIED IN SCHOOL

#### Todorka Ivanova, MSc Student

Department of Mathematics, University of Ruse "Angel Kanchev" Tel: +359 88 733 6596 E-mail: tuciiv@gmail.com

#### Assoc. Prof. Antoaneta Mihova, PhD

Department of Mathematics, University of Ruse "Angel Kanchev" Tel.: +359 88 781 2896 E-mail: amihova@uni-ruse.bg

**Abstract:** The article discusses the main types of trigonometric equations studied at school and methods of solving them. Each described method is illustrated with examples. their advantages and disadvantages are presented and practicable recommendations are made.

Keywords: School education, trigonometric equations.

#### REFERENCES

Алашка Р., Алашка М., Паскалев П., Учебник по математика за 12. клас, Архимед, 2020.

Корянов А.Г., Прокофьев А.А. Тригонометрические уравнения: методы решений и отбор корней. Математика ЕГЭ 2012 (типовые задания С1).

Портев, Л. Б., Иванов, И. С., Иванов, Й. Н., Първулов, С. С., & Трайчев, Т. Л. (2002). Методическо ръководство за семинарни упражнения по методика на математика. Шумен: Унив. изд. Епископ Константин Преславски.

Тулемисова Д.З. Тригонометрические уравнения. Методы и приемы их решения

https://lektsii.org/1-17877.html. (юни 2022)

https://math.bobrodobro.ru/8479 (юни 2022)

https://mathus.ru/math/trigonur.pdf. (юни 2022)

https://znanio.ru/media/nauchnaya-rabota-2493004. (юни 2022)

# EXTREMAL PROBLEMS IN GEOMETRY OR HOW SIGNIFICANT IS THE CHOICE OF THE PARAMETERS

#### **Dimitar Rosenov Chaparov**

Applied Mathematics Student, Sofia University "St. Kliment Ohridski" E-mail: dim.chaparov@gmail.com

#### Assoc. Prof. Julia Chaparova, PhD

Department of Mathematics, University of Ruse "Angel Kanchev" E-mail: jchaparova@uni-ruse.bg

**Abstract:** The paper deals with finding extremes for geometric models that could arise in geometric optics, instruments design, construction, shipping, etc. The essentials of such kind of problems are among the set of geometric objects to choose one whose particular element (segment, angle, area) is minimal or maximal. The key role in the investigation is the choice of the parameter with respect to which the particular element has evaluated. It is interesting to note that the choice of the parameter is not unique and often there is no reason in choosing it. Generally speaking, if the corresponding function that evaluates the particular element with respect to a parameter is too complicated for extremes examination it is better to choose another parameter. The most efficient (according to the authors) solutions are presented to some examples as well as other choices of the parameters are commented in subsequent remarks since it is not initially known which one of the parameters will bring to the efficient (or possible) solution.

Keywords: Geometric models, Finding of extremes, Parameterization.

## FRI-2G.510-1-ESIS1-01

# JUDEO-CHRISTIANITY AND CHRISTIAN ZIONISM

## **Prof. DSc Vladimir Chukov**

PhD programme in Political Science Faculty of Business and Management University of Ruse "Angel Kanchev" Tel. 0889 768745 E-mail: vlachu1@gmail.com

Abstract: The terms "Judeo-Christianity" and "Christian Zionism" have a long and controversial history. The adjective "Judeo-" was coined to denote a hybrid phenomenon, such as identifying the Yiddish language as "Judeo-German" or "Judeo-Polish". The term is widely used (in French as well as in English) to refer to the early followers of Jesus who opposed the apostle Paul in wanting to limit Jesus' message to the Jews. They bring to the fore their demand in God's message that Jewish law and ritual be maintained. In this way, "Judeo-Christianity" began to sound synonymous with two of the Abrahamic religions, viz. God's conversion to all who are at the same time followers of Judaism, with its already established canons, and to the newly emerging Christianity

Keywords: Religion, Christianity, Judeo, Zionism, Messianism JEL Codes: Z28

## REFERENCES

Ryrie, C., Dispensationalism, Revised and Expanded, Moody Publishers, 2007, cit by Your Questions. Biblical Answers, https://www.gotquestions.org/dispensational-premillennialism.html, 29.04.2020.

Inbari, M., Bumin, K., M., G., Byrd, Why do Evangelicals Support Israel, Politics and Religion, Cambridge University Press, January 2020,

https://www.researchgate.net/publication/338583810\_Why\_Do\_Evangelicals\_Support\_Israel, 29.04.2020.

Jeremie, 30:7, Saint Bible, https://saintebible.com/jeremiah/30-7.htm, 29.04.2020.

Boyer, P., When Time Shall Be No More. Cambridge: Harvard University Press, 1992, pp. 254-290.

# **EUROPEAN (IN)SECURITY**

#### Assoc. Prof. Mimi Kornazheva, PhD

PhD Programme in Political Science Faculty of Business and Management University of Ruse "Angel Kanchev", Bulgaria E-mail: mkornazheva@uni-ruse.bg

**Abstract:** The study compares two periods of European (in)security on the grounds of post-Second World War and post-Cold War diachronic analysis. Conclusions provide synthesis of similarities and differences.

*Keywords:* European security, European defence, European army, war and peace *JEL Codes:* F52, F53

#### REFERENCES

A short history of NATO. // <http://www.nato.int/history/nato-history.html> accessed 3 April 2015

Bucharest Summit Declaration. Issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Bucharest on 3 April 2008.// https://www.nato.int/cps/en/natolive/official\_texts\_8443.htm

Casale, D. EU Institutional and Legal Counter-terrorism Framework, Defence Against Terrorism Review, Vol. 1, No. 1, Spring 2008, 49-78

Churchill's speech at the University of Zurich //

<http://www.coe.int/t/dgal/dit/ilcd/Archives/selection/ Churchill/ Zurich Speech\_en.asp> accessed 27 March 2015

Dickinson, P. The 2008 Russo-Georgian War: Putin's green light.//Atlantic council. August 7, 2021.// https://www.atlanticcouncil.org/blogs/ukrainealert/the-2008-russo-georgian-war-putins-green-light/

European Commission, European External Action Service. a New Response to a Changing Neighbourhood: a Review of European Neighbourhood Policy. Brussels: COM (2011) 303, 25.05.2011

European Commission, High Representative of the EU for Foreign Affairs and Security Policy. Implementation of the European Neighbourhood Policy in 2012 Statistical Annex. Brussels: SWD(2013) 87 final, 20.3.2013.

European Defence Community (2012) //Teasdale A. and T. Bainbridge. The Penguin Companion to European Union. Fourth Edition, London: Penguin Books

Ewen MacAskill, Donald Trump arrives in UK and hails Brexit vote as 'great victory', The Guardian, 24 June, 2016.

Giulia Carbonaro. Russian TV Says Poland Next Target for Invasion, Newsweek, 6/1/22 at 6:55 AM EDT// https://www.newsweek.com/russian-tv-says-poland-next-target-invasion-1711967

Glass, Andrew (2010). *Bernard Baruch coins term 'Cold War,' April 16, 1947// <*http://www.politico.com/news/ stories/0410/ 35862.html>

Greek Civil War. //< http://www.globalsecurity.org/military/world/war/greek.htm>

Judt, T. (2006)Post-war: a History of Europe since 1945, Penguin Books; Reprint edition

Julian E. Barnes and Helene Cooper. Trump Discussed Pulling U.S. from NATO, Aides Say Amid New Concerns Over Russia, The New York Times Jan. 14, 2019

Juncker: NATO is not enough, EU needs an army. <a href="http://www.euractiv.com/sections/global-europe/juncker-nato-not-enough-eu-needs-army-312724">http://www.euractiv.com/sections/global-europe/juncker-nato-not-enough-eu-needs-army-312724</a>> accessed 9 April 2015

Kaiser, W. (2007) Cristian Democracy and the Origins of European Union. Cambridge University Press

Kennan and Containment, 1947//<https://history.state.gov/milestones/1945-1952/kennan> accessed 28 March 2015

Larres, K. North Atlantic Treaty Organization. Encyclopedia of American Foreign Policy, 2002// http://< www.encyclopedia.com/topic/North\_Atlantic\_Treaty\_Organization.aspx>accessed 3 April 2015

Milestones: 1945–1952//< https://history.state.gov/milestones/1945-1952/nato>accessed 3 April 2015

Mimosa Spencer and Elizabeth Pineau. Gazprom says it will halt gas supplies to France's Engie, cites lack of payment. Reuters, August 31, 202212:48 AM GMT+5

"Moldova belongs in the European Union" says President Maia Sandu. Press Releases. Plenary session 18-05-2022 - 15:40 // https://www.europarl.europa.eu/news/en/pressroom/20220517IPR29930/moldova-belongs-in-the-european-union-says-president-maia-sandu

Nathalie Nougayère, a chaotic Brexit is part of Trump's grand plan for Europe, The Guardian, 14 March 2019.

Nye, J. S. Jr.,2008. Public Diplomacy and Soft Power. The ANNALS of the American Academy of Political and Social Science, 616(94) [pdf]

Organization for European Economic Cooperation. // <http://www.oecd.org/general/organisationforeuropeaneconomic co-operation.htm >accessed 3 April 2015

OriginsoftheNorthAtlanticTreaty//<</th>http://www.nato.int/archives/1st5years/chapters/1.htm>accessed 2 April 2015Treaty//Treaty//

Pistone, S. (2008)The Union of European Federalists: from the Foundation to the Decision on Direct Election of the European Parliament (1946-1974), Giuffrè Editore

President Harry Truman's Address before a Joint Session of Congress, March 12, 1947 //http://avalon.law.yale. edu/20th\_ century/ trudoc.asp> accessed 30 March 2015

PM Garibashvili: Georgia's "European choice" has "no alternative".// https://agenda.ge/en/news/2022/1645

Romain Geoffroy and Maxime VaudanoWhat are Marine Le Pen's ties to Vladimir Putin's Russia?, Le Monde, published on April 21, 2022 at 14h54, updated at 15h31 on May 30, 2022

Speech delivered by J. V. Stalin at a meeting of voters of the Stalin electoral district, Moscow //<htp://www.marx2mao.com/Stalin/SS46.html> accessed 27 March 2015

Szyszkowitz T. (2005), The European Union, in von Hippel K. (ed.), Europe Confronts

Terrorism, Houndmills, Basingstoke [etc.], Palgrave Macmillan

The Marshall Plan for Rebuilding Western Europe //<http://www.crf-usa.org/bill-of-rightsin-action/bria-20-3-a-the-marshall-plan-for-rebuilding-western-europe.html> accessed 31 March 2015

TheNovikovtelegram,27September,1946//<http://academic.brooklyn.cuny.edu/history/johnson/novikov.htm>accessed 29 March 2015

The UN and the war in Ukraine: key information.// https://unric.org/en/the-un-and-the-war-in-ukraine-key-information/

Union of European Federalists. History.//<http://www.federalists.eu/uef/history/> accessed 30 March 2015

Van Dijk R., W.G.Gray, S. Savranskaya, J. Suri, Q. Zhai, Encyclopedia of the Cold War.Routledge, 2013

White, T. (1953) Fire in the Ashes: Europe in Mid-century, Publisher: Sloane

Why has the Syrian war lasted 11 years? 15th March, 2022.// https://www. bbc.com/news/world-middle-east-35806229

Willis, F. R. (1968) France, Germany and the New Europe, 1945-1967. Stanford University Press; Rev. and expanded edition

Wivel, A. and H. Mouritzen (2004). The Geopolitics of Euro-Atlantic Integration. Routledge

Владимир Путин: "Распад СССР - крупнейшая геополитическая катастрофа века", 25 април 2005 г.// https://regnum.ru/news/economy/444083.html

Интервю на Весела Владкова с Ерхард Бусек пред БНР.// https:// bnr.bg/radiobulgaria/post/100970849/erhard-busek-bruksel-nai-nakraa-osazna-che-zapadnitebalkani-imat-kluchovo-znachenie-za-evropa

Катранджиев, В.(2011) Външната политика на Европейския Съюз. Военно издателство

Корнажева, М., С. Кирова (2013) Актуални предизвикателства пред европейската политика за съседство //Научни трудове на Русенски университет, том 52, серия 5.2. Европеистика, Русе, 2013, с.61-67, ISSN:1311-3321

Отговор на ЕС на руското нашествие в Украйна.// https://www. consilium.europa.eu/bg/policies/eu-response-ukraine-invasion/

Пълната реч на Путин, с която даде старт на войната срещу Украйна. // https://www.actualno.com/europe/pylnata-rech-na-putin-s-kojato-dade-start-na-vojnata-news\_1715956.html © Actualno.com

Чуков, В. (2016) Идил. (Не)ислямска държава. Изток-Запад. София

# THE HYBRID THREATS OF THE 21ST CENTURY – DEFINITION AND MEANINGS

**Pr. Assist. Prof. Krasimir Koev, PhD** Department of Security Faculty of Law University of Ruse "Angel Kanchev", Bulgaria 8, Studentska St, Ruse 7017 E-mail: kgkoev@uni-ruse.bg

**Abstract:** This paper presents and discusses some points of view about the hybrid warfare and hybrid threats nowadays. The different meanings of the concept "hybrid warfare" are presented and analyzed on the basis of topical publications in the field. All examples in the paper are connected with the recent geopolitical situation and its reflection on the global security.

*Keywords:* Hybrid Warfare, Hybrid Theats, Cyber Security, Global Security. *JEL Codes:* Z28

#### REFERENCES

Bilal, A. (2021) Hybrid Warfare – New Threats, Complexity, and 'Trust' as the Antidote. https://www.nato.int/docu/review/articles/2021/11/30/hybrid-warfare-new-threats-complexity-and-trust-as-the-antidote/index.html (Accessed on 09.08.2022).

Deep, A. (2015) Hybrid War: Old Concept, New Techniques. *Small Wars Journal*. https://smallwarsjournal.com/jrnl/art/hybrid-war-old-concept-new-techniques (Accessed on 15.08.2022)

Popescu, N. (2015) Hybrid Tactics: Neither New nor Only Russian. European Union Institute for Security Studies, EU-ISS-ALERT https://www.iss.europa.eu/ sites/default/files/EUISSFiles/Alert\_4\_hybrid\_warfare.pdf (Accessed on 15.08.2022)

Solmaz, T. (2022) Hybrid Warfare: One Term, Many Meanings. https:// smallwarsjournal.com/jrnl/art/hybrid-warfare-one-term-many-meanings (Accessed on 10.08.2022)

Wigglesworth, R., C. Smith and C. Jones. (2022) The West's hybrid war on Russia. https://www.ft.com/content/ff95ee3f-a1b8-4a54-9657-6a1aaecc105f (Accessed on 10.08.2022)

# CHALLENGES RELATED TO ADMISSION OF INTERNATIONAL STUDENTS IN BULGARIA: A CASE STUDY FROM BRIE<sup>2</sup>

## Eva Parvanova, PhD

PhD programme in Political Science, Faculty of Business and Management, University of Ruse "Angel Kanchev" Tel.: +359 8282 888 375 E-mail: eparvanova@uni-ruse.bg

**Abstract:** The paper examines problems related to admission of foreign candidates to Bulgarian universities. The obstacles are of political and legal character. All of them are demotivating for candidates and impact negatively recruitment. The paper explores a particular case study with a candidate from Eritrea who has applied for the master program European Studies and Public Administration at Bulgarian-Romanian Interuniversity Europe Center (BRIE). The centre was founded in 2002 and has provided education for more than 200 students from 16 countries.

*Keywords*: International Education, Degree Recognition, International Relations. Jel: F59

#### REFERENCES

Country Reports https://www.countryreports.org/country/Eritrea.htm [retrieved on 12.08.2022]

Education System of Eritrea: Described and Compared with the Dutch System. NUFFIC: the Dutch organization for internationalization of education www.nuffic.nl\_[retrieved on 03.08.2020]

Eritrea – Refugees Country Briefing. Produced by the ENIC-NARIC centres of France, Italy, the Netherlands, Norway and the United Kingdom with the support of the European Commission, April 2017

https://www.nokut.no/contentassets/5751a837c39042b08776c0eacf416e41/country\_briefing\_eritr ea\_2017.pdf [retrieved on 08.08.2020]

Foreigners in the Republic of Bulgaria Act (*Оригинално заглавие: Закон за чужденците* в *Penyблика България*) https://www.lex.bg/laws/ldoc/2134455296 [retrieved 23.08.2022]

Kornazheva, M. Bulgarian-Romanian Interuniversity Europe Center. //Higher Education Reform Projects in South-Eastern Europe. HRK Commitment 1999-2006. Bonn, 2007. pp 78 – 86, ISBN: 3-938738-35-9

Official page of Bulgarian-Romanian Interuniversity Europe Center http://brie.uniruse.bg/en/pages/master-of-european-studies-and-public-administration/application/applicationrequirements.php [retrieved 19.08.2022]

Official page of Ministry of Foreign Affairs of Bulgaria www.mfa.bg [retrieved 15.08.2022]

Procedural Rules for Recognition in compliance with the State Requirements for a University Degree or Study Period Adopted in a Foreign Country with the aim of Continuing Education at University of Ruse (*Оригинално заглавие*: Процедурни правила за признаване в съответствие с държавните изисквания на придобита в чужбина степен на висше образование или период на обучение, завършени в чуждестранни висши училища, с цел продължаване на обучението в Русенския университет) https://local.uni-ruse.bg/docs/word/ndo\_29\_2022.pdf [retrieved on 21.08.2022]

University Rankings: Adi-Keih College of Arts and Social Sciences https://www.4icu.org/reviews/18642.htm [retrieved on 01.08.2020]

<sup>&</sup>lt;sup>2</sup> Bulgarian-Romanian Interuniversity Europe Center *www.brie.uni-ruse.bg* 

## FRI-2G.510-1-ESIS2-01

# FOUNDING AND DEVELOPMENT OF INTERNATIONAL ELIAS CANETTI SOCIETY

#### Viktor Kirilov, PhD student

PhD programme in Political Science Faculty of Business and Management, Univesity of Ruse "Angel Kanchev" Tel.: +359 87 928 9719 E-mail: viktor.kirilov@eliascanetti.org

**Abstract:** The paper explores International Elias Canetti Society (IECS). The INGO was founded to preserve the cultural legacy of Canetti. In the course of uts development its profile has expanded to include management of cultural events, civic education, research and publishing. The analysis is based on data, collected from annual reports, archive of IECS, media publications. The findings provide a synthesis, related to the added value of the organization for strengthening of civil society in Bulgaria and Europe-wide.

*Keywords: civil society, transnational civil sociey Jel:* A13

## REFERENCES

Angelova, P., M. Kornazheva and J. Popova. (2000). *Bulgarian-Romanian Interuniversity Europe Center*. Ruse university press.

Ангелова, П. (2006). Елиас Канети 1905-2005 Слуховидецът на века.

Преспапки на МД Елиас Канети 2007-2022

Онлайн архив на МД Елиас Канети Архив – International Elias Canetti Society

# CLAIMS OF (NON-)DISCRIMINATION BY THE TURKISH LINGOCULTURAL COMMUNITY IN BULGARIA

Esin Veysalova-Miteva, PhD student PhD Programme in Political Science Faculty of Business and Management, Univesity of Ruse "Angel Kanchev" Phone: 0893205487 E-mail: eveysalova@uni-ruse.bg

**Abstract:** In the period from 1878 to 1989 the Turkish linguocultural community in Bulgaria experienced both discrimination and non-discrimination practices, incl. a complete isolation within a so called vazroditelen process. After 1989 in the context of western foreign policy orientation of the country, a new model of governance of cultural diversity was adopted. Important reforms were implemented such as restoration of names, representation in parliament, opportunity to practice one's own religion and traditions, use of "mother tongue", etc. The paper finds out, that today representatives of the community are more likely to state, that practices of discrimination decrease, and those of non-discrimination increase.

*Keywords:* Cultural diversity, Turkish linguacultural community, Discrimination, Non-discrimination. *Jel:* A13

## REFERENCES

Advisory Committee on the Framework for the Protection of National Minorities (2020), Forth Opinion on Bulgaria: *Report adopted on 26 May 2020*.

Council of Europe (1995), Strasbourg, Framework Convention for the Protection of National Minorities. URL: https://rm.coe.int/16800c10cf

Republic of Bulgaria (2021), Sofia, Fifth Report submitted by Bulgaria: *Pursuant to art. 25* (2) of the Framework Convention for the Protection of National Minorities.

Veysalova-Miteva, E. (2022) Survey of the Turkish linguacultural communities' opinion about the Bulgaria's policy relative to them: *results*. URL:

https://docs.google.com/forms/d/13w\_t2vesVS03zgr-

OBQalEMVWVNWzh\_19PTyrWpTmi8/edit#responses

# POTENTIAL OF EU MULTI-LEVEL GOVERNANCE FOR STRENGTHENING THE PROTECTION OF CULTURAL DIVERSITY IN BULGARIA

## Esin Veysalova-Miteva, PhD student

PhD Programme in Political Science Faculty of Business and Management, Univesity of Ruse "Angel Kanchev" Phone: 0893205487 E-mail: eveysalova@uni-ruse.bg

**Abstract:** Multi-level governance (MLG) is the practice of identifying and solving various societal problems through coordination between the decision-making bodies and civil society at three territorial levels in the EU – supranational, national and sub-national (regional and local). The paper explores policies related to protection of cultural diversity and identifies the potential of MLG to strengthen their positive impact on the Turkish linguocultural community in Bulgaria.

*Keywords: Cultural Diversity, EU Multilevel Governance. Jel:* A13

## REFERENCES

Advisory Committee on the Framework for the Protection of National Minorities (2020), Forth Opinion on Bulgaria: *Report adopted on 26 May 2020*.

Council of Europe (1995), Strasbourg, Framework Convention for the Protection of National Minorities. URL: https://rm.coe.int/16800c10cf

# EUROPEAN TERRITORIAL COOPERATION AND TERRITORIAL CAPITAL

#### Svetla Andonova, PhD student

PhD Programme in Political Science, Faculty of Business and Management, Univesity of Ruse "Angel Kanchev" Tel.: 0887 742070 E-mail: sandonova@uni-ruse.bg

**Abstract:** a previous publication analysed EU cohesion policy as a territorial approach to development. It concluded, that the policy aims at the achievement of two terminal goals (economic&social cohesion, territorial cohesion) and one instrumental goal - territorial cooperation. This paper continues the conceptual analysis. It argues, that the political framework of European territorial cooperation (1) enables the identification of territorial capital and (2) harnesses the identified territorial capital to deliver cohesion policy outcomes.

*Keywords:* European territorial cooperation, territorial capital, cohesion policy *JEL Code*: Z18

#### REFERENCES

Balázs István Tóth (2015) Territorial Capital: Theory, Empirics and Critical Remarks, European Planning Studies, 23:7, 1327-1344, DOI: 10.1080/09654313.2014.928675

Camagni, R. (2009). Territorial capital and regional development. In R. Capello, & P. Nijkamp (Eds.), Handbook of regional growth and development Theories (pp. 118–132). Cheltenham: Edward Elgar.

Christiaan van Lierop (2020). Thirty years of European territorial cooperation.

European Commission. (2005). Territorial state and perspectives of the European Union, Scoping document and summary of political messages (May). Brussels: European Commission.

Fratesi, U., & Perucca, G. (2014). Territorial capital and the effectiveness of cohesion policies: An Assessment for CEE regions. Investigaciones Regionales: Journal of Regional Research, 29, 165–191.

Fratesi, U., & Perucca, G. (2016). *Territorial capital and EU Cohesion Policy. In J. Bachtler, P. Berkowitz, S. Hardy, & T. Muravska (Eds.), EU Cohesion Policy: Reassessing performance and direction (pp. 255–270). Abingdon: Routledge.* 

Fratesi, U., & Perucca, G. (2018a). *Territorial capital and the resilience of European regions*. *Annals of Regional Science*, 60(2), 241–264. doi: 10.1007/s00168-017-0828-3

Fratesi, U., & Perucca, G. (2018b). EU regional development policy and territorial capital: a systemic approach. Papers in Regional Science. doi: 10.1111/pirs.12360

Margaras V. (2020) Cross-border regional healthcare cooperation to combat the Coronavirus pandemic, EPRS, European Parliament.

Nicholas C., L. Dijkstra, V. Lapuente (2014) Regional Governance Matters: Quality of Government within European Union Member States. January 2014, Regional Studies 48(1) DOI:10.1080/00343404.2013.770141

OECD Territorial Outlook, Territorial Economy, 2001

Perucca, G. (2013). a redefinition of Italian macro-areas: The role of territorial capital. Rivista di Economia e Statistica del Territorio, 2, 37–65. doi: 10.3280/REST2013-002003

Roberto Camagni & Roberta Capello (2013) Regional Competitiveness and Territorial Capital: a Conceptual Approach and Empirical Evidence from the European Union, Regional Studies, 47:9, 1383-1402, DOI: 10.1080/00343404.2012.681640

Van Lierop C. (2020) European territorial cooperation 2021-2027, EPRS, European Parliament.

Kornazheva, M. (2022) The Subnational Level in EU Multi-level Governance. Dema Press, Ruse, ISBN 978-619-7546-70-5. Корнажева, М. (2022) Субнационалното равнище в многостепенното управление на Европейския съюз. Дема прес ООД. Русе. ISBN 978-619-7546-70-5.

# READING PRACTICES IN THE DIGITAL ERA. DOWNLOADING AND COPYING OF BOOKS IN THE CONTEXT OF THE DILEMMA INTELLECTUAL RIGHTS - ACCESS TO CULTURE

## Vanya Georgieva, PhD student

PhD programme in Political Science Faculty of Business and Management, Univesity of Ruse "Angel Kanchev" Tel.: 0896844645 E-mail: vgeorgieva@uni-ruse.bg

**Abstract:** The paper explores the major changes in society due to the upsurge of digital technologies embedded and impacting the social and cultural context of everyday practices. The transformations of cultural consumption and reading practices in particular are one side of the coin. On the other side are the changes in public relations that ground the so-called economy of knowledge and call for a new concept addressing the universal right of access to culture. Representative empirical data for the adult population of Bulgaria are presented in the paper that reflect practices of downloading and copying book, including the illegal use of free intellectual resourcec. Analyzed data highlight key perceptions that could navigate the discussion and help build a balanced strategy that is both inclusive for society and protective for authors and publishers.

*Keywords:* culture, books, reading practices, digitalization *JEL Codes:* Z18

## REFERENCES

Kabakov, I. (2015). Dilemmas of culture, Sofia: UI

Sv. Kliment Ohridski (*Оригинално заглавие:* Кабаков, И., 2015, Дилеми на културата, София, Университетско издателство "Св. Климент Охридски")

Кавакоv, I. (2014). Access to cultural content. Ideas in Management and Culture Policies 2007-2013, Sofia: UI Sv. Kliment Ohridski (*Оригинално заглавие:* Кабаков, И., 2014, Достъп до културно съдържание. Идеи в мениджмънта и политиките за култура 2007-2013, съст. Иван Кабаков, София, Университетско издателство "Св. Климент Охридски")

Sotirova, K., (2014)., Digitization of cultural heritage - access and long-term preservation. Ideas in Management and Culture Policies 2007-2013, Sofia: UI Sv. Kliment Ohridski (*Оригинално заглавие:* Сотирова, К., 2014, Дигитализация на културното наследство – достъп и дългосрочно съхранение. Идеи в мениджмънта и политиките за култура 2007-2013, съст. Иван Кабаков, София, Университетско издателство "Св. Климент Охридски")

# 2022 ELECTIONS IN ITALY: HOW THE FAR-RIGHT USED POPULIST NARRATIVE TO WIN THE ELECTION?

## Marin Nikolov, PhD student

PhD Programme in Political Science, Faculty of Business and Management, Univesity of Ruse "Angel Kanchev" Tel.: +359 888 275 673 E-mail: manikolov@uni-ruse.bg

Abstract: This paper aims to answer the question how the far-right political parties in Italy used populist narratives to win the 2022 elections. This election result likely means that Italy will have its first far-right government since the end World War II. Pre-election promises of coalition partners pose a significant threat to Italy's democratic standing and its commitment to European values. The paper argues that right-wing leaders in Italy, namely Giorgia Meloni and Matteo Salvini successfully used anti-elitist, anti-democratic and anti-European sentiment among Italian voters in order to gather electoral support. The paper attempts to make a prediction on whether the far-right coalition will maintain its conservative positions or it will turn progressively to the mainstream, as it is often the case for farright populist parties once they become part of the ruling government.

Keywords: Populism, Italy, Elections JEL Code: A19

#### REFERENCES

Ardissianno, Elettra & Jones, Eric. Why America and the EU Should Root for a Far-Right Populist. Foreign Affairs, 21 September 2022, https://www.foreignaffairs.com/europe/italys-election-

paradox?utm\_medium=newsletters&utm\_source=fatoday&utm\_campaign=The%20Alternate%20 History%20of%20China&utm\_content=20220921&utm\_term=FA%20Today%20-%20112017.

Carlo, Andrea. Italy election explained: Who is running? How does it work? Who is likely to win? Euronews, 27 September 2022, https://www.euronews.com/my-europe/2022/09/23/italy-election-explained-why-now-who-is-running-how-does-it-work-who-is-likely-to-win

Feo, Franchesca & Laviazzi, Anna. Triumph of the women? The female face of right-wing populism and extremism. Case Study Italy, Friedrich-Ebert-Stiftung, 2021.

Zanotti, Lisa & Melandez, Carlos. Survey evidence: Are Fratelli d'Italia voters less democratic than supporters of other Italian parties? The London School of Economics and Political Science, 28 Sepetember 2022, https://blogs.lse.ac.uk/europpblog/2022/09/28/survey-evidence-are-fratelli-ditalia-voters-less-democratic-than-supporters-of-other-italian-parties/

# FRI-2B.313L

## FRI-2B.313-1-L-01

# THE REMUNERATION OF THE PEOPLE'S REPRESENTATIVES IN THE PRINCIPALITY/KINGDOM OF BULGARIA (1879 – 1944)

**Prof. Nikolay Prodanov, Ds** Faculty of Law University of Ruse "Angel Kanchev" E-mail: n\_prodanov@abv.bg

*Abstract:* The article examines the issue of the evolution of the various payments owed to the deputies in the Bulgarian parliament in the period from the beginning of the formation of the new Bulgarian statehood to 1944. *Keywords:* constitutional right; parliamentarism, history of Bulgarian law.

# THE RIGHT OF LABOUR IN THE CONTEXT OF ECONOMIC RIGHTS

## Assoc. Prof. Elitsa Kumanova, PhD

Department of Public Law, Law Faculty University of Ruse "Angel Kanchev" E-mail: ekumanova@uni-ruse.bg

Galena Stefanova - PhD student Department of Public Law, Law Faculty University of Ruse "Angel Kanchev" E-mail: gstefanova@uni-ruse.bg;

Abstract: Economic rights include the right to work, to an adequate standard of living, to shelter, as well as the right to a pension if one reaches a certain age or is disabled. Economic rights reflect the fact that human dignity requires a certain minimum level of material security. One of the most important economic rights is the right to work for every person. Labour is exercised through human ability called labour power. Labour force or ability to work is the sum of physical and mental abilities available to an individual. But it is not labour power per se, but its application that matters for labour law.

*Keywords: Economic rights, right of labour, labour power JEL Codes: J20, J60,J80* 

# THE MEASURE OF LAW AS THE FOCUS OF LEGAL VALUES

#### 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 measure is a substance of Law. It provides the sharing energy of law. It is a volume concept of The Philosophy of Law and legitimate the sense and the content of law. It contains justice, equity, proportionality, liberty, synallagmaticity in realizing of public relations.

**Keywords:** Measure of law, Philosophy of law, General theory of law, law sense, justice, equity, liberty, proportionality, synallagmaticity.

# ABOUT THE DIFFERENCE IN THE NOTIONS – "FACT FROM REALITY", "NORMATIVE FACT" AND "LEGAL FACT"

#### Asst. Prof., Doroteya M. Dimova-Severinova, PhD

Department of Public Law, Faculty of Law University of Ruse, Bulgaria Tel.: 00359888795885 E-mail: ddimova@uni-ruse.bg

#### Asst. Prof. Ganka Ivanova, PhD

Department of Psychology, Faculty of Education, Social Sciences and Humanities, Al Ain University, Abu Dhabi Campus, Abu Dhabi, UAE Phone: 00971505047082 E-mail: ganka.ivanova@aau.ac.ae

**Abstract:** There is a controversy in the legal theory regarding the notion of "fact". Essential to its understanding is the distinction between the notions of "normative fact", fact of reality" and "legal fact. The current mixing of the mentioned concepts leads to difficulties in the understanding of fundamental theoretical notions. Legal practice, for its part, uses the terms permanently and relatively without contradictions.

The present report has two purposes: to analyze the substantive characteristics of three two types of notions and to bring out the essential features of the fact from the reality, the normative fact and the legal fact.

*Keywords:* fact from reality, normative fact, legal fact, understandings, perceptions *JEL Codes:* 

#### REFERENCES

Boichev, G. 2009. The legal institutionalism. Methodology of jurisprudence. Sofia: University publishing house "St. Kliment Ohridski" (**Оригинално заглавие:** Бойчев, Г. 2009. Правният институционализъм. Методология на юриспруденцията, София, Унивеситетско издателство "Св. Климент Охридски ).

Ganev, V., 1990. General theory of Law. Part I, Sofia, University publishing house "St. Kliment Ohridski" (**Оригинално заглавие:** Ганев, В. 1990. Обща теория на правото. Част I, София, Унивеситетско издателство "Св. Климент Охридски ).

Dachev, L. 2019. Course of lectures on General theory of Law. Sofia (**Оригинално** заглавие: Дачев, Л. 2019. Курс лекции по Обща теория на правото. София).

Kolev, T. 2015. Law Theory. Sofia, University publishing house "St. Kliment Ohridski" (**Оригинално заглавие**: Колев, Т. 2015. Теория на правото. София, Унивеситетско издателство "Св. Климент Охридски")

Mather, L.2011. Law and society, The Oxford handbook of political science, Oxford University Press, Oxford, 2-15

Міhailova, М. 2002. Theory of law. Sofia, Feneya publishers (**Оригинално заглавие**: Михайлова, М. 2002. Теория на правото. София, Издателство "Фенея").

Tarman, B. 2017. Editorial: The Future of Social Sciences. Research In Social Sciences And Technology, https://ssrn.com/abstract=3053352

Radev, D.2020. Legal reality and legal order. Sofia, Vusy publishers (**Оригинално** заглавие: *Радев, Д. 2020. Правна действителност и правен ред. София, Издателство* ,,*Bycu*<sup>(\*)</sup>.

Sunstein, Cass R., 1996, Social Norms and Social Roles, Columbia Law Review 96: 903-68

Shopov, A. 2011. The notion of "Legal fact". Sofia, Paper presented at the Conference "Prof. M.Andreev's 100th years of Birthday" Sofia (*Оригинално заглавие:* Шопов, А., 2011. Понятие за юридически факт. Научен доклад, представен на конференцията "100 години от рождението на проф. М. Андреев" София)

Tashev, R. 2007. General legal theory.Sofia: Sibi (*Оригинално заглавие: Ташев, P., 2007.* Обща теория на правото. София: Издателство "Сиби")

# STUDIES ON THE LEGITIMATION OF THE STATE

## Asst. Prof. Ivelin Velchev, Faculty of Law, Public Law "Angel Kanchev" Univesity of Ruse Tel.: 0889 261 356 E-mail: ivelchev@uni-ruse.bg

**Abstract:** a group of teachings that investigate and presents the grounds that legitimize the state. They have as their subject the meaning of existence of the state, deriving its mission and role. These studies are oriented towards social values, as legitimizing foundations. In this regard, the justification of the state is the derivation of its mission related to the preservation of the social community.

Keywords: State, Mission, Social values, Legitimize

# THE DISCIPLINARY RESPONSIBILITY OF CIVIL SERVANTS IN THE PRINCIPALITY OF BULGARIA

#### Miroslava Bodurova – Eneva, PhD

Faculty of Law, "St. Cyril and St Methodius"University of Veliko Tarnovo

**Abstract:** The article analyzes the regulations regarding the disciplinary responsibility of civil servants in the Principality of Bulgaria (1879 - 1906). Within the mentioned period, three successive laws for civil service officials functioned.

Keywords: civil service, disciplinary liability, Principality of Bulgaria.

# ON THE PRIVILEGE OF THE FIRST RANKED CANDIDATES IN THE LISTS FOR PARLIAMENTARY ELECTIONS

#### 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:** The paper discusses on an actual issue – the preferential voting in parliamentary elections in Bulgaria and especially the privilege of the leaders in the lists of candidates to receive all non-preferential votes for themselves. The author makes a short review of the development of preferential voting in the contemporary Bulgarian legislation and states her opinion on the matter.

*Keywords:* elections, National Assembly, preferential voting *JEL Codes:* D 72, K16

# SCHENGEN LAW AND THE AREA OF FREEDOM, SECURITY AND JUSTICE IN THE EUROPEAN UNION

Assoc. Prof. Emanuil Kolarov, Dr.iur., Mag.Eur.St. Department of Public Law Angel Kanchev University of Ruse, Bulgaria Tel.: +359 82 888 434 E-mail: ekolarov@uni-ruse.bg

Abstract: The Maastricht Treaty (signed on February 7th, 1992) provides that the Member States are resolved to facilitate freedom for movement of persons while providing higher level of security and safety for their people. This is a step further for opening common borders between the states and, thus, establishing the internal market as an area without frontiers where freedoms for movement for persons, goods, services and capital is ensured. First attempts were made in 1984 by signing the Saarbruecken Agreement between France and West Germany for gradual abolition of border checks on the common Franco-German border, and – above all – Schengen Agreement from 1985 between France, West Germany, and BeNeLux on the gradual abolition of checks at their common borders. The efforts toward more freedom in cross-border movement are related to necessary measure to safeguard public order and public security. This is why the above mentioned agreements provide cooperation between competent authorities in the fields of visa and immigration policy, and combat of transfrontier criminality. So, all further acts to these goals are later called "Schengen acquis", and they establish the Schengen area as a symbol of free movement in crossing common borders and compensatory control on external borders, as well as approximated national policies in certain fields – e.g. visa, asylum. to the beginning of 2000s the accession of majority of EU Member States to these legal acts is a fact.

The Amsterdam Treaty (from 1997) integrates these achievements into the European Community competences and makes significant reform to the third EU pillar. Visa, asylum and immigration policies are moved to the first pillar (integration) and within the third pillar remain police and judicial cooperation in criminal matters. Till the time of entry into force of this threaty most of the old Member States of the Union have been accessed to the Schengen agreement and the Convention for its application.

Finally, the Threaty of Lisbon revokes the three pillar system of the EU and proclaimes the area of freedom, security and justice as an integral part of the Union's policies defined and developed via rules of the Treaty for the functioning of the Union – Art. 67-89. The area is now based on the policies of free movement of persons (where lack of internal border control is provided to the citizens), immigration and visa and asylum (oriented to third countries nationals) and police and judicial cooperation in criminal matters (with the aim to combat criminality that affects the interests of more countries), and civil justice cooperation (where access to justice and mutual recognition of judicial acts on civil matters is provided).

Keywords: European integration, European Community, Area of Freedom, Security and Justice, Schengen Agreement, Maastricht Treaty, Amsterdam Treaty, Lisbon Treaty, external border control, internal marker, freedom for movement of persons, immigration, asylum, police and judicial cooperation in criminal matters, judicial cooperation in civil matters, Frontex, Europol, Eurojust, European Prisecutor's Office, Eurodac, Schengen Information System JEL Codes: L10, L11

#### **REFERENCES**

Craig, P., Gr. de Búrca (2003, 2006, 2011). EU Law. Text, Cases and Materials. Oxford University Press.

Chalmers, D., Chr. Hadjiemmanuil, G. Monti, A. Tomkins (2006). *European Union Law. Text and Materials*. Cambridge University Press.

Oppermann, Th. (2011). *Europarecht*. Ein Studienbuch. Juristische Kurz-Lehrbuecher, C.H.Beck.

Streinz, R. (2008). *Europarecht*. Mit Lissaboner Reformsvertrag. C.F.Mueller. Heidelberg.

Consolidated versions of the Treaty for the European Union and the Treaty for the Functioning of the European Union, Official Journal of the European Union, C 202, 7.6.2016.

Schengen Agreement and Convention implementing the Schengen Agreement, Official Journal of the European Communities, L 239, 22.9.2000.

# THE AGREEMENT IN ADMINISTRATIVE SANCTION PROCEDURE

#### Chief Assist. Dilyana Kalinova, PhD

Departament of Public Law, Law Faculty "Angel Kanchev" University of Ruse E-mail: dkivanova@uni-ruse.bg

**Abstract:** The administrative violation is an offence of the established order of the state government. It is a public act of danger. Because of that it is necessary to engage the administrative responsibility of the violator. This is achieved by imposing an administrative sanction. The administrative sanctions are imposed by competent bodies. a new condition in administrative sanction procedure is the agreement between the competent body realizing administrative sanctions and the violator. The aim of agreement is to conclude the administrative sanction procedure more quickly.

**Keywords:** Administrative violation, Administrative sanction, Procedural Law on Administrative Sanction, Agreement, Administrative liability

#### REFERENCES

Administrative Violations and Sanctions Act, Official Gazette, copy 92/28.11.1969 g.; last changes Official Gazette, copy 51/ 1.07.2022 g. (*Оригинално заглавие:* Закон за административните нарушения и наказания, обн. ДВ, бр. 92/28.11.1969 г., посл. изм. ДВ, бр. 51/ 1.07.2022 г.)

Ilkova, R., P. Tyankova, 2021. The New Conditions in Administrative Punishment, Sofia: Siela Norma (*Оригинално заглавие:* Илкова, Р., П. Тянкова, 2021. Новите положения в административното наказване. София: Сиела Норма)

Kostov, D., D. Hrusanov, 2011. Administrative Procedures of Republic of Bulgaria, Sofia: Sibi, (*Оригинално заглавие: Костов Д., Д. Хрусанов, 2011. Административен процес на РБ., София: Сиби.)* 

Lazarov, K., Iv. Todorov, 2020. Administrative Procedure, Sofia: Siela Norma (*Оригинално* заглавие: Лазаров, К., Ив. Тодоров, 2020. Административен процес. София: Сиела Норма).

# PRECLUDING EFFECT OF THE FORCE OF RES JUDICATA, ARISING FROM THE COURT DECISION ON CHALLENGING AGAINST AN ADMINISTRATIVE ACT

#### Valeri Radanov

Administrative Court of Silistra E-mail: valeri.radanov@gmail.com

*Abstract:* The paper examines the precluding effect of the force of res judicata, arising from the court decision on challenging an administrative act, in perspective of its addressees and subject matter. *Keywords:* Precluding Effect, Res Judicata, Administrative Procedure.

• • • • • • •

#### REFERENCES

Козtov, М., 1975. On the legal essence of the administration's refusals and on their control. – Legal Thought, No. 6 (**Оригинално заглавие:** Костов, М., 1975. За правната същност на отказите на администрацията и за контрола върху тях. – Правна мисъл,  $N_{2}$  6).

Lazarov, K., I. Todorov, 2009. Administrative process. Sofia: Siela Publishing House (**Оригинално заглавие:** Лазаров, К., И. Тодоров, 2009. Административен процес. София: Издателство "Сиела").

Репсhev, К., I. Todorov, G. Angelov, B. Yordanov, 2006. Administrative procedural code. Commentary. Sofia: Siela Publishing House (**Оригинално заглавие:** Пенчев, К., И. Тодоров, Г. Ангелов, Б. Йорданов, 2006. Административнопроцесуален кодекс. Коментар. София: Издателство "Сиела").

Radanov, V., 2011. Again about silent administrative acts. – Contemporary Law, No. 4 (**Оригинално заглавие:** Раданов, В., 2011. Отново за мълчаливите административни актове. – Съвременно право, № 4).

Radanov, V., 2013. Content of the res judicata of the decision on challenging an administrative act. – In: Development of law in a globalizing world. Jubilee collection. Sofia: Feneya Press (Оригинално заглавие: Раданов, В., 2013. Съдържание на силата на пресъдено нещо на решението по оспорване на административен акт. – В: Развитие на правото в глобализиращия се свят. Юбилеен сборник. София: Издателство "Фенея").

Silyanovski, D., Zh. Stalev, 1958. Civil process. Volume I. Sofia: Science and Art Publishing House (**Оригинално заглавие:** Силяновски, Д., Ж. Сталев, 1958. Граждански процес. Том I. София: Издателство "Наука и изкуство").

Stainov, P., 1993. Administrative justice. Phototype edition. Sofia: Publishing House of the Bulgarian Academy of Sciences (*Оригинално заглавие: Стайнов, П., 1993. Административно правосъдие. Фототипно издание. София: Издателство на Българската академия на науките*).

Stalev, Zh., 2007. Force of res judicata in the civil process. Sofia: Siela Publishing House (**Оригинално заглавие:** Сталев, Ж., 2007. Сила на пресъдено нещо в гражданския процес. София: Издателство "Сиела").

Yanovski, B., 1975. The preclusive effect of res judicata and the facts were unknown to the objecting party. – Socialist Law, No. 7 (**Оригинално заглавие:** Яновски, Б., 1975. Преклудиращото действие на силата на пресъдено нещо и фактите били неизвестни на възразяващата страна. – Социалистическо право,  $N_2$  7).

Zinovieva, D., 2009. Discussion theses in administrative law and process. Sofia: Siela Publishing House (**Оригинално заглавие:** Зиновиева, Д., 2009. Дискусионни тези в административното право и процес. София: Издателство "Сиела").

# TAX SOVEREIGNTY AND GLOBALIZATION

#### Ass. prof. Elina Marinova, PhD

Public law Department, Faculty of Law "Angel Kanchev" University of Ruse E-mail: elina\_marinova@uni-ruse.bg

**Abstract:** The paper outlines the changes in the mechanism of exercise of tax sovereignty as a result of economic, political globalization and digitalization. New economic and political realities require new concepts of the nature, limits and dimensions of tax sovereignty. Global interdependence increasingly requires mutual synchronization of national legal orders. The lack of coherence between national taxation systems often leads to a state of deregulation with respect to potential tax objects and the use of this situation for tax avoidance by companies. In the global world the approach of coordination by the assessment and collection of taxes increasingly prevails over that of subordination.

Keywords: tax, sovereignty, globalization, digitalization, decentralization, coordination, cooperation

# THE CONCEPTS OF TAX SOVEREIGNTY AND TAX JURISDICTION IN INTERNATIONAL TAX LAW

Ass. prof. Elina Marinova, PhD Public law Department, Faculty of Law "Angel Kanchev" University of Ruse E-mail: elina\_marinova@uni-ruse.bg

**Abstract:** The paper examines and compares the concepts of tax sovereignty and tax jurisdiction, which are fundamental in international tax law. These concepts are inextricably linked and quite often considered as interchangeable, but closer examination reveals their specificities. It is concluded that tax sovereignty expresses the supreme, principle authority of the state to assess and collect taxes on its own territory, and tax jurusdiction – a legal form of practical realization of the state's powers in the field of taxation within a fiscal territory.

Keywords: sovereignty, jurisdiction, power to tax, legal order, fiscal territory, international tax law

# COMPETENCE OF THE MUNICIPAL ADMINISTRATION OFFICERS REGARDING THE ASSESSMENT, SECURING AND COLLECTION OF LOCAL TAXES

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: According to Art. 4 of the Local Taxes and Fees Act, Local taxes shall be assessed, secured and collected by municipal administration officers according to the procedure established by the Tax and Social-Insurance Procedure Code. The related acts shall be appealed according to the location of the municipality in whose area the obligation has arisen in accordance with the procedure laid down in the Tax and Social Insurance Procedure Code. In these proceedings, municipal administration officers, determined by order of the mayor, have the rights and obligations of revenue authorities, and in the proceedings for the securing of tax obligations - of public enforcement agents. This is not the case with their competence in proceedings for coercive collection of local taxes. It is carried out by public enforcement agents in accordance with the Tax and Social-Insurance Procedure Code or by judicial enforcement agent in accordance with the Tax and Social-Insurance Procedure Code or by judicial enforcement agent agent in accordance with the Tax and Social-Insurance Procedure Code or by judicial enforcement agent agent in accordance with the Tax and Social-Insurance Procedure Code or by judicial enforcement agent agent in accordance with the Tax and Social-Insurance Procedure Code or by judicial enforcement agent agent in accordance with the Tax and Social-Insurance Procedure Code or by judicial enforcement agent in accordance with the Tax and Social-Insurance Procedure Code or by indicial enforcement agent in accordance with Code of civil Procedure. The subject of this report is to reveal the specifics of the procedure for assessement, securing and collecting local taxes on the one hand, and the enforcement procedure on the other.

*Keywords: local taxes, competence, enforcement procedure JEL Codes:* H 71,K 34

#### REFERENCES

Penov, S. (2021). Financial Law- Genearal Part. Sofia: University press "St. Kliment Ohridski" (**Оригинално заглавие:** Пенов, С, 2021. Финансово право- Обща част. София: Университетско издателство "Св. Климент Охридски".)

Engelen, F. Interpretation of Tax treaties under International Law (2004 IBFD), chapter 10.

Simon James and Alison Edwards, 'Developing Tax Policy in a Complex and Changing World' (2008) 38(1) Economic Analysis and Policy, 35.

# SIMILARITIES AND DIFFERENCES BETWEEN THE CIVIL PLEDGE UNDER THE OBLIGATIONS AND CONTRACTS ACT AND THE COMMERCIAL PLEDGE UNDER THE COMMERCE ACT

**Prof. Georgi Stefanov, ScD** Department of Law, University of Ruse "Angel Kanchev" E-mail: gstefanov@uni-ruse.bg

Kiril Veselinov – PhD Student Department of Law, University of Ruse "Angel Kanchev" Tel.: +359 892376420 E-mail: kveselinov@uni-ruse.bg

*Abstract:* The paper reviews the similarities and differences between the civil pledge and the commercial pledge. Despite their close connection, there are significant distinctions between them. In order to be well distinguished, it is necessary to make a comparison. The characteristic of both pledges require in-depth review and attention to detail. *Keywords:* Civil pledge, obligations and contracts act, commercial pledge, commerce act

#### REFERENCES

Gerdzhikov, O., Kasabova, K., Markov, M., Ruschev, I., Stefanov, G., Goleva, P., Gradinarova T., Gigova, V., Nedkova, K., 2018. Collateral in substantive and procedural law. Labour and Law press (*Оригинално заглавие:* Герджиков О., Касабова К., Марков М., Русчев И., Стефанов Г., Голева П., Градинарова Т., Гигова В., Недкова К., 2018. Обезпеченията в материалното и в процесуалното право. Издателство "Труд и право".)

Gerdzhikov, O., 2015. Commercial deals. Laubor and law press (*Оригинално заглавие:* Герджиков, О., 2015. Търговски сделки. Издателство "Труд и право".)

Kozhuharov, A., 2002. Contract law. JURISPRESS press (*Оригинално заглавие:* Кожухаров, А., 2002. Облигационно право. Издателство "ЮРИСПРЕС".)

Vladimirov, I., 2011. Commercial law. Romina press (*Оригинално заглавие: Владимиров, И., 2011. Търговско право. Издателство "Ромина".*)
# ENTERPRISES OF SOCIAL AND SOLIDAR ECONOMICS - LEGAL SYSTEM AND NATURE

#### Assistant professor Anastas Georgiev, PhD Department of Civil Law, Law Faculty, "Angel Kanchev" Univesity of Ruse Phone: +35982888746 E-mail: ageorgiev@uni-ruse.bg

**Abstract:** The strategic goal of the Law on Enterprises of Social and Solidarity Economics, pron. SG. No. 91 of November 2, 2018, amended SG. No. 17 of February 26, 2019, amended and add. SG. No. 24 of March 22, 2019, add. SG. No. 17 of February 25, 2020, is the differentiation, development and development of an economic branch which is predominantly socially oriented and whose main purpose is to generate a positive social added value in the direction employment, standard of living and social inclusion of vulnerable population groups.

The law aims to create the legal framework for the development of the social and solidarity economy as an economic sector with special rules with a view to improving the access to employment and training for acquisition or improvement of professional qualification in order to raise the standard of living of people of vulnerable groups, creating conditions for supporting people from vulnerable groups for social inclusion and independent living, reducing social inequality and sustainable territorial development.

The law creates opportunities for cooperation and closer cooperation between social enterprises themselves, between social enterprises and other interested parties, such as municipalities, the state, investors, citizens, etc.

Enterprises in the social and solidarity economy operate differently from traditional forms of doing business and economic unification. The major difference is that this form of entrepreneurship uses innovative approaches to achieve certain social goals as a result of its activity. The main characteristic of social enterprises is that they attach social importance to their economic goals - especially in the selection of staff and the distribution of positive financial results. In so doing, they combine public contribution and economic initiative.

Keywords: Social goals, Enterprises, Enterprises of Social and Solidarity Economics

#### REFERENCES

Petkov, Pl., Participation of members, employees in management as a principle of social and solidarity economy. Proceedings of University of Ruse - 2020, MSc and PhD Students & Young Scientists, volume 60, book 7.3, p.p.51-55, ISBN 1311-3321, https://conf.uni-ruse.bg/bg/docs/sns/2021/UF.pdf (*Оригинално заглавие:* Петков, Пл., 2020. Участие на членовете и служителите в управлението като принцип на социална и солидарна икономика, Сборник на Русенски университет - 2020, Студенти, докторанти и млади учени, том 60, книга 7.3, cmp.51-55. ISBN 1311-332 https://conf.uni-ruse.bg/bg/docs/sns/2021/UF.pdf ).

# ARREST OF SHIPS IN THE RIVER PORTS OF THE REPUBLIC OF BULGARIA

Assoc. Prof. Petar Bonchovski, PhD Faculty of Law Department of Private Law University of Ruse "Angel Kanchev" E-mail: pbonchovski@uni-ruse.bg

**Abstract:** The purpose of the report is to analyze some peculiarities and difficulties in the implementation of the regime of the International Convention for the Arrest of Ships from 1999, which regulates the arrest of ships in maritime claims, but also applies to river transport on the Danube. Criticism of the choice of this regime by the legislator and a proposal for changes are made..

Keywords: arrest of ship, maritime claims JEL Codes: H 71,K 34

FRI-2B.313-2-L-01

# ABOUT THE ENTRY OF THE AUTHORISED OFFICER IN THE COMMERCIAL REGISTER

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 authorised officer is the representative with the widest representative authority of all commercial representatives, whose regulations are contained in Chapter Six of the Commercial Law. They are indisputable in theory and practice the advantages of authorisation (power of attorney), both with a view to protecting the interests of the trader and third parties. There is no unanimity neither in the legal literature nor in practice regarding the effect of the entry and deletion of the authorised officer from the commercial register. In this report, through an in-depth analysis of the various opinions in the doctrine and a review of the judicial practice, it is clarified what are the prerequisites for the entry (respectively for the deletion) of the authorised officer in the register, what legal consequences it generates

Keywords: authorised officer; entry, deletion from commercial register.

# IMPOSSIBILITY OF THE HOLDER YOUR OWN YES ALL DEFEND WITH A CLAIM UNDER ART. 75 FROM THE LAW FOR PROPERTY

**Principal assistant professor, Sergey Kalinkov, PhD** Department of Civil Law, Law Faculty "Angel Kanchev" University of Ruse, E-mail: skalinkov@uni-ruse.bg

**Abstract:** Ownership claims regulated in art. 75 and Art. 76 of the current Law on Property, are intended to ensure the protection of dominion over movable or immovable property. It is irrelevant whether the person exercising the actual power is the owner or holder of the limited real right. In the current report, the emphasis is placed on the exclusion of holders from the group of claimants when filing a claim for violation of possession (Article 75 of the Law on Property). On the basis of the theoretical views, a comparative legal study of some foreign legislations concerning ownership protection, the weaknesses of the current legal system under Art. 75 of the Law on Property.

Keywords: protection, possession, holding, claim, legal order;

#### REFERENCES

1. Boyanov, G., Property law, S., 2014; (**Оригинално заглавие:** Боянов, Г., Вещно право, С., 2014);

2. Vasilev. L., Bulgarian property law, S., 1995; (Оригинално заглавие: Василев, Л., Българско вещно право, С., 1995);

3. Venedikov, P., New property law, S., 1995; (Оригинално заглавие: Венедиков, П., Ново вещно право, С., 1995);

4. Tadjer, V., Possessio, S., 1991; (Оригинално заглавие: Таджер, В., Владение, С., 1991);

5. Tasev, S., About ownership claims, Sp. SP, vol. 12/1971; (**Оригинално заглавие:** Тасев, С., За владелческите искове, Сп. СП, кн. 12/1971);

6. Kozhuharov, A, Obligation law, Separate types of bond relations, S., 2002; (**Оригинално заглавие:** Облигационно право, Отделни видове облигационни отношения, C., 2002);

7. Yehring, R., Grounds for the Defense of Possession, translation from German, M. 1883; (Оригинално заглавие: Йеринг, Р., Об основании защиты владения, перевод с немецкого, M., 1883);

# EFFICIENCY AND EFFECTIVENESS OF APPLICATION OF SPECIAL SEISMIC PROTECTION METHODS

## Assist. Prof. Yoana Kaneva, PhD

Department of Civil Law, Law Faculty, "Angel Kanchev" Univesity of Ruse E-mail: ykaneva@uni-ruse.bg

#### Abstract:

Keywords: Efficiency, Effectiveness, GPS, Seismic Protection Methods, Model JEL Codes: L10, L11

## REFERENCES

Goleva, P., Stoychev, Kr. Non - profit legal entities. Civil law regime. Sofia, 2018. Bulgarian Center for Non-Profit Law Publishing House. (*Оригинално заглавие:* Голева, П., Стойчев, Кр. Юридически лица с нестопанска цел. Гражданскоправен режим. София, 2018. Български център за нестопанско право).

# THE SPECIAL KIND OF DIVISION

#### As. Bilyana Ivanova

Private Law Department, "Angel Kanchev" University of Ruse, Bulgaria Tel.: +359896823683 E-mail: bkirova@uni-ruse.bg

**Abstract:** The present study examines the division of inheritance carried out by the testator during his lifetime. a historical overview of the institute has been made. The main moments in carrying out this special type of division under the current Bulgarian legislation in its two forms - division of a will and division of a donation - have been examined. The application of the institute in practice is not widespread so far, which is one of the reasons for developing the present work. The article aims, in addition to contributing to the scientific community, to sprak interest and familiarize the reader with the possibilities that art. 77 et seq. of the Inheritance Act provides in order to avoid future disputes between the heirs in the event of the death of their common ancestor.

**Keywords:** Inheritance, Heritage, Will, During lifetime, Bequest, Donation, Division, Partition, Property, Property Division.

#### REFERENCES

Tasev, Hr., 2020. Bulgarian inheritance law. Sofia: Nova zvezda press (*Оригинално* заглавие: Тасев, Хр., 2020. Българско наследствено право. София: Издателсво "Нова звезда).

Tasev, S., 2016. Division of co-ownership. Sofia: Nova zvezda press (*Оригинално заглавие: Тасев, С., 2016. Делба на съсобственост. София: Издателство "Нова звезда".)* 

Yochev, Evg., 2006. History of the Legislation of Principality of Bulgaria. Ruse:"Angel Kanchev" University of Ruse press. (*Оригинално заглавие:* Йочев, Евг., 2006. История на законодателството на Княжество България, Русе: Издателство - Печатна база при РУ "Ангел Кънчев".)

Таsheva, Sv., 1995. Bulgarian Inheritance Laws. 1890 – 1995. Sofia: Sibi press (**Оригинално** заглавие: Ташева, Св., 1995. Български закони за наследството. 1890 – 1995. София: Издателство "Сиби".)

# ABILITY TO CHALLENGE PATERNITY UNDER THE AMENDMENT OF THE BULGAIRAN FAMILY CODE OF 2020 - OCCASIONS AND RATIO LEGIS FOR THE CHANGE AND COMPARISON WITH THE LEGAL REGIME IN OTHER EU MEMBERS

#### **Part-time assist. Hristo Angelov**

Faculty of Law, "St. Cyril and St Methodius"University of Veliko Tarnovo, Phone: +359 878 389 453 E-mail: h.angelov@ts.uni-vt.bg

Abstract: The mother is always known. a father is the one whom marriage points to. This is how the ancient Romans defined the principles on which the system of filiation was based. In order to discuss paternity disputes in comparative law, the methods for establishing paternity and the related mechanisms for challenging paternity according to Bulgarian family law should be defined: 1. the above-mentioned Roman principle is enshrined legislatively in Art. 61 of Bulgarian Family Code "The mother's husband is considered the father of the child born during the marriage or before the expiration of three hundred days from its termination."; 2. the recognition under Art. 64-65 of Bulgarian Family Code is also part of the legislative revision of 2020 - the recognition can be contested by any person who claims to be the parent of the person recognized, through a claim filed within one year from the knowledge of the recognition; 3. the third way to establish paternity - successful prosecution under Art. 69 of Bulgarian Family Code by the mother or the child. The actual "disputing" of paternity in this case should be carried out within the framework of the court proceedings through objections, appeals, annulment of an effective decision. The subject of this comparative legal study is the regulation in the EU member states is challenging the presumption of paternity and contesting recognition.

*Keywords:* challenging, Comparative Law, European Union, Family Law, paternity. *JEL Codes:* K15, K36

#### REFERENCES

Andreev, M. (1999). Roman Civil Law. Sofia: Sofi-R, 180. **Оригинално заглавие:** Андреев. М, 2008. Римско частно право. София: Издателство "Софи-Р".)

Apetrei. Ir. Paternity in the legislative vision of the new Romanian Civil Code, достъпна на интернет адрес https://www.umk.ro/images/documente/publicatii/Buletin20/paternity.pdf

A study of legal parentage and the issues arising from international surrogacy arrangements, Preliminary Document No 3 C of March 2014 for the attention of the Council of April 2014 on General Affairs and Policy of the Conference https://assets.hcch.net/docs/bb90cfd2-a66a-4fe4a05b-55f33b009cfc.pdf

Briand, S. Delarbre, C., Krygiel. A. Filiation, genetics and the judge: conciliating family stability and the right to biological truth.

https://www.ejtn.eu/PageFiles/14775/Written%20paper\_France.pdf

Browne-Barbour, V. *Mama's baby, papa's maybe'': disestablishment of paternity.* https://www.uakron.edu/law/lawreview/volumes/v48/issue2/3%20-%20Browne%20Barbour%20-%20p263%20-%20FINAL%20NO%20HEADER.pdf

Mateeva, E. (2010) Family Law in Republic of Bulgaria. Varna: Varna Free University Press "Chernorizec Hrabar", 354. (Оригинално заглавие: Матеева, Е. 2010 Семейно право на Република България. ВСУ "Черноризец Храбър", 354.)

Neshataeva, T. European convention on human rights – integration of integration: the way to overcome the fragmentation of International Law (**Оригинално заглавие:** Нешатаева. Т. Европейская конвенция по правам человека и интеграция интеграций: пути преодоления фрагментации международного права.)

Vrahimi, E. (2018) *Family Law in Cyprus*. достъпна на https://www.vrahimi.com/law-guide/2018/4/25/family-law-in-cyprus

# INVALID, ANNULED AND DESTROYABLE MARRIAGE

#### Milena Dimova – PhD Student

Private Law Department, Faculty of Law, University of Ruse "Angel Kanchev" Tel.: +359 888919700 E-mail: mdimova@uni-ruse.bg

**Abstract:** The paper reviews a short historical review of Bulgarian legislation of Family Law after the Liberation of Bulgaria to our days. It describes three different variations of violation of marriage rules and their consequences for marriage - annulment of marriage, nullity of marriage and regular marriage with the disciplinary liability of the officer of a town hall. The paper in short review defines a plaintiff in each case, who can lay a claim in front of a judge court and individual period for each hypothesis of nullity of marriage. In conclusion, is made a review of already made changes of legislation and it is supplied opinion for norm making of the important social phenomenon, which must be set to today's society.

Keywords: marriage, annulment of marriage, nullity of marriage

## REFERENCES

Kiranov, Pr., Genovski, M. (1928). Marriage and Divorce under the Exarchial Statute. Sofia: "Saglasie". (*Оригинално заглавие:* Киранов, Пр., Геновски, М. (1928). Брак и бракоразвод по Екзархийския устав. София: "Съгласие").

Markov, M., (2009). Family Law. Sofia: "Sofi-R". (*Оригинално заглавие:* Марков, М., (2009). Семейно право. София: "Софи-Р").

Маteeeva, Е. (2010). Family Law of Republic Bulgaria. Varna: "IK Chernorizetz Hrabar". (*Оригинално заглавие:* Матеева, Е. (2010). Семейно право на Република България. Варна: "ИК Черноризец Храбър".)

Tsankova, Ts. (2000). De facto conjugal cohabitation and Bulgarian family law. Sofia: "Fenea". (*Оригинално заглавие:* Цанкова, Ц. (2000). Фактическо съпружеско съжителство и българското семейно право. София: "Фенея".)

Punev, B. (2017). Code of Civil Procedure. Comment attached. Law enforcement issues. Analysis of judicial practice. Sofia: "IK Trud i pravo". (*Оригинално заглавие:* Пунев, Б. (2017). Граждански процесуален кодекс. Приложен коментар. Проблеми на правоприлагането. Анализ на съдебната практика. София: "ИК Труд и право".)

https://www.ciela.net/svobodna-zona-darjavenvestnik/document/2110661633/issue/3935/zakon-za-litsata

https://www.ciela.net/svobodna-zona-darjavenvestnik/document/2135480767/issue/3941/naredba-zakon-za-braka

https://www.grao.bg/normact/normativ-imena.html

# RESTRICTION OF PARENTAL RIGHTS AS A CONSEQUENCE OF THE IMPLEMENTATION OF EDUCATIONAL MEASURES UNDER ART. 13, PARA. 1, ITEM 11 AND ITEM 13 OF THE ZBPPMN

#### Denitsa Petrova, PhD Student

Private Law Department, Faculty of Law "Angel Kanchev" University of Ruse, Bulgaria Lawyer in the Ruse Bar Association E-mail: dpetrova@uni-ruse.bg

**Abstract:** It is the duty and right of parents to care for and educate children, to exercise supervision and subsequent appropriate control of their behavior, so that adolescents can socialize as full members of society. Sometimes, due to various reasons, the parental functions are not performed and in these cases it is necessary, in order to protect the interests of the child and those of society, for the state to support the parental rights are limited, and this can be seen as both a help and a sanction for parents who do not know how to take adequate care of their children.

Keywords: restriction of parental rights, educational measures, parental capacity

## REFERENCES

Bulgarian Helsinki Committee, 2014. Report entitled: Children Deprived of Liberty: Between Legacy and Reform, Sofia (*Оригинално заглавие:* Български хелзинкски комитет, 2014. Доклад със заглавие: Деца, лишени от свобода: между наследството и реформата, София)

Ivanova, E., 2000. The family, condition and factor for children's deviations, Public Education, no. 4, pp. 11-14 (*Оригинално заглавие:* Иванова, Е., 2000. Семейството, условие и фактор за детските девиации, Обществено възпитание, бр. 4, стр. 11-14)

Мапаsieva, Т., 2002. On the meaning of placement in VUI, Public Education, no. 6, pp. 53-60 (**Оригинално заглавие**: Манасиева, Т., 2002. За смисъла на настаняването във ВУИ, Обществено възпитание, бр.6, стр. 53-60)

Manasieva, T., 2007. Parental attitude towards children's deviations, Journal of Public Education, no. 3, pp. 23-24 (*Оригинално заглавие:* Манасиева, Т., 2007. Родителското отношение към девиациите на децата, сп. Обществено възпитание., бр. 3, стр. 23-24)

Margaritova, Sv., 2011. Educational measures against minors, Society and law, no. 3, pp. 32-58 (**Оригинално заглавие:** Маргаритова, Св., 2011, Възпитателни мерки срещу малолетни и непълнолетни, Общество и право, бр. 3, стр. 32-58)

Nenova, L., 2009. Family law - book two, Sofia, publishing house Sofi-R (*Оригинално* заглавие: Ненова, Л., 2009. Семейно право- книга втора, София, издателство Софи- P)

Stankov, B., 2008. Minors, juveniles, antisocial acts, crimes, responsibility. Varna: "Chernorizets Hrabar" VSU (*Оригинално заглавие*: Станков, Б., 2008. Малолетни, епълнолетни, противообществени прояви, престъпления, отговорност. Варна: ВСУ "Черноризец Храбър")

Zlatanova, V., 1996. Family and children's misdeeds, Public Education, no. 3, pp. 25-27 (**Оригинално заглавие:** Златанова, В., 1996. Семейството и провиненията на децата, Обществено възпитание, бр.3, стр. 25-27)

# CORRELATION BETWEEN GENERAL AND SPECIAL SUBROGATION CLAUSES UNDER THE BULGARIAN OBLIGATIONS AND CONTRACTS ACT

#### Ognyan Maladzhikov, PhD Student

Private Law Department, Faculty of Law "Angel Kanchev" University of Ruse, Bulgaria Regional judge at Tutrakan regional court E-mail: omaladzhikov@uni-ruse.bg

Abstract: The general subrogation clause in Bulgarian civil law is presented in Article 74 of the Obligations and Contracts Act. Its text is laconic: "A person who has performed another's obligation, having a legal interest to do so, shall assume the rights of the creditor". The same act includes some special subrogation hypotheses. The paper examines and criticizes the existing opinion in the legal doctrine that the prerequisites under the general subrogation clause are also presented in the special ones. The practical conclusion inevitably following from this belief is that the collateral providers who are not principal debtors can employ both the special subrogation provisions and the general clause to step into the place of the satisfied creditor. The present article explores the thesis that the general subrogation clause is not applicable in hypotheses regulated by the special norms, which means that its scope of application is more limited than the common belief.

Keywords: subrogation, performance, guarantor, collateral, creditor, obligation, co-debtor

#### REFERENCES

Genchev, T. (2017). About the Legal Interest in Respect to Subrogation. Papers of National Conference of Doctoral Students in Law 1:211-217 (**Original title:** Генчев, Т. (2017). "За правния интерес при суброгацията". Сборник с доклади от национална конференция на докторантите в олбастта на правните науки: 1:211-217)

Genchev, T. (2019). About Entering into the Rights of the Creditor. *Legal thought magazine*, vol. 4/2019 (*Original title:* Генчев, Т. (2017). За встъпването в правата на кредитора. Правна мисъл, кн. 4/2019)

Gerdzhikov, O., and others. (2018). Collateral in substantive and procedural law. Sofia: "Trud i Pravo" Press (*Original title:* Герджиков, O. и др., (2018). Обезпеченията в материалното и процесуалното право. София: ИК "Труд и право")

Goleva, P. (2015). Obligation Law. Sofia: "Nova Zvezda" Press (*Original title:* Голева, П. (2015). Облигационно право. София: Нова звезда)

Kalaydzhiev, A. (1989). About the Subrogation. State and Law magazine, vol. 5/1989 (Original title: Калайджиев, А. (1989). За суброгацията. Държава и право, кн. 5/1989)

Kalaydzhiev, A. (2010). Obligation Law. Sofia: "Sibi" Press (*Original title:* Калайджиев, A. (2010). Облигационно право. София: Сиби

Коглинатоv, Al. (1954). Obligation Law. Sofia: "Nauka I izkustbo" Press (**Original title:** Кожухаров, Ал. (1954). Облигационно право. София: Държавно издателство "Наука и изкуство")

Venedikov, P. (1938). Assumption of the rights of the satisfied creditor in Roman and Bulgarian civil law. – Yearbook of Sofia University, Vol 33(Original title: Венедиков, П.(1938). Встъпването в правата на удовлетворения кредитор в римското и българското гражданско право. –Годишник на Софийския университет. Том 33)

Ruschev, Iv. (2019). Boundary cases in law: Relationship between subrogation and recourse. In Gramada URL: http://gramada.org/гранични-случаи-в-правото-съотношени/ (Accessed on 11.06.2021) (*Original title: Русчев, Ив. (2019) Гранични случаи в правото:* съотношение *между суброгация и регрес. В сайта Грамада с* URL: http://gramada.org/гранични-случаи-в-правото-съотношени/ (Посетен на 11.06.2021)

Tashev, R. (2007). Theory of interpretation. Sofia: "Sibi" Press (Original title: Ташев, P. (2007). Теория на тълкуването. София: Сиби)

A Bill on Obligations and Contracts – archival unit in the Bulgarian Central State Archive (CSA): CSA-12, archival fund  $N_{\text{D}}$  117, inventory  $N_{\text{D}}$  9, archival unit  $N_{\text{D}}$  52 (Original title: Законопроект за задълженията и договорите – архивна единица на Централния държавен архив: ЦДА-12, фонд 117, опис 9, а.е. 52)

French Civil Code in English – after the 2016 reform – URL: https://www.translex.org/601101/\_/french-civil-code-2016/ (Accessed on 11.06.2021) (*Original title: реформираният Граждански кодекс на Франция на английски език* URL: https://www.translex.org/601101/\_/french-civil-code-2016/ (Посетен на 11.06.2021)

German Civil Code URL: https://www.gesetze-im-internet.de/englisch\_bgb/ (Accessed on 11.06.2021) (*Original title:* Граждански кодекс на Германия URL: https://www.gesetze-im-internet.de/englisch\_bgb/ (Посетен на 11.06.2021)

Obligations and Contracts Act (1951) – unofficial translation – URL: http://web.solicitorbulgaria.com/index.php/bulgarian-obligations-and-contracts-act (Accessed on 11.06.2021) (*Original title: Неофициален превод на Закона за задълженията и договорите* (1951) URL: http://web.solicitorbulgaria.com/index.php/bulgarian-obligations-and-contracts-act (Посетен на 11.06.2021)

# CONTROL POWERS OF THE SUPERVISORY BOARD IN THE TWO-TIER MANAGEMENT SYSTEM OF A JOINT-STOCK COMPANY

Ruja Andreeva – PhD Student Department of Private law, University of Ruse "Angel Kanchev" Tel.: +359 88 970 1463 E-mail: randreeva@uni-ruse.bg

**Abstract:** The report reveals how the supervisory board of a joint-stock company exercises its control powers. Emphasizes on the control powers of the supervisory board. The Bulgarian regulatory framework does not contain a basis for good and effective corporate governance. The interests of all stakeholders are not sufficiently protected, which is mainly due to the fact that the law does not contain a quality response to the problems it has to solve. The measures of control influence that the supervisory board exercises cannot be clearly separated from its management rights. The importance of control in recent times has grown considerably because the owners of capital have had to cede their powers of management to others. And since the owners remain so, it is only natural that control comes to the fore.

**Keywords:** Bulgarian law, Joint stock company, Management bodies, Distribution of functions, Commercial Law, Supervisory boards, Problems related to the management, Control powers.

#### REFERENCES

Kalaydzhiev, A. (2019), Joint Stock Company, S., Press: Sibi. (Оригинално заглавие: Калайджиев, А. (2019), Акционерно дружество, С., Издателство: Сиби).

Таdjer, V., O. Gerdjikov., G. Stefanov, K. Kasabova, T. Buzeva, T., (2011), Capital companies. Sofia, Publishing House: Labor and Law. (Оригинално заглавие: Таджер, В., О. Герджиков., Г. Стефанов, К. Касабова, Т. Бузева, Т., (2011), Капиталови търговски дружества. С., ИК. Труд и право.

Kolev, N. (2012), Organ Representation of the Joint Stock Company, Sofia, Press: Sibi. (Оригинално заглавие: Колев, Н. (2012), Органно представителство на акционерното дружество, С., Издателство: Сиби).

Stefanov, G. (2018), Commercial Company Law. Second updated edition, VT., Press: Abagar. (Оригинално заглавие: Стефанов, Г. (2018), Търговско дружествено право. Второ актуализирано издание, В.Т., Издателство: Абагар).

Stefanov, G. (2004), Issues of the management of the joint stock company, Magazine Commercial Law, issue 6 (Оригинално заглавие: Стефанов, Г. Въпроси на управлението на акционерното дружество, Сп. Търговско право. бр. 6/2004).

Stoychev, K. (1992), Capital Companies. Management and its legal regulations, Sofia: AI "Prof. Marin Drinov". (Оригинално заглавие: Стойчев, К. (1992), Търговски дружества на капитала. Мениджмънт и неговата правна регламентация, С.: АИ "Проф. Марин Дринов").

Hrusanov, D. (2012), Administrative Law of the Republic of Bulgaria. Common part. Sofia, Press: Sibi. (Оригинално заглавие: Хрусанов, Д. (2012). Административно право на РБ. Обща част. С: Издателство: Сиби)

# THE STRUCTURE AND QUALIFICATION OF EMPLOYEES AS A STANDARD FOR THE QUALITY OF SOCIAL SERVICE

Assist. Prof. Maria Radeva, PhD

Department of Private Law Science, Faculty of Law "Angel Kanchev" University of Ruse Phone: 0887 299 552 E-mail: mradeva@uni-ruse.bg

**Abstract:** Social services shall be activities aimed at supporting individuals in prevention and/or overcoming of social exclusion, exercising rights, improving the quality of life. Social services shall be financed by the state budget, the municipal budgets and private providers of social services. Social services shall be provided in accordance with an Ordinance on the Quality of Social Services. The quality standards for social services shall be standards for organisation and management of the service, qualification and professional development of the staff who carry out the activity of providing the service, the efficiency of the service in terms of the results achieved for its beneficiaries in response to their needs.

The article discusses some labour law aspects relevant to the activities of social service providers in terms of the introduced quality standard.

*Keywords:* Social services, quality of social services, qualification and professional development of the staff *JEL Codes:* K31

## REFERENCES

Mrachkov, M., (2015). Labour Law. Sofia: Sibi press (*Оригинално заглавие: Мръчков, В.,* 2015. Трудово право. София: Издателство "Сиби".)

# APPLICATION OF PUBLIC ORDER CONSIDERATIONS IN INTERNATIONAL FAMILY RELATIONS

**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 presence of an international element in family relations leads to the connection of this type of legal relationship with the legal systems of two or more countries claiming to regulate it by means of their own substantive legal regulations. In the cases where the internal conflict of law norm of the Bulgarian international private refers to the foreign legal order, it may come into conflict with the principles regulated in the Bulgarian law. This report examines the mechanism of action of the consideration of public order in international family relations and, more specifically, its negative and positive function.

Keywords: public order, marriage, family relations, collision;

#### REFERENCES

1. Todorov, T., Private International Law. The European Union and the Republic of Bulgaria, S., 2010; (**Оригинално заглавие:** Тодоров, Т., Международно частно право, Европейският съюз и Република България, С. 2010);

2. Todorov, T., International Family and Inheritance Relations. S. 1994; (**Оригинално** заглавие: Тодоров, Т., Международни семейни и наследствени правоотношения, С., 1994);

3. Vladimirov, I. Private International Law, General and special part, S. 2005; (**Оригинално заглавие:** Владимиров, И. Международно частно право, Обща и специална част, С. 2005);

4. Stancheva – Mincheva, V. Commentary on the Code of Private International Law. Comparison with acts of European law, S. 2010; (**Оригинално заглавие:** Станчева – Минчева, В., Коментар на Кодекса на международното частно право. Съпоставка с актовете на Европейското право, С. 2010);

5. Zidarova, Y., Public order and international private law, S.: Science and art, 1975; (**Оригинално заглавие:** Зидарова, Й., Общественият ред и международното частно право, С.: Наука и изкуство, 1975);

6. Erokhina, E. V., European family law, O., 2016; (**Оригинално заглавие:** Ерохина, E. В., Европейское семейное право, O., 2016);

7. Boguslavsky, M. M., Private International Law, M. 1999; (**Оригинално заглавие:** Богуславский, М. М., Международное частное право, М., 1999);

8. Getman - Pavlova, I. V., Private International Law, M. 2013; (**Оригинално заглавие:** Гетьман – Павлова, И. В., Международное частно право, М., 2013);

# GLOBALIZATION, MARRIAGE AND INTERNATIONAL LAW

#### Milena Dimova – PhD Student

Private Law Department, Faculty of Law, University of Ruse "Angel Kanchev" Tel.: +359 888919700 E-mail: mdimova@uni-ruse.bg

**Abstract:** The paper reviews international relations, which are based on globalization and on close relations in business, private lives, etc. legal relations, concentrating on family relationships. Persons take a different role in each relationship, and it is important to take an overview of marriage relations, including these ones with foreigners or getting married abroad in front of a domestic or foreign magistrate's office. The paper describes needed documents for getting married and the obligation for registration of the marriage in the own national register of the population.

**Keywords:** marriage, foreign marriage, marriage with foreigners, documents for marriage, registration of marriages in the citizenship country

#### REFERENCES

Vladimirov, I. (1998). International private law. General and special part. Sofia: "Sofi-R". (*Оригинално заглавие:* Владимиров, И. (1998). Международно частно право. Обща и специална част. София: "Софи-Р").

Natov, N., (2006). Commentary on the Code of Private International Law, Book One, Article 1-47. Sofia: "Siela". (*Оригинално заглавие:* Натов, Н., (2006). Коментар на кодекса на международното частно право, книга първа, член 1-47. София: "Сиела").

Todorov, T. (1994). International family and inheritance legal relations. Sofia: "University Publishing House St. St. Kliment Ohridski". (*Оригинално заглавие:* Тодоров, Т. (1994). Международни семейни и наследствени правоотношения. София: "Университетско издателство Св. Св. Климент Охридски".)

Todorov, T. (2007). International private law. The European Union and the Republic of Bulgaria. Sofia: "Sibi". (*Оригинално заглавие:* Тодоров, Т. (2007). Международното частно право. Европейският съюз и Република България. София: "Сиби".)

https://www.ciela.net/svobodna-zona-darjaven-

vestnik/document/1051479040/issue/3817/dogovor-mezhdu-narodna-republika-balgariya-i-polskata-narodna-republika-za-pravna-pomosht-i-pravni-otnosheniya-po-grazhdanski-semeyni-i-nakazatelni-dela-(ratifitsiran-s-ukaz-%E2%84%96-172/7iv1962-g-obn-v-izvestiya-br-31

 $https://ibl.bas.bg/rbe/lang/bg/\%\,D0\%\,B3\%\,D0\%\,BB\%\,D0\%\,BE\%\,D0\%\,B1\%\,D0\%\,B0\%\,D0\%\,BB\%\,D0\%\,B1\%\,D0\%\,B0\%\,D0\%\,BB\%\,D1\%\,BF/$ 

https://dv.parliament.bg/DVWeb/showMaterialDV.jsp?idMat=100536

https://www.parliament.bg/bg/const

https://www.lex.bg/laws/ldoc/2134455296

https://www.echr.coe.int/documents/convention\_bul.pdf

# BASIC CRIMINOLOGICAL CHARACTERISTICS OF THE OFFENDER ASSESSMENT SYSTEM

#### 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 report highlights the leading criminological characteristics of the offender assessment system implemented in Bulgarian prisons and probation services. It is the main tool for the study of convicted persons, giving the basic guidelines for the correctional work carried out during the execution of the sentence. Its structure and content are analyzed, which are compared with the achievements of criminological science. The assessment items are presented in the context of the cause of the criminal behaviour, noting their individual and cumulative effects on it. The main task of the report is to clarify the importance of assessment for the correction and re-education of offenders, which is one of the purposes of punishment.

Keywords: Criminal behaviour, punishment, assessment of offenders, correctional work, correction and reeducation

# **CRIMINOLOGY OF SOCIAL REACTION**

#### Chief Assistant Professor Ognyan Velev, PhD

Department of Criminal Law, Law Faculty, University of Ruse "Angel Kanchev"; Institute for the State and the Law, Bulgarian Academy of Sciences, E-mail: ovelev@uni-ruse.bg, ovelev@mail.bg

**Abstract:** The science of criminology is subject to various definitions. The main reason for this is the fact that there are different opinions about the scope of criminology. Traditionally it is seen as the science that studies the causes of crime. Since the 1960s, however, a significant number of criminologists have turned their scientific interest to the mechanisms of social reaction against crime. their research is known by the name "theories of social reaction" or "criminology of social reaction". This report aims to present the content of these theories.

Keywords: Criminology, Criminology of social reaction, Criminological theories, Sociology of Crime

#### REFERENCES

Bouloc, B., (2007). Criminal law. General part. Paris: Dalloz (*Оригинално заглавие:* Bouloc, B., 2007. Droit pénal général. Paris: Dalloz.)

Bouloc, B., (2005). Penology. Paris: Dalloz (*Оригинално заглавие: Bouloc, B., 2005*. *Pénologie. Paris: Dalloz.*)

Debuyst, Ch., Digneffe, F., Labadie, J-M., & Pires, A. P., (2008). History of knowledge about crime and punishment, v. 1. Bruxelles: Larcier (*Opurunanno заглавие: Debuyst, Ch., Digneffe, F., Labadie, J-M., Pires, A. P., 2008. Histoire des savoirs sur le crime et la peine, v. 1. Bruxelles: Larcier.*)

Debuyst, Ch., Digneffe, F., & Pires, A. P., (2008). History of knowledge about crime and punishment, v. 2. Bruxelles: Larcier (*Оригинално заглавие: Debuyst, Ch., Digneffe, F., Pires, A. P., 2008. Histoire des savoirs sur le crime et la peine, v. 2. Bruxelles: Larcier.*)

Debuyst, Ch., Digneffe, F., & Pires, A. P., (2008). History of knowledge about crime and punishment, v. 3. Bruxelles: Larcier (*Оригинално заглавие: Debuyst, Ch., Digneffe, F., Pires, A. P., 2008. Histoire des savoirs sur le crime et la peine, v. 3. Bruxelles: Larcier.*)

Faget, J., (2007). Sociology of delinquency and criminal justice. Toulouse: Editions érès (**Оригинално заглавие:** Faget, J., 2007. Sociologie de la délinquance et de la justice pénale. Toulouse: Editions érès.)

Gassin, R., (2007). Criminology. Paris: Dalloz (*Оригинално заглавие: Gassin, R., 2007. Criminologie. Paris: Dalloz.*)

Pin, X., (2010). Criminal law. General part. Paris: Dalloz (*Оригинално заглавие: Pin, X., 2010. Droit pénal général. Paris: Dalloz.*)

Velev, O., (2016). The Place of Probation among Criminal Sanctions (Comparative Study of Bulgarian and French Criminal Law). Sofia: Bulgarian Academy of Sciences (*Оригинално заглавие:* Велев, O., 2016. Мястото на пробацията сред наказателните санкции (съпоставително изследване по българското и френското наказателно право). София: Българска академия на науките.)

Velev, O., (2020). Sociological approach in criminology. In Legal collection of Burgas Free University, v. XXVII, 162-182 (**Оригинално заглавие:** Велев, O., 2020. Социологическо направление в криминологията. В Юридически сборник на Бургаски свободен университет, т. XXVII, 162-182.)

# **COMPARATIVE LAW REVIEW OF THE CRIMINAL SANCTION**

## Chief Assistant Professor Ognyan Velev, PhD

Department of Criminal Law, Law Faculty, University of Ruse "Angel Kanchev"; Institute for the State and the Law, Bulgarian Academy of Sciences, E-mail: ovelev@uni-ruse.bg, ovelev@mail.bg

**Abstract:** The interest of conducting a comparative study in the field of legal sciences has long been considered indisputable. The present work aims to offer the reader exactly this kind of study. The object of the research is the criminal sanction. As the most visible part of criminal law, the criminal sanction has always been an object of undoubted interest on the part of all who study this branch of law.

Keywords: Comparative Law, Criminal Law, Criminal Sanction, Punishment

#### REFERENCES

Bouloc, B., (2007). Criminal law. General part. Paris: Dalloz (*Оригинално заглавие:* Bouloc, B., 2007. Droit pénal général. Paris: Dalloz.)

Bouloc, B., (2005). Penology. Paris: Dalloz (Оригинално заглавие: Bouloc, B., 2005. Pénologie. Paris: Dalloz.)

Cuniberti, G., (2011). Main contemporary legal systems. Paris: L.G.D.J. (*Оригинално* заглавие: Cuniberti, G., 2011. Grands systèmes de droit contemporains, Paris: L.G.D.J.)

Pradel, J., (2016). Comparative criminal law. Paris: Dalloz (*Оригинално заглавие: Pradel, J., 2016. Droit penal compare. Paris: Dalloz.*)

Velev, O., (2016). The Place of Probation among Criminal Sanctions (Comparative Study of Bulgarian and French Criminal Law). Sofia: Bulgarian Academy of Sciences (*Оригинално заглавие:* Велев, O., 2016. Мястото на пробацията сред наказателните санкции (съпоставително изследване по българското и френското наказателно право). София: Българска академия на науките.)

## FRI-2B.312-1-NS-01

# POLITICAL CORRUPTION - A THREAT TO THE STATE

Assoc. Prof. Milen Ivanov, DcS Faculty of Law University of Ruse"Angel Kanchev" E-mail: mivanov@uni-ruse.bg

**Abstract:** The report examines the current state of the forms of political corruption in Bulgaria. Analyzes the causes of this phenomenon - its genesis and development. Conclusions have been made about the necessary preventive actions that will lead to the neutralization of its influence on the state administration and society as a whole and to the restoration of the democratic foundations of the state, as a pledge of national prosperity and survival of the nation.

*Keywords: Conclusions, political corruption JEL Codes:* 

## REFERENCES

Конституция на Република България, в сила от 13.07.1991 г. Обн. ДВ. бр.56 от 13 Юли 1991г.,

Ceva, E., Ferretti, M. P., Political Corruption, The Internal Enemy of Public Institutions, ISBN: 9780197567869, 2021

Council of Europe. Resolution 1736 (2010). Code of Good Practice in the Field of Political Parties. Council of Europe, Strasbourg, 2010.

Venice Commission and OSCE/ODIHR. Guidelines on Political Party Regulation. OSCE Office for Democratic Institutions and Human Rights and Venice Commission, Warsaw/Strasbourg, 2011 (CDL-AD(2010)024).

When Governments Break the Law: The Rule of Law and the Prosecution of the Bush Administration. NYU Press. 2010. ISBN 978-0-8147-4139-9. JSTOR j.ctt9qg520.

# MECHANISMS FOR DECISION-MAKING IN STATE MANAGEMENT

Assoc. Prof. Milen Ivanov, DcS Faculty of Law University of Ruse "Angel Kanchev" E-mail: mivanov@uni-ruse.bg

**Abstract:** The report examines the topical issue of how, who and why strategic decisions are made in public administration. The relationship between the sovereign and the executive power in the implementation of the basic principles of democracy is analyzed and conclusions are drawn about the necessary transformation of the state management system in accordance with the Constitution of the Republic of Belarus.

Keywords: Conclusions, public administration JEL Codes:

#### REFERENCES

Конституция на Република България, в сила от 13.07.1991 г. Обн. ДВ. бр.56 от 13 Юли 1991г.,

Понкин, И. В., Теория государственного управления: учебник, Высшее образованиые – Магистратура, INFRA-M, 2019

Basco, C. A., Strategy management in government agencies Focusing efforts for sustained effect, http://repiica.iica.int/docs/B0689i/B0689i.pdf (12.09.2022)

Walker, Richard M., Strategic Management and Performance in Public Organizations: Findings from the Miles and Snow Framework,

http://faculty.cbpp.uaa.alaska.edu/afgjp/PADM628%20Spring%202014/Stragegic%20Managemnt%20and%20Performance%20in%20Public%20Orgs.pdf

# SECURITY STUDIES IN CONTEMPORARY POLITICAL SCIENCE AND THEORY OF INTERNATIONAL RELATIONS

Assoc. Prof. Kremena Rayanova, PhD Faculty of Law University of Ruse "Angel Kanchev" E-mail: krayanova@uni-ruse.bg

**Abstract:** for traditionalists, the state is the main object of analysis. Security is about national survival in an anarchic world. Understanding the balance of power is the key to traditional security. The main task is to ensure the survival of the state. Because power is the best means of doing this, security research focuses on the role of military power.

The most widely held belief is that, in the long run, free market growth and new technologies solve more problems than they create. However, there is a perception that increasing prosperity and integration increase political instability. Prosperity leads to greater economic integration and dependence, which creates a sense of danger as it increases the importance of international economic relations and therefore increases potential friction

An increasing number of scholars, referring to the trends of globalization of world politics, the reduction of the share of interstate relations in it due to the growing role of non-state actors, propose to consider the traditional field of international law in a broader context of "regimes" of world politics, which are the most proven mechanism for arranging the systems of international relations.

*Keywords:* Security, The global system, The Security Council *JEL Codes:* 

#### REFERENCES

Caroline Thomas. Global Governance, Development and Human Security: Exploring the Links// *Third World Quarterly*, - Vol. 22. № 2. - P.159.

Michael T.Klare. Resource Competition and World Politics in the Twenty-First Century.// *Current History*, - December 2000. - P.404.

DCI National Intelligence Council. *Global Trends 2015.* - Washington, DC: GPO, December 2000

Steven Metz. Armed Conflict in the 21st Century: The Information Revolution and Post-Modern Warfare. - April 2000. - P.24

DCI National Intelligence Council. Global Trends 2010. - Washington, DC: GPO, November 1997.

Roland Paris. Human Security: Paradigm Shift or Hot Air?// International Security, -Vol.26, No.2 (Fall 2001).

# LEGAL ESSENCE OF THE DECISIONS OF THE REPUBLIC OF BULGARIA NATIONAL ASSEMBLY (ACTS ON DECLARATION OF MARTIAL LAW OR EMERGENCY STATE)

#### Assoc. Prof. Elitsa Kumanova, PhD

Department of Public Law, Law Faculty University of Ruse "Angel Kanchev" Phone: +359 884 980 050 E-mail: ekumanova@uni-ruse.bg

# **Stela Daskalova - PhD student** Department of Public Law, Law Faculty University of Ruse "Angel Kanchev" Tel.: +359883442833

E-mail: sdaskalova@uni-ruse.bg;

**Abstract:** The National assembly of Republic of Bulgaria performs its legislative role through the proposal, discussion and adoption of laws, decisions and declarations. In 2022, a reference note from the Directorate of "Plenary Sessions, Parliamentary Control and Final Texts" shows that 84 laws, 122 decisions and 1 declaration have been adopted in 2022.

Ssubject of this work is the methodology applied for adaption of the decisions of the National Assembly in Republic of Bulgaria, the legal principles to be followed and in particular the procedure of decision/s adaption of the National Assembly on the issue of declaring war (martial law), exclusion of peace, provision for help for third parties in case of martial law and / or an emergency situation/state, as well as decisions on internal affairs of martial law or emergency situation.

**Keywords:** decisions of the National Assembly; legal principles of the decision; decisions to declare martial law or state of emergency; functions of the National Assembly

# MEANING AND ESSENCE OF THE TERM "SPECIAL KNOWLEDGE" WHEN APPOINTING FORENSIC EXPERTISE IN THE CRIMINAL PROCESS

Assoc. Prof. Nevena Ruseva , PhD Department of Criminal Law, University of Ruse"Angel Kanchev " Phone: +359 88 623456 E-mail : nruseva@uni-bg.com

**Abstract:** The following article discusses the essence of the term "special knowledge" used in the Criminal Procedure of Republic of Bulgaria and its application in the implementation of the "expertise" method of proof. In criminal proceedings the use of special knowledge is carried out through the application of its different subtypes, namely by attracting knowledgeable people, specialists from various fields of science, technology or art to carry out a non-scientific research, one that can give an answer to the tasks arosen in the course of the investigation.

Keywords : special knowledge, expertise in criminal proceedings, research, science, technology, art

#### REFERENCES

Velev, O. (2019) *Migration crimes under Bulgarian criminal law*. Institute for the State and Law. St. 201-276

Danailova, A, Nikolaeva, G, Elagina, V. (2014) On some aspects of the use of special knowledge in the process of checking reports about the crime / Oryol State University Bulletin. Series: New Humanities Studies. 2014. No. 3 (38). pp. 15-18

Kalinkov, S. (2020). Law applicable to property relations between spouses according to Regulation (EU) No. 2016/1103, IK "Trud I Pravo", 11.2020.

Krushkova, S. (2022). THE EXPERT INTERVIEW - a KEY TOOL IN FORENSIC PSYCHOLOGICAL EXAMINATION OF VICTIMS OF VIOLENCE. Socio Brains. No 92, 68-72

Kumanova, E, Barbolova. A. (2022). *Comparative study of the involuntary hospitalization in a psychiatric hospital according to the Bulgarian legiaslation*. Ruse University press. 43-90

Raqnova, K. (2022). *Criminal environment and terrorism*. Conference of National Military University "Vasil Levski". 135-146

# OPERATIVE HEARING ON THE BULGARIAN CRIMINAL PROCEDURE CODE - ESSENCE AND SOME PROBLEMS.

#### Lyuboslav Lyubenov, PhD

Department of Criminal Law, University of Ruse "Angel Kanchev", Bulagaria Tel.: +359 883417447 E-mail: lvlyubenov@uni-ruse.bg

Abstract: with the amendments and additions to the Criminal Procedure Code of 2017, in the stage of preparatory actions for examination of the case in a court hearing of the first instance, an operative hearing was foreseen. The same is not judicial, but preparatory. However, as such, it deserves careful consideration because it represents a concrete manifestation of the current conception of the role of the court in the modern criminal process. In this report, it is precisely from this point of view that an answer is sought to the question, whether the operative hearing meets the basic principles of the process, of the Constitution of the Republic of Bulgaria and of the ECHR. In order to make this answer, which is one of the merits of the report itself, it is followed in detail whether the current formulation of the institute is compatible with the aspirations laid down in the motives of the Act Supplementing the Criminal Procedure Code of 2017, as well as whether the applying of the operative hearing leads to any significant practical utility.

*Keywords: criminal proceedings, operative hearing, fair trial, summary proceedings, prosecutor, accused party, court.* 

JEL Codes: K410, K420

#### REFERENCES

Chinova, M., Mitov, G. (2021). Kratak kurs lekcionen kurs po nakazatelnoprotsesualno pravo. Sofia: Izdatelstvo "Ciela". (**Оригинално заглавие:** Чинова. М., Митов. Г., 2021. Кратък лекционен курс по наказателнопроцесуално право. София: Издателство "Сиела".)

Lyubenov, L., More about the central role of court proceedings in the Bulgarian criminal process. Proceedings of University of Ruse - 2021, volume 60, book 7.2. p.52-57.

Manev. N. (2018). Razvitie na reformata na nakazatelnia process. Sofia: Izdatelstvo "Ciela". **Оригинално заглавие:** Манев. Н., 2018. Развитие на реформата на наказателния процес. София: Издателство "Сиела".)

Pavlov, S. (1996). Nakazatelen process na Republika Balgaria- Obshta chast. Sofia: Izdatelstvo "Sibi". (*Оригинално заглавие:* Павлов, С., 1996. Наказателен процес на Република България. София: Издателство "Сиби".)

Salov, I. (2014). Actualni vaprosi na nakazatelnia process. Sofia: Izdatelstvo "Nova Zvezda". (**Оригинално заглавие:** Сълов. И., 2014. Актуални въпроси на наказателния процес. София: Издателство "Нова звезда".)

Salov, I. (2002). Sadat razsledvascht organ, obvinitel ili arbitar v nakazatelnoto proizvodstvo. Sofia: Izdatelstvo "Feneya". (*Оригинално заглавие:* Сълов, И., 2002. Съдът – разследващ орган, обвинител или арбитър в наказателното производство. София: Издателство "Фенея".)

Harris, O' Boyle, Bates, Buckley, Warbrick. (2014). Law of the European convention on Human Rights. Oxford University Press.

# HISTORICAL DEVELOPMENT OF THE FIREARMS LICENSING REGIME

#### **Plamen Parvanov Penchev**

Department of Criminal Law, Ph.D. Student University of Ruse "Angel Kanchev" E-mail: pppenchev@uni-ruse.bg

**Abstract:** This presentation discusses the historical aspects that cover the regime under which the procedure for issuing and revoking an already issued firearm handling permit falls.

Keywords : firearm, permit regime, individual administrative act

#### REFERENCES

Davidov, M. (2006) Modern terrorism and the activity of the specialized bodies for the control of general dangerous means against it. Sofiq.

Krumov, R. (2022) *Issuing permits for activities with firearms and ammunition*. Academy of the Ministry of the Interior.

Krushkova, S. (2022). THE EXPERT INTERVIEW - a KEY TOOL IN FORENSIC PSYCHOLOGICAL EXAMINATION OF VICTIMS OF VIOLENCE. Socio Brains. No 92, 68-72

Raqnova, K. (2022). *Criminal environment and terrorism*. Conference of National Military University "Vasil Levski".

# SPECIFICITY OF THE FORENSIC PSYCHOLOGICAL EXAMINATION OF MINOR SUBJECTS, VICTIMS OF SEXUAL CRIMES

#### Assoc. Prof. Silvia Krushkova, PhD

Department of Public health and health care, "Angel Kanchev" Univesity of Ruse Phone: 0882517554 E-mail: krovshkova@mail.bg

**Abstract:** The article examines an extremely topical topic of forensic psychology, namely the specifics of preparing a forensic psychological conclusion for minors who have been the subject of sexual assault. Two main supporting aspects are noted in the clinical study of the group, on the one hand what is their clinical ability to give credible testimony, and on the other hand how the experience of sexual violence has affected and will affect their further development. In addition to the specifics questions that are the subject of the forensic psychological examination of minors victims of sexual violence, the basic steps of the methodology of conducting the overall research are presented, taking into account the calendar age and the trauma experienced by the sexual violence.

Keywords: forensic psychology, minors victims, sexual violence.

# FRI-K1-1-QHE-01

# THE ROLE OF INNOVATION PARTNERSHIPS IN THE CREATION OF INTELLECTUAL PROPERTY

## Principal Assistant Tzvetelin Gueorguiev, PhD

Department of Machine Tools and manufacturing, "Angel Kanchev" Univesity of Ruse Phone:+359 82 888 493 E-mail: tzgeorgiev@uni-ruse.bg

**Abstract:** The paper presents a methodology for uncovering, developing, nurturing and improving innovation partnerships. The basis of the partnership is the implemented innovation management system at the University of Ruse, Bulgaria. The innovation portfolio is the starting point which serves to create a short list of potential internal and external partners. The expected outputs of implementing the guidance of ISO 56003 are the innovation partnership agreements in combination with non-disclosure agreements. The plans for the future include targeting potential partners in order to improve the overall performance of the innovation management system and more specifically- to protect the intellectual property rights of the university and its community of researchers.

*Keywords:* Innovation Management Systems, Innovation Partnership, ISO 56003, University of Ruse. *JEL Codes:* D23, D85, L24, O30, O34

## REFERENCES

BDS EN ISO 56003:2021 Upravlenie na inovatsii. Sredstva I metodi pri partnyorstvo za inovatsii. Rakovodstvo (*Оригинално заглавие:* БДС EN ISO 56003:2021 Управление на иновации. Средства и методи при партньорство за иновации. Ръководство.).

CEN/TS 16555-5:2014 Innovation management - Part 5: Collaboration management.

ISO 56003:2019 Innovation management — Tools and methods for innovation partnership - Guidance.

SD CEN/TS 16555-5:2015 Upravlenie na inovatsii. Chast 5: Upravlenie na satrudnichestvo (**Оригинално заглавие:** СД CEN/TS 16555-5:2015 Управление на иновации. Част 5: Управление на сътрудничество).

# NEW POST-COVID REALITIES IN THE HIGHER SCHOOLS IN BULGARIA

#### Assoc. Prof. Tanya Grozeva, PhD

Department of Repair, Reliability, machinery, logistics and chemical technologies, "Angel Kanchev" Univesity of Ruse Phone: 082-888 258 E-mail: tgrozeva@uni-ruse.bg

**Abstract:** The post-Covid 19 period proved to be difficult and unclear for many of the higher education institutions in Bulgaria, due to the change in the conditions of study, research and internationalization. This also led to a new policy in the management of universities, in search of a true way to overcome a number of demographic, financial and technological problems. Regardless of the changes that have occurred, the tendency is to preserve the role of higher schools as a place for social development and cohesion, playing a role in the exchange of knowledge, for working in an atmosphere of mutual respect and recognition.

*Key words:* post-Covid 19 period, study, research and internationalization, new policies in higher education *JEL Codes:* 123

## REFERENCES

Curtin, R., 2021, Reimagining Higher Education: The Post-Covid Classroom, Educause review

Peycam, P., 2021. Imagining the university in the post-COVID world, THE NEWSLETTER 88 SPRING 2021, International institute for Asian studies

Pohl, T., 2022, Student Success in a Post-Covid Environment, University of Arcansas

The new normal: Higher education in a post-COVID-19 world, TIAA Institute, 2020

URL: https://stories.uh.edu/s21m-college-after-covid/index.html

URL: https://gradoscope.com/thenewnormal-education/

URL: https://www.frontiersin.org/articles/10.3389/feduc.2021.711619/full

Wasik, E., 2020, Bridging the Digital Divide to Engage Students in Higher Education, Economist Intelligence Unit (EIU) report, December 15, 2020, pp. 9, 10.

# LEGAL FRAME OF TRAINING IN SPECIALTIES FROM THE REGULATED PROFESSIONS IN THE FIELD OF HEALTH CARE

#### Assoc. prof. Elitsa Kumanova, PhD

Department of Public Law, Law Faculty, "Angel Kanchev" University of Ruse E-mail: ekumanova@uni-ruse.bg

Assoc. prof. Kiril Panayotov, PhD

Public Health and Health Care Faculty, "Angel Kanchev" University of Ruse E-mail: kpanajotov@uni-ruse.bg

#### Assoc. prof. Nikolina Angelova, PhD

Public Health and Health Care Faculty, "Angel Kanchev" University of Ruse E-mail: nangelova@uni-ruse.bg

## Fatme Minkova, PhD Student

Department of Public Law, Law Faculty, "Angel Kanchev" University of Ruse

**Abstract:** The legal frame of training in specialties from the regulated professions in Bulgarian higher education institutions follows the principles of the hierarchy of legal acts. The Guarantees the realization of the right to higher education as a basic right of citizens according to the Constitution are bound by general and special norms in different normative acts. The most comprehensive and precise is the legal framework of higher education in the field of health and health care, which is examined in the report by analyzing the norms of national, European and international legislation.

*Keywords:* higher educational institutions, regulated professions, right of education *JEL Codes:* K38

#### REFERENCES

European Union Law (2014). Cambridge: Cambridge University Press.

Mason and McCall Smith's Law and Medical Ethics (11th edn) (2019). Oxford: Oxford University Press

Zheleva, E. (2014). The Health Care Teacher - a Unique Person in the Profession. Proceedings of University of Ruse, vol. 53, book 8.3. Ruse: Ruse University press (*Оригинално заглавие*: Желева, Е, 2014. Преподавателят по здравни грижи – неповторима личност в професията. Научни трудове на Русенския университет, том. 53, сер. 8.3. Русе: Университетско издателство Русенски университет.)

URL: https://european-union.europa.eu/priorities-and-actions/actions-topic/health\_bg

# EFFECTIVENESS OF ONLINE LEARNING ON HEALTH CARE IN BULGARIA

#### Assoc. Prof. Galya Georgieva-Tsaneva, PhD

Institute of Robotics, Bulgarian Academy of Sciences Phone: 0878 111 283 E-mail: galitsaneva@abv.bg

## Prof. Ivanichka Serbezova, PhD

Department of Health care, "Angel Kanchev" University of Ruse Phone: +359 88 7082800 E-mail: iserbezova@uni-ruse.bg

Abstract: The report examines the application, methods and trends in online healthcare education in Bulgaria. Attention is paid to new, effective, modern methods for increasing the quality of online education. The extent to which online learning can replace proven traditional learning is debated. The article presents the results of a study on online education, conducted in April 2021 in a number of universities in Bulgaria, which train in the professional field of Health Care, specialty Nurse and Midwife. The results of the conducted survey among the trained students can serve to improve both online and face-to-face training through the use of innovative tools in health care education in Bulgaria. In both types of training, additional educational resources recommended by respondents can be included. The creation of new web-based educational resources (video materials, serious games, virtual simulations, video presentations, webinars, etc.) can supplement the traditional methods of training students in the professional direction "Health care", specialties Nurse and midwife in Bulgaria.

*Keywords: Quality of Education, Online Education, Health Education, Nurses and Midwives JEL Codes: 123* 

## REFERENCES

Association of American Medical Colleges (2007). Effective Use of Educational Technology in Medical Education Colloquium on Educational Technology: Recommendations and Guidelines for Medical Educators. URL: https://store.aamc.org/downloadable/download/sample/sample\_id/111/

Yotovska, K., Asenova, A., Nacheva. V. (2020). Quality of e-distance learning in the context of the COVID-19 pandemic (results from a survey of teachers' opinions). Science & Technologies, Volume X, 2020, Number 7: EDUCATION. (*Оригинално заглавие*: Йотовска, К., Асенова, А., Начева. В. (2020). Качество на електронното дистанционно обучение в условия напандемията от COVID-19 (резултати от проучване мнението на учители). Science & Technologies, Volume X, 2020, Number 7: EDUCATION.) URL: https://www.researchgate.net/publication/345158772\_KACESTVO\_NA\_ELEKTRONNOTO\_DI STANCIONNO\_OBUCENIE\_V\_USLOVIA\_NA\_PANDEMIATA\_OT\_COVID-19\_REZULTATI\_OT\_PROUCVANE\_MNENIETO\_NA\_UCITELI\_Science\_Technologies\_14\_Volume\_X\_2020 Number 7 EDUCATION (Accessed on 26.08.2022).

Moorle, M., Kearsley, G. 2011. Distance education: a systems view of online learning. (What's New in Education). URL: https://www.amazon.com/Distance-Education-Systems-Online-Learning/dp/1111520992

Saffari, Z., Takmil, F., Arabzadeh, R. (2014). The role of educational technology in medical education. Journal of Advances in Medical Education & Professionalism. Vol 2, No 4.

# HIGHER EDUCATION TEACHERS SURVEY FOR ESTABLISH THE INOVATIVE ELEMENTS IN INSTRUCTIONAL TECHNOLOGIES

#### Assoc. Prof. Tsvetelina Georgieva, PhD

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

## Assoc. Prof. Seher Kadirova, PhD

Department of Electronics, "Angel Kanchev" University of Ruse Phone: +359 82 888 741 E-mail: skadirova@uni-ruse.bg

## Kathryn Cormican, PhD

Enterprise Research Centre, National University of Ireland, Galway Phone: +353 876 896 500 E-mail: kathryn.cormican@nuigalway.ie

#### Suzana Cândido de Barros Sampaio, PhD

Enterprise Research Centre, National University of Ireland, Galway Phone: +353 91 524411 E-mail: suzana.sampaio@nuigalway.ie

#### Manon van Leeuwen

EU & international bidding expert and independent consultant, EOLAS.S.L., Spaine Phone: +34 689 57 84 87 E-mail: eolas.manon@gmail.com

## Prof. Özge Andiç Çakır, PhD

Engineering Faculty, Civil Engineering Department, EGE University, Izmir, Turkey Phone: +90 532 684 7647 E-mail: ozge.andic@.ege.edu.tr

#### Assoc. Prof. Firat Sarsar, PhD

Department of Computer Education and Instructional Technology, EGE University, Izmir, Turkey Phone: +90 505 778 7776 E-mail: firatsarsar@gmail.com

#### Assistant Prof. Nuno Pombo, PhD

Assisted Living Computing and Telecommunication Laboratory, University of Beira Interior, Portugal Phone: +351 275 329 953 E-mail: ngpombo@di.ubi.pt

Abstract: The paper presents higher education teachers survey for establish the inovative elements in instructional technologies. The survey is done under the project "HE Teachers and Institutions and Instructional

Technology (HIIT)", Erasmus+ programm; Action type KA220-HED - Cooperation partnerships in higher education. Planned activity in the project included conduct research; create educational initiatives; develop training; apply innovative approaches to teaching; provide teaching for staff; pilot test training; create an e-learning space based on instructional technology principles; disseminate and exploit the results; management activities; quality activities; team building activities. The main objective of this result (PR1) is to develop the curriculum, syllabus and learning approach for HE STEM teachers. Therefore, the first step is to define the skills and competence that these teachers need to be able to design, develop, use, manage, and evaluate the process of learning mediated by technology applications in their courses, i.e., the Instructional Technology skills and competences. The focus groups will take place with 10 teachers per focus group in each of the 4 participating HEIs. We reached to 13 STEM teachers for survey answers. They are from 4 Institutions and are specialists in 6 Areas of Higher Education: Automatics Engineer; Machine Engineer; Electrical Engineer; Transport Engineer; Physics Engineer and Information Technologies. The survey is organized in 6 main questions. All answers are analyzed. All the teachers from the focus group thing that the instructional technologies are promising and necessary.

Keywords: Instructional Technologies, Survey, Innovative Approaches JEL Codes: 121

## REFERENCES

Chaipidech, P., Kajonmanee, T., Chaipah, K., Panjaburee, P., & Srisawasdi, N. (2021). Implementation of an Andragogical Teacher Professional Development Training Program for Boosting TPACK in STEM Education: The Essential Role of a Personalized Learning System. Educational Technology & Society, 24 (4), 220–239.

Wanichsan, D., Panjaburee, P., & Chookaew, S. (2021). Enhancing knowledge integration from multiple experts to guiding personalized learning paths for testing and diagnostic systems. Computers and Education: Artificial Intelligence, 2, 100013.doi:10.1016/j.caeai.2021.100013

Tsuda, E., Sato, T., Wyant, J. D., & Hasegawa, E. (2019). Japanese elementary teachers' experiences of physical education professional development in depopulated rural school districts, Curriculum Studies in Health and Physical Education, 10(3), 262-276.

Winberg, C., Adendorff, H., Bozalek, V., Conana, H., Pallitt, N., Wolff, K., Olsson, T. & Roxå, T. (2019). Learning to teach STEM disciplines in higher education: a critical review of the literature, Teaching in Higher Education, 24 (8), 930-947, DOI: 10.1080/13562517.2018.1517735

# ANALYSIS OF RESULTS FROM EMPLOYER SURVEYS

#### Assoc. Prof. Kaloyan Stoyanov, PhD

Head of the Career Development Centre, "Angel Kanchev" Univesity of Ruse Phone: +359 82 888 425 E-mail: kes@uni-ruse.bg

## Petya Angelova, PhD

Career Development Centre, "Angel Kanchev" Univesity of Ruse Phone: +359 82 888 425 E-mail: pangelova@uni-ruse.bg

**Abstract:** The Center for Career Development at the University of Ruse "Angel Kanchev" permanently conducts a survey among partners, companies and institutions - employers, thus striving to comply with business requirements regarding staffing needs and quality of students graduating from the University of Ruse, here a survey of student opinion is also included. Based on the conducted research, feedback is provided to universities, faculties, departments and specialties on improving the quality of the educational process and its effectiveness in a competitive environment and good implementation in the labor market.

Keywords: Surveys, Analysis, Recommendations. JEL Codes: 121

#### REFERENCES

Dimitrov, V., 2017. Relacionen model na danni – izsledvane i formalizaciya (*Оригинално заглавие*: Димитров В., 2017. Релационен модел на данни - изследване и формализация. Издателство: УИ "Св.Кл.Охридски")

Djerald, N., 2007, Analiz na biznes danni s Excel (*Оригинално заглавие*: Найт Джералд., 2007. Анализ на бизнес данни с Excel, Издателство: ЗеСТ Прес)

# NOVEMBER RESEARCH CONFERENCE IN RAZGRAD

# FRI-ONLINE-KS(R)

FRI-LCR-KS(R)-01

# DIRECT SYNTHESIS OF GRAPHENE BY USING COMBINED ELECTROLYSIS AND ULTRASONIC METHODS

## Prof. Irena Markovska, PhD

Department of Chemical Technology Assen Zlatarov University, Burgas, Bulgaria E-mail: imarkovska@btu.bg

**Abstract:** Graphene is a new nanomaterial that possesses many amazing characteristics. It is believed that graphene is a next-generation conducting material with the potential to be used for obtaining of electrodes for supercapacitors. Graphene is a flat honeycomb lattice made of a single layer of carbon atoms and possed an unique properties - very high electrical conductivity, excellent mechanical properties, etc.

In the present paper, a monolayer graphene was synthesized by simultaneous application of electrolysis and ultrasound. High pure, finely dispersed graphite was used as precursor. Graphene is obtained as a result of a combination of chemical and physical treatment. Sulfuric acid was used as the electrolyte. It loosens the weak Van der Waals bonds and, together with the acoustic action of ultrasound, contributes to the cleavage of the individual layers of graphene.

The physico-chemical properties of the resulting graphene were haracterized by Raman spectroscopy, TEM, SEM, etc.

Keywords: graphene, ultrasonic method, electrolysis, TEM, SEM

#### Acknowledgement:

*This work was supported by the Bulgarian Ministry of Education and Science under the National Research Programme "E+: Low Carbon Energy for the Transport and Households, approved by DCM # 577 / 17.08.2018".* 

#### REFERENCES

Geim A.K., Novoselov K.S., (2007), The Rise of Graphene. Nature Mater., 6, 183-191.

Monah V.B., Lau K., Hui D., Bhattacharyy D., (2018), Graphene-based materials and their composites: a review on production, applications and product limitations, Composites Part B, 142, 200–220.

Neto A.C., Guinea F., Peres N.M., (2006), Drawing conclusions from graphene. Phys World, 19 (11), 33-37.

Gusev A.I., (2007), Nanomaterials, nanostructures, nanotechnologies, Fismmatt, Moscow, 416.

Gusev A.I., Rempel A.A., (2004), Nanocrystalline Materials. Cambridge: Cambridge International Science Publishing, 351.

Sreedhar D., Devireddy S., Veeredhi V.R., (2018), Synthesis and Study of Reduced Graphene Oxide layers under Microwave Irradiation, Materials Today, 5, 3403–3410.

Hummers Jr., W. S., Offeman R.E., (1958), Preparation of Graphitic Oxide, *Journal of American Chemical Society*, 80 (6), 1339.

## FRI-LCR-KS(R)-02

# THE INTERGENERATIONAL FAMILY BUSINESSES AS AN INSTRUMENT FOR DEVELOPMENT OF THE FOOD INDUSTRY

Assoc. Prof. Daniel Pavlov, PhD Department of Management and Social Work, University of Ruse "Angel Kanchev" Phone: 0884343132 E-mail: dpavlov@uni-ruse.bg

**Abstract:** The small food production firms have different challenges to survive the strong marketing competition with the big companies. They rely on the support, provided by their relatives and some strategic friends. But most of the young family members are not willing to work together with their parents due to variety of reasons. Instead, the youths could establish their own economic activities, which are linked to the firms of their parents. The purpose of this report is to present the student willingness to go for such businesses and the research has been organized within the INTERGEN international academic network, which focused to study the intergenerational family business as a stress management instrument.

*Keywords:* food production, vertical integration, family businesses *JEL Codes*: D1, M13

## REFERENCES

Antonova, D., Kunev, S., Venelinova, N., Kostadinova, I. (2021). Data Management Conceptual Algorithm of Transnational Digital Scientific Infrastructure as an Answer to the Globalization Challenges" // 20th International Scientific Conference Globalization and Its Socio-Economic Consequences, University of Zilina, Faculty of Operation and Economics of Transport and Communications. Publisher: EDP Sciences, SHS Web of Conferences 92, 0 (2021), pp.1-9, DOI:10.1051/shsconf/20219205002.

Bakracheva, M., Pavlov, D., Gudkov, Al., Diaconescu, A., Kostov, A., Deneva, A., Kume, A., Wójcik-Karpacz, A., Zagorcheva, D., Zhelezova-Mindizova, D., Dedkova, E., Haska, E., Stanimirov, E., Strauti, G., Taucean, I., Jovanović, I., Karpacz, J., Ciurea, J., Rudawska, J., Ivascu, L., Milos, L., Manciu, V., Sheresheva, M., Tamasila, M., Veličković, M., Damyanova, St., Demyen, S., Kume, V., Blazheva, V. (2020). *The intergenerational family businesses as a stress management instrument for entrepreneurs (Vol.1)*. Academic Publisher University of Ruse "Angel Kanchev". URL: http://intergen-theory.eu/INTERGEN-BOOK-1.pdf.

Boneva, M. (2018). Challenges Related to the Digital Transformation of Business Companies // The 6th International Conference Innovation Management, Entrepreneurship and Sustainabil-ity (IMES 2018), Prague, 2018, 101-114. https://publications.uni-ruse.bg/publication/21714

Antonova, D., Pavlov, D., Nedylkov, A., Kunev, S., Nizamov, A., Namazova, N., Shokirov, K., Azimov, B., Urinov, B., Komilov, A., Berdiev, A., Diyarov, F., Tuychiev, A., Anvarov, A., Kenjaboev, S., Rudawska, J., Mazurkiewicz, S., Kaminska, A., Depczynska, A., Rodríguez-Herrera, G., Falcón-Martel, A. (2016) *WP 1 "BUILDING THE KNOWLEDGE BASIS" - Towards the Modernisation of Higher Education Institutions in Uzbekistan (MATcHES)*. PRIMAX, Bulgaria. pp. 343 ISBN: 978-619-7242-15-72016, https://www.academia.edu/30048084

Kirova, M., Nedyalkov, A., Pencheva, M., Yordanova, D. (2018). University as Prerequisite for Sustainable Regional Development in International Context. // Proceedings of the 18th International Scientific Conference Globalization and Its Socio-Economic Consequences, University of Zilina, Slovak Republic, 10-11 October 2018, pp. 2578-2585, ISBN 2454-0943. URL: https://www.researchgate.net/publication/329802157

Kostadinova I. (2019). Digital Models for Transformation of Corporate Social Responsibility Education // Conference Proceedings of 29th Annual Conference of the European Association for

*Education in Electrical and Information Engineering – EAEEIE 2019*, IEEE Digital Xplore., 2019, 277-281. DOI 10.1109.EAEEIE46886.2019

Kunev, S., Antonova, D., Kostadinova, I. (2020). Improving the capacity for adoption of renewable energy sources in transport and logistics: approbation of a methodological approach. // 2020 Fifth Junior Conference on Lighting (Lighting), DOI: 10.1109/Lighting47792.2020.9240589.

Pavlov, D., Sheresheva, M., Perello, M. (2017). The Intergenerational Small Family Enterprises as Strategic Entities for the Future of the European Civilization - a Point of View // *Journal of Entrepreneurship & Innovation*, 2017, issue 9, p.p. 26-38, ISSN 1314-0175. http://jei.uni-ruse.bg/Issue-2017/10.%20Pavlov\_Sheresheva\_Perello.pdf

Ruskova, S., M. Todorova. (2016). Comparative Analysis of Culture Influence of Bulgarian and Russian Consumer's Behaviour.// *Journal of Entrepreneurship and Innovation*, 2016, No 8, pp. 81-102, ISSN 1314-0175. http://jei.uni-ruse.bg/Issue-2016/07.%20Ruskova%20-%20Todorova.pdf

Stoycheva, B., D. Antonova. (2018). Investigating Factor Interactions in Formalising the Process of Developing New Products // *Serbian Journal of Management*. 2018, No vol 13, № 1, pp. 173-184, URL: http://aseestant.ceon.rs/index.php/sjm/article/view/16409/pdf
# FRI-LCR-1-CT(R)

## FRI-LCR-1-CT(R)-01

# OBTAINING CORUNDUM CERAMIC SAMPLES INCORPORATED GRAPHENE

## Eng. Margarita Georgieva, PhD student

Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: margaritageorgieva727@gmail.com

#### Assoc.Prof. Adriana Georgieva, Phd

Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: adriana\_georgieva79@yahoo.com

## Chef Assistant Fila Yovkova, PhD

Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: fila\_03@abv.bg

#### Chef Assistant Krasi Panayotova, PhD

Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: krasi2502@gmail.com

**Abstract:** Traditional ceramics are characterized by high inflexibility, high melting temperature, high thermal stability and wear resistance, but its application is limited due to low crack resistance and poor electrical conductivity. Introduction of fillers into ceramic matrices appears to be an effective approach to address these issues. As a representative of two-dimensional materials, graphene is a promising filler in this respect due to its outstanding properties: excellent mechanical properties, high electrical conductivity, high thermal conductivity, etc. The incorporation of graphene nanostructures in ceramics offers new opportunities to improve existing and impart a variety of new properties to ceramic materials. The preparation of corundum ceramic samples with incorporated graphene structures is described in this paper.

Keywords: graphene/Al<sub>2</sub>O<sub>3</sub> composites, ceramic fillers, graphene structures

## FRI-LCR-1-CT(R)-02

## A NEW LOOK ON THE TITRATION OF WEAK ELEGCTROLYTES: APPLICATION OF THE LEAST SQUARES METHOD

**Petar Petrov, PhD** Pro M Consulting, Silistra, Bulgaria E-mail: consulting.pro.m@gmail.com

Abstract: The paper presents an application of the least squares method for simultaneous determination of weak and strong acids concentrations in a solution using potentiometric titration with strong base. In contrast to the traditional understanding of the acid-base titration process, where the equivalent point is found through the position of the inflection point and/or the rapid change of the pH value, we suggest to use the whole titration curve in order to find the unknown concentrations. This is helpful in many cases, where the titration curve does not have the typical form with well defined equivalent point, as for example titration of mixture of very weak and strong acids, diluted solutions and many other cases. We developed a mathematical model for the simulation of the titration of weak and strong acids with strong base. As a next step, this model was adapted for determination of the acids' concentrations using the least squares method. It was tested on two different titration experiments, namely the potentiometric titration of acetic acid and HCl mixture with NaOH. The two unknown parameters for the least squares algorithm were the concentrations of the both acids. The deviations between predicted concentrations and the real values are acceptable, and depends mainly on the pH-meter calibration. This approach could be easily extended for titration of very weak electrolytes or other similar applications.

Keywords: Titration, pH, weak electrolyte, least squares method, simulation

#### REFERENCES

Agustin G. Asuero, T. M., 2011. Comprehensive Formulation of Titration Curves for Complex Acid-Base Systems and Its Analytical Implications. *Critical Reviews in Analytical Chemistry*, Volume 41, p. 151.

Arocena, M., 2022. a simple theoretical, quantitative approach to help understand the titration of weak acids and bases. *Chemistry Teacher International*, Volume 4(1), pp. 47-54.

Caro, C. A. D., 2020. Simultaneous Determination of Acid Contents in Mixtures. *Mettler Toledo*.

G. Arena, E. R. S. S. C. R., 1979. a non-linera least-squares approach to the refinement of all parameters involved in acid-base titrations. *Talanta*, Volume 26.

Glaister, P., 1994. a titration model - an analysis and solution. *International Journal of Mathematical Education in Science and Technology*, 25(3), pp. 399-406.

Huang Xuezheng, L. Y. Z. L., 2013. The computer simulation of the acid-base titration. *Advanced Materials Research*, Volume 634-638, pp. 20-24.

Warren E. Stewart, M. C., 2008. Computer-Aided Modeling of Reactive Systems. s.l.:Wiley.

## FRI-LCR-1-BFT(R)-01

# FERMENTATION TECHNOLOGY OF LEAVES FOR FLAVORED DRINKS

## Assoc. Prof. Halyna Dubova, Candidate of Technical Sciences

Department of Translational Medical Bioengineering, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" E-mail: hdubova16@gmail.com

Senior Researcher, Iryna Levchuk, DcS Head of the scientific-methodical laboratories chromatographic studies SE «Ukrmetrteststandart», Ukraine E-mail: iryna.levchuk.v@gmail.com

## Senior Researcher, Olha Holubets, Candidate of Agricultural Sciences

The scientific-methodical laboratories chromatographic studies SE «Ukrmetrteststandart», Ukraine E-mail: iryna.levchuk.v@gmail.com

## Master student, Vladyslav Miroshnikov

Department of Food Technologies Poltava State Agrarian University, Ukraine E-mail: vladyslav.miroshnikov@st.pdaa.edu.ua

Abstract: The article shows options for fermenting tree leaves (cherries, apricots, lindens) and berries (raspberries, currants) to obtain aromatic raw materials. The purpose of the work is to obtain a modernized technology for obtaining dried leaves with the aroma of the corresponding fruits or berries. to obtain the desired effect, the possibility of using the tea leaf preparation technology was investigated. The basis of this technology consists of three main operations of preparing the leaf for drying - partial dehydration (or cold drying), leaf rolling, fermentation in a semi-closed vessel. Further, the fermented leaves are dried according to special regimes. It was found that the technology of tea leaf preparation can be successfully used for leaves of trees and berries. Three basic operations make it possible to obtain flavored leaves. The article shows that the intensity of the aroma and its correspondence to fruits and berries to a large extent depends on the conditions for the first operation - cold drying. The result of the study is that partial dehydration can be successfully carried out in two ways - classical (sheet packing in fabric layers) and modernized (freezing followed by defrosting). The upgraded method makes it possible to simplify the subsequent twisting operation and shorten the duration of fermentation Drinks from the leaves after fermentation are an alternative or a good addition to herbal teas.

Keywords: Fruit Tree Leaves, Berry Leaves, Fermentation, Tannins, Aroma

## REFERENCES

Hrynenko, I., Hrushetskyi, R., & Khomichak, L. (2019). Fermented leaves of fruit and berry crops as a raw material for drinks. *Food Resources*, 7 (13), 59-68.

Sinija, V. R., Mishra, H. N., & Bal, S. (2007). Process technology for production of soluble tea powder. *Journal of Food Engineering*, 82(3), 276-283.

Sharma, A., & Dutta, P. P. (2018). Scientific and technological aspects of tea drying and withering: a review. *Agricultural Engineering International: CIGR Journal*, 20(4), 210-220.

Lee, M. K., Kim, H. W., Lee, S. H., Kim, Y. J., Asamenew, G., Choi, J., ... & Kim, J. B. (2019). Characterization of catechins, theaflavins, and flavonols by leaf processing step in green and black teas (Camellia sinensis) using UPLC-DAD-QToF/MS. *European Food Research and Technology*, 245(5), 997-1010.

Chatterjee, P., Chandra, S., Dey, P., & Bhattacharya, S. (2012). Evaluation of antiinflammatory effects of green tea and black tea: a comparative in vitro study. *Journal of advanced pharmaceutical technology* & *research*, *3*(2), 136.

Kong, J., Yang, X., Zuo, X., Su, X., Hu, B., & Liang, X. (2022). High-quality instant black tea manufactured using fresh tea leaves by two-stage submerged enzymatic processing. *Food Science and Human Wellness*, 11(3), 676-685.

Lou, W., Bezusov, A., Li, B., & Dubova, H. (2019). Recent advances in studying tannic acid and its interaction with proteins and polysaccharides. *Food science and technology*. 13 (3), 65-69.

Qu, F., Zhu, X., Ai, Z., Ai, Y., Qiu, F., & Ni, D. (2019). Effect of different drying methods on the sensory quality and chemical components of black tea. *Lwt*, *99*, 112-118.

Davronovich, B. I., & Niyozovich, N. H. (2021). The technology of making refreshing tea based on tea lilies. *Texas Journal of Multidisciplinary Studies*, *3*, 85-92.

Mizutani, M., et al. (2002). Cloning of  $\beta$ -primeverosidase from tea leaves, a key enzyme in tea aroma formation. *Plant Physiology*, *130*(4), 2164-2176.

Yano, M., Okada, K., Kubota, K., & Kobayashi, A. (1990). Studies on the precursors of monoterpene alcohols in tea leaves. *Agricultural and Biological Chemistry*, 54(4), 1023-1028.

Liang, Z., et al. (2022). Glycosidically bound aroma precursors in fruits: a comprehensive review. *Critical Reviews in Food Science and Nutrition*, 62(1), 215-243.

Knapp, H., Straubinger, M., Stingl, C., & Winterhalter, P. (2002). *Analysis of norisoprenoid aroma precursors*. Carotenoid-Derived Aroma Compounds. Chapter 2. 20-35.

## FRI-LCR-1-BFT(R)-02

# ANETHOLE ISOLATION, SYNTHESIS, PROPERTIES: BRIEF OVERVIEW

## Martina Pencheva, PhD Student

Agrarian and Industrial Department "Angel Kanchev" University of Ruse E-mail: mypencheva@uni-ruse.bg

## Iliana Nikolova, PhD

Department of Chemistry, Food and Biotechnologies, Razgrad Branch "Angel Kanchev" University of Ruse E-mail: inikolova@uni-ruse.bg

## Prof. Stanka Damyanova, DSc

Department of Chemistry, Food and Biotechnologies, Razgrad Branch "Angel Kanchev" University of Ruse E-mail: sdamianova@uni-ruse.bg

## Prof. Albena Stoyanova, DSc

Department of Tobacco, Sugar, Vegetable and Essential Oils, Technological Faculty University of Food Technologies, Plovdiv E-mail: aastst@abv.bg

**Abstract**: The aim of the present paper was to review the chemical and biological characteristics of the anetole, its isolation and synthesis. It is one of the main isolates in the global essential oil industry. It is obtained from three types of oils - anise, badian (star anise) and fennel by crystallization and rectification. Anethole is an aromatic substance with exclusive use in the food industry, cosmetics, medicine, technology and other spheres of human life.

Key words: Anethol, isolation, synthesis, properties

## REFERENCES

Aschenbeck, K., Hylwa, S. (2017). Brushing your way to allergic contact dermatitis: Anethole allergy, Dermatitis, v. 28, 219-220.

Bauer, K., Garbe, D., Surburg, H. (2001). Common fragrance and flavor materials. Preparation, properties and uses, fourth completely revised Edition, Weinheim, New York, Chichester, Brisbane, Singapore, Toronto, Wiley – VCH,.

Berger, R. (2007). Flavours and Fragrances Chemistry, Bioprocessing and Sustainability, Springer Berlin Heidelberg New York

Freire, R., Morais, S., Catunda-Junior, F., Pinheiro, D. (2005). Synthesis and antioxidant, antiinflammatory and gastroprotector activities of anethole and related compounds, Bioorganic & Medicinal Chemistry, v. 13, No 13, 4353-435

Giustarini, D., Fanti, P., Sparatore, A., Matteucci, E., Rossi, R. (2014). Anethole dithiolethione lowers the homocysteine and raises the glutathione levels in solid tissues and plasma of rats: a novel non-vitamin homocysteine-lowering agent. Biochemical Pharmacology, v. 89, No 2, 246-254.

## FRI-LCR-1-BFT(R)-03

# PRESERVATIVES USED IN FOOD –ANTIOXIDANT ACTIVITY AND SPECTRA IN UV-VIS, MID-INFRARED REGION

## Assist. Prof. Mariya Georgieva, PhD

Department of Structural Crystallography and Material Science, Institute of Mineralogy and Crystallography, "Akad. Ivan Kostov" E-mail: mgeorgieva@imc.bas.bg

Abstract: Preservatives are added to protect processed foods against microbial contamination. Antioxidants are additives that prevent oxidation and lengthen the shelf life of food. Preservatives and antioxidants have different technological functions in food. The aim of the present study was to determine and compare the antioxidant activity by analytical spectroscopic methods of widely used and available preservatives in both the food industry and household, such as ascorbic acid, acetylsalicylic acid, citric acid, potassium sorbate, and sodium benzoate.

**Keywords:** Preservatives, Antioxidant activity, Ascorbic acid, Acetylsalicylic acid, Citric acid, Potassium sorbate, Sodium benzoate.

## FRI-LCR-P-2-CT(R)-01

## POSSIBILITIES FOR THE PREPARATION OF CERAMIC MATERIALS INCORPORATING GRAPHENE AND CARBONATE NANOSTRUCTURES

Assoc. Prof. Adriana Georgieva, PhD Chef Assistant Fila Yovkova, PhD Chef Assistant Krasi Panayotova, PhD Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: adriana\_georgieva79@yahoo.com E-mail: fila\_03@abv.bg E-mail: krasi2502@gmail.com

Eng. Margarita Georgieva, PhD student Eng. Mariela Minova, PhD student Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: margaritageorgieva727@gmail.com E-mail: minova\_m@abv.bg

**Abstract:** There is a growing worldwide effort to produce new ceramic materials that combine the unique functional (electrical, magnetic, mechanical, etc.) properties of nanocomposite material with the properties of ceramic materials. In the production of ceramic and composite materials with specific properties, nanotechnology plays a significant role in obtaining the starting components in a finely dispersed state, which not only intensifies the synthesis process but also leads to improved and reproducible product properties. In this paper, a review of the possibilities of preparing ceramic materials incorporating graphene and carbonate nanostructures is presented.

Keywords: nanotechnology, ceramic materials, graphene nanostructures, carbonate nanoparticles

# MICROWAVE-ASSISTED SYNTHESIS OF COST-EFFECTIVE AND ENVIRONMENTALLY FRIENDLY ELECTROCHEMICAL MATERIALS

Assist. Prof., Ivelina Tsacheva, PhD Institute of Polymers-BAS, Sofia, Bulgaria E-mail: itsacheva@polymer.bas.bg

Res. Assoc., Mariela Dimitorova, PhD Adriana Gigova Res. Assist., Ognyan Dimitrov Res. Assoc., Dzhamal Uzun, PhD Institute of Electrochemistry and Energy Systems "Academician Evgeni Budevski", Bulgarian Academy of Sciences, Bulgaria E-mail: mariela.dimitrova@iees.bas.bg E-mail: a.gigova@iees.bas.bg E-mail: ognian.dimitrov@iees.bas.bg E-mail: dzhamal.uzun@iees.bas.bg

**Abstract:** Here we report the microwave-assisted synthesis of nanocomposites from natural zeolite and cellulose phosphate. Microwave irradiation conditions, such as irradiation power and time, required to optimize the synthesis of zeolite electrochemical materials were studied.

The growing interest in the use of zeolite-modified electrodes results from the specific framework structure, containing the three-dimensional system of cages, and channels with various shapes, sizes, and topologies (Chen, C.Y., et al). their molecular sieve properties and ability to undergo the ion-exchange process with transition metals result in their catalytic property (Guzmán-Vargas, A., et al; Porada, R., et al). Cellulose-based materials also show interesting electrochemical properties and will be interesting to study their application of it for hydrogen production (Marzouki, R., et al).

The electrolytic model solution content of 1 M KOH and 18 g.l<sup>-1</sup> NaCl. The electrocatalysts were characterized by SEM, XRD, and BET. The electrodes are studied electrochemically by means of cyclic voltammetry, galvanostatic measurements, and Tafel slopes. The electrodes are designed and optimized in terms of the amount of composites.

Keywords: microwave assisted synthesis, cellulose phosphate, natural zeolite, seawater, electrocatalysts

Acknowledgments: \_The authors kindly acknowledge the financial support of the project № BG05M2OP001-1.002-0014 "Center of competence HITMOBIL-Technologies and systems for generation, storage and consumption of clean energy", funded by Operational Programme "Science and Education for Smart Growth" 2014–2020, co-funded by the EU from European Regional Development Fund.

## REFERENCES

Chen, C.Y., Ouyang, X., Zones, S.I. Banach, S.A., Elomari S.A., Davis, T.M., Ojo, A.F. (2012). *Microporous Mesoporous Mater.*, 164, 71-81.

Guzmán-Vargas, A., Oliver-Tolentino, M.A., Lima, E., Flores-Morenod, (2013). J. Electrochim. Acta., 108, 583-590.

Marzouki, R., Brahmia, A., Q. Alsulami, A, Keshk SMAS, Emwas A.-H., Jaremko, M., Zid, M.F., Heinze, T. (2021). *Polymer International*, 70, 1290-1297.

Porada, R., Fendrych, K., Baś, B. (2021). Measurement, 179, 109450-109461.

# UNCERTAINTIES IN THE DESIGN OF SUPPLY CHAIN FOR BIODIESEL WITHIN THE REPUBLIC OF BULGARIA

## Ch. Asst. Prof. eng. Evgeniy Ganev, PhD

Process Systems Engineering Laboratory, Institute of Chemical Engineering, Bulgarian Academy of Sciences of Sofia, Bulgaria E-mail: evgeniy\_ganev@iche.bas.bg

## Eng. Yunzile Dzhelil, PhD

Process Systems Engineering Laboratory, Institute of Chemical Engineering, Bulgarian Academy of Sciences, Sofia. Bulgaria E-mail: unzile\_20@abv.bg

Abstract: The problem discussed in this article can generally be expressed as follows. We have a range of energy crops that need to be converted to biodiesel, which include crops such as sunflower, rapeseed and others. We envisage a ten-year planning horizon that includes government regulations, manufacturing, construction and a carbon tax. for the purposes of the study, a model of a biodiesel resource supply chain has been developed, including a set of collection points and a number of search areas, as well as potential locations for individual facilities and biorefineries. In order to compile the optimization model of a sustainable resource-supply chain, we need to take into account the uncertainties related to supply and transport. for this reason, we use a scenario-generating campaign. We consider two scenarios: centralized mixing of biodiesel with petroleum diesel in the appropriate ratio for the period and diversified. We will monitor the impact of each of the scenarios on the price of the finished product and the amount of greenhouse gas emissions over the entire life cycle of the fuel. Based on the obtained results, conclusions have been formed in favor of the diversification scenario, which will serve as a guide in the development of the problem, including the construction of a mathematical model in conditions of uncertainty.

Keywords: biodiesel, sustainable supply chain, modeling, uncertainties, scenarios

Acknowledgments: This study was carried out with the financial support of National Science Fund, Ministry of Education and Science of the Republic of Bulgaria, Contract No. KII-06-H37/5/06.12.19.

## REFERENCES

Carla Caldeira, Omar Swei, Fausto Freire, Luis, C. Dias, Elsa, A. Olivetti, Randolph Kirchain (2019), *Planning strategies to address operational and price uncertainty in biodiesel production*. Applied Energy, Volume 238, 2019, Pages 1573-1581, ISSN 0306-2619, https://doi.org/10.1016/j.apenergy.01.195

Doliente, S., Samsatli, S., (2020), *Integrated production of fuels, energy and chemicals from Jatropha curcas: multiobjective optimisation of sustainable value chains*. Chemical Engineering Transactions. 80, 343-348.

Evgeniy Ganev, Boyan Ivanov, Natasha Vaklieva-Bancheva, Elisaveta Kirilova, Yunzile Dzhelil (2021), a *Multi-Objective Approach toward Optimal Design of Sustainable Integrated Biodiesel/Diesel Supply Chain Based on First- and Second-Generation Feedstock with Solid Waste Use.* Energies, 14, 2261, https://doi.org/10.3390/en14082261

Ganev, E., Dzhelil, Y., Ivanov, B., Vaklieva-Bancheva, N., Kirilova, K., (2020), *Optimal design of a sustainable integrated biodiesel/diesel supply chain using first and second generations bioresources*. Chemical Engineering Transactions. 81, 67-72.

Habib, M. S., Asghar, O., Hussain, A., Imran, M., Mughal, M. P., Sarkar, B., (2021), a robust possibilistic programming approach toward animal fat-based biodiesel supply chain network design under uncertain environment. Journal of Cleaner Production. 278, 122403.

Mohtashami, Z., Bozorgi-Amiri, A., Tavakkoli-Moghaddam, R., (2021), a two-stage multiobjective second generation biodiesel supply chain design considering social sustainability: a case study. Energy. 233, 121020.

Pieter Bot, Dirk Pieter van Donk, Bartjan Pennink, Togar M. Simatupang (2015), *Uncertainties in the Bidirectional Biodiesel Supply Chain*. Journal of Cleaner Production, Volume 95, Pages 174-183, ISSN 0959-6526, https://doi.org/10.1016/j.jclepro.2015.02.064

Shah, S.H., Raja, I.A., Rizwan, M., Rashid, N., Mahmood, Q., Shah, F.A., Pervez, A. (2018), *Potential of microalgal biodiesel production and its sustainability perspectives in Pakistan, Renew.* Sustain. Energy Rev. 81, pp. 76-92, 10.1016/j.rser.2017.07.044

# INFLUENCE OF THE HEAT TREATMENT ON THE TENDENCY TO INTERGRANULAR CORROSION OF AUSTENITIC STAINLESS STEEL AISI 321

#### Assistant. Prof. Mariana Ilieva, PhD

Department of Materials Science and Technology, "Angel Kanchev" University of Ruse E-mail: mdilieva@uni-ruse.bg

**Abstract:** The paper presents the results of electrochemical testing on intergranular corrosion of stainless steel AISI 321. AISI 321 was subjected to quenching at 1050°C, sensibilization at 650°C and stabilizing annealing at 850°C. Experiments were done in a 5%  $H_2SO_4$  water solution to determine the susceptibility of the steel in different conditions to intergranular corrosion attacks. The open circuit potential was measured till reaching a stable value of the steedy state potential, and then anodic polarization was performed in the range -300...+1600 mV. The results from potentiodynamic polarization allowed to choose an etching potential in the transpassive region to reveal the tendency of the steel to intergranular attacks and the microstructure. It was found that the sensibilization for one hour at 650°C led to microstructural changes favorable to increased tendency to intergranular corrosion. This result suggests that, though AISI 321 is alloyed with titanium, additional heat treatment must be taken to overcome the possibility of intergranular corrosion provoked by the changed microstructure during different technological processes, such as welding.

Keywords: Stainless steel, Intergranular corrosion, Microstructure, Electrochemical corrosion

#### REFERENCES

Aaltonen, P., Aho-Mantila, I. & Hännien, H., 1983. Electrochemical methods for testing the intergranular corrosion susceptibility of stainless steels. *Corrosion Science, Vol. 23, No. 4*, pp. 431-440.

Cihal, V. & Prazak, M., 1960. a contribution to the explanation of intergranular corrosion of chromium-nickel steel. *Corrosion - National Assocoation of Corrosion Engineering, Vol. 16*, pp. 138-140.

Dabossi, F., Beranger, G. & Baroux, B., 1994. Corrosion localiseé. s.l.:Les Editions de Physique.

Davis, J. R., 2000. Corrosion, Understanding the basis. s.l.:ASM International.

Fauvet, P. et al., 2008. Corrosion mechanisms of austenitic stainless steels in nitric media used in reprocessing plants. *Journal of Nuclear Materials, Volume 375, Issue 1*, pp. 52-64.

G102-89, 1999. Standard Practice for Calculation of Corrosion Rates and Related information from Electrochemical Measurements, s.l.: s.n

Hrbac, J., Halouzka, V., Trnkova, L. & Vacek, J., 2014. eL-Chem Viewer: a Freeware Package for the Analysis of Electroanalytical Data and their Post-Acquisition Processing. *Sensors*, pp. 13943-13954.

Landolt, D., 2007. Corrosion and Surface Chemistry of Metals. s.l.: EPFL Press.

Padilha, A. F. & Rios, P. R., 2002. Decomposition of Austenite in Austenitic Stainless Steels. *ISIJ International, Vol. 42, No. 4,* pp. 325-337.

# SYNTHESIS AND PHYSICOCHEMICAL CHARACTERIZATION OF NOVEL ZIRCONIUM AND HAFNIUM TELLURITES

## Georgi Rusev

Department of Chemistry, "Prof. D-r Asen Zlatarov" University of Burgas E-mail: grussev71@gmail.com

Assoc. Prof. Svetlana Genieva, PhD Department of Chemistrt, "Prof. D-r Asen Zlatarov" University of Burgas E-mail: sgenieva@btu.bg

**Abstract:** Novel tellurites of zirconium and hafnium ZrTeO<sub>4</sub> and HfTeO<sub>4</sub> were synthesized by the hydrothermal reaction of ZrOCl<sub>2</sub>·8H<sub>2</sub>O, HfCl4, respectively, TeO<sub>2</sub>, and water. The phases were analyzed by Powder diffraction and FTIR spectroscopy. The tellurites crystallize in monoclinic system, space group C2/m, with crystallographic parameters: a = 9.9358(18) Å, b = 4.0117(73) Å, c = 8.5165(89) Å,  $\beta = 108.41(6)^{\circ}$  for ZrTeO<sub>4</sub> and a = 9.9104(25) Å, b = 3.9940(31) Å, c = 8.5136(27) Å,  $\beta = 108.33(5)^{\circ}$  for HfTeO<sub>4</sub>. Due to their extremely close atomic (Hf 1.442Å, Zr 1.452Å) and ionic radii (Hf<sup>4+</sup> 0.75Å, Zr<sup>4+</sup> 0.74Å) and the identical structure of the inner electronic shell, the chemical properties and crystal-chemical characteristics of their compounds are obviously very similar. Data were collected on a Bruker D8 Advance diffractometer at 293K in the range of  $8 < 2\theta < 80^{\circ}$ . In the infrared spectrum of the tellurittes, the strong bands from 890 to 730 cm<sup>-1</sup> could be assigned to the v (M=O) or v (M–O–M) vibrations, where M is zirconium or Hafnium. The peaks in the range of  $650 - 450 \text{ cm}^{-1}$  in the infrared spectrum of the tellurites could be ascribed to one or more of the vibrations of M–O, Te–O, Te–O–M, all of which fall in this range.

Keywords: Hydrithermal synthesis, Zirconium tellurite, Hafnium telluritel

## REFERENCES

Dongrong Xiao, Shutao Wang, Enbo Wang, Yu Hou, Yangguang Li, Changwen Hu, & Lin Xu, D. (2003). Hydrothermal synthesis and crystal structure of a three-dimensional vanadium tellurite  $V_4$ Te<sub>4</sub>O<sub>18</sub>. *Journal of Solid State Chemistry*, 176, 159-164.

Guang-Xi Han, Yong-JuanSong, & Zheng-BoHan. (2009). Hydrothermal synthesis and characterization of two new layered vanadium tellurites  $Cu(TATP)V_2TeO_8$  and  $Cu(DPPZ)V_2Te_2O_{10}$ . *Journal of Solid State Chemistry*, 182, 2202-2207.

Christopher R. Feger, George L. Schimek, & Joseph W. Kolis. (1999). Hydrothermal Synthesis and Characterization of  $M_2Te_3O_8$  (M = Mn, Co, Ni, Cu, Zn): a Series of Compounds with the Spiroffite Structure. *Journal of Solid State Chemistry*, 143, 246-253.

# APPLICATION OF A MATHEMATICAL MODEL FOR MAKING A SMART DECISION FOR IMPROVING SUSTAINABILITY OF COMBINED DAIRY / BIODIESEL SUPPLY CHAIN

## Chief Assit. Prof. Desislava Nikolova, PhD

Department "Material science and technology" Faculty of Technical Sciences University "Prof. d-r Assen Zlatarov" – Burgas Phone+359887678922 E-mail: desislava\_nikolova@btu.bg

#### Eng. Konstantina Galcheva

Faculty of Technical Sciences University "Prof. d-r Assen Zlatarov" – Burgas E-mail: inka\_selena@abv.bg

Abstract: Biodiesel is considered as an inexhaustible, clean consuming substitution on fossil fuel. It is set up from a different feedstock's including dairy waste scum. The development of a mathematical model for making a smart decision for improving sustainability of biodiesel supply chain using dairy waste scum as a feedstock is center on the presented work. The article presents superstructure of a combined dairy/biodiesel supply chain and mathematical model for making smart decision for sustainability. The given task is formulated in the terms of a MILP. The aim of the mathematical model is minimizing the total annual costs. The optimization criterion is defined in terms of economic sustainability, and environmental assessment data are implemented as part of it. The prepositional mathematical model is implemented on an example study from Republic of Bulgaria. The received results may be used as a device\ for intelligent decision-making.

**Keywords:** Biodiesel, Dairy waste scum, Supply chain, Optimal design, Sustainability, Mixed integer linear programming

Acknowledgements: The authors would like to thank Bulgarian National Science Fund for the financial support obtained under contract  $N_{\odot}$  KII-06-H37/5/06.12.19.

## REFERENCES

Babazadeh, R., (2012) a robust stochastic programming approach for agile and responsive logistics under operational and disruption risks, *Int. J. Logist., Syst. Manag.*, 13, 458-482

Dutta, K., (2014) Evolution retrospective for alternative fuels: First to fourth generation. *Renewable energy*, 69, 114-122.

Hombach L., (2016) Optimal design of supply chains for second generation biofuels incorporating European biofuel regulations, *Journal of Cleaner Production*, 133, 565-575

Kavitha, V., (2019) Production of biodiesel from dairy waste scum using eggshell waste, *Process Safety and Environmental Protection*, 125, 279-287

Yatisha et al., (2022) a comprehensive review on dairy waste-scum as a potential feedstock for biodiesel production, *Process Safety and Environmental Protection*, 160, 921-947

# PECULIARITIES OF GRINDING UP ENGOBE SLIPS FOR DECORATING CERAMIC BRICKS

## Assoc. Prof. Olena Khomenko, PhD

Prof. Oleksandr Zaichuk, Doctor of Technology

Department of Chemical Technology of Ceramics, Glass and Building Materials Ukrainian State University of Chemical Engineering, Ukraine E-mail: elenahtks@ukr.net E-mail: zaychuk\_av@ukr.net

## Assoc. Prof. Tsvetan Dimitrov, PhD

Branch Razgrad, University of Ruse "Angel Kanchev", Bulgaria E-mail: tz\_dimitrow@abv.bg

## Student Daryna Filonenko

Department of Chemical Technology of Ceramics, Glass and Building Materials Ukrainian State University of Chemical Engineering, Ukraine E-mail: d.filonenko032001@gmail.com

**Abstract:** This article discusses the features of the preparation of engobe slips to create decorative and protective coatings on the surface of ceramic bricks. Despite the variety of existing compositions of engobe compositions, when grinding most of them, there is a problem of grinding duration, which requires significant energy costs. This problem can be solved using a step-by-step scheme for separate grinding of leaners with the loading of clay components at the second stage. The comparison of the rheological and technological characteristics of engobe slips of the three-component system "refractory clay - quartz sand - cullet" was carried out with joint and separate grinding of lean and clay materials. The optimal characteristics of the main technological parameters have been established, at which the most acceptable indicators of the properties of engobe slips are achieved. The application of engobe suspensions on the surface of dry semi-finished bricks with their further firing at 1050–1100 °C made it possible to obtain coatings with good aesthetic and physical-mechanical properties: water absorption 1.5%-2.6%, mechanical compressive strength 25–28 MPa and frost resistance not less than 50 freeze and thaw cycles.

Keywords: Slip, Engobe, Grinding, Clay, Cullet, Fluidity, Roasting, Sintering, Water Absorption, Frost Resistance

## REFERENCES

Khomenko, O., Datsenko, B., Sribniak, N., Nahornyi, M. & Tsyhanenko, L. (2019) *Development of engobe coatings based on alkaline kaolins*. Eastern-European Journal of Enterprise Technologies, 6(6-102), 49–56.

Dal Bó, M., Bernardin, A. M. & Hotzac, D. (2014) Formulation of ceramic engobes with recycled glass using mixture design. Journal of Cleaner Production. 69, 243-249.

Nandia, V.S., Raupp-Pereira, F., Montedo, O.R.K. & Oliveira, A.P.N. (2015) *The use of ceramic sludge and recycled glass to obtain engobes for manufacturing ceramic tiles*. Journal of Cleaner Production. 86, 461-470.

Yatsenko, N.D. & Rat'kova, É.O. (2009) *Engobes for ceramic brick*. Glass Ceram, 66, 93–94.

# SYNTHESIS AND ANTIMICROBIAL ACTIVITY OF 2-[4-METHYL-4-PHENYL-2,5-BIS(SULFANYLIDENE)IMIDAZOLIDIN-1-YL]-1*H*-BENZO[*DE*]ISOQUINOLINE-1,3(2*H*)-DITHIONE AND ITS METYL DERIVATIVE

## Assoc. Prof. Marin Marinov, PhD

Faculty of Plant Protection and Agroecology, Department of Chemistry and Phytopharmacy, Agricultural University – Plovdiv E-mail: m\_n\_marinov@abv.bg

## Assoc. Prof. Iliana Kostova, PhD

Chief Assist. Prof. Iliana Nikolova, PhD

Department of Chemical, Food and Biotechnologies, "Angel Kanchev" University of Ruse, Razgrad Branch E-mail: ikostova@uni-ruse.bg E-mail: inikolova@uni-ruse.bg

## Prof. Neyko Stoyanov, PhD

Department of Chemical, Food and Biotechnologies, "Angel Kanchev" University of Ruse, Razgrad Branch E-mail: nstoianov@uni-ruse.bg

**Abstract:** This paper shows the interaction of 1,8-naphthalic anhydride with 5-methyl-5-phenyl- and 5-methyl-5-tolylhydantoins, where the derivatives can be DNA targeting, anticancer and cell imaging agents in one rapidly developing medicine field.

Keywords: 1,3-phenalenediones, isoquinolines, hydantoins, antimicrobial activity

# MULLITE CERAMIC PIGMENTS OBTAINED FROM BIOWASTE - RICE HUSK

## Chef Assistant Fila Yovkova, PhD

Eng. Mariela Minova , PhD student Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: fila\_03@abv.bg E-mail: minova\_m@abv.bg

## Assoc. Prof. Tsvetan Dimitrov, PhD

Department of Chemical, Food and Biotechnology "Angel Kanchev" University of Ruse – Razgrad Branch E-mail:tzdimitrov@uni-ruse.bg

## Assoc.Prof. Adriana Georgieva, Phd

Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: adriana\_georgieva79@yahoo.com

**Abstract:** One of the relatively newest and promising ceramic pigments are those obtained on the basis of the mineral mullite  $(Al_2O_3.2SiO_2)$ , in the crystal lattice of which colored chromophore ions are incorporated. In addition to high colouring ability, these pigments have high temperature stability, insolubility in silicate melts and high reflectivity. The aim of the present work is to synthesize mullite pigments from waste raw materials (rice husk ash), colored with five chromophore elements, Cr, Fe, Co, Cu, Ni, by solid-phase synthesis method and to characterize their properties. Biowaste - rice husk burned at  $650^{\circ}$ C was used as a source of SiO<sub>2</sub>. The synthesized materials were investigated mainly by X-ray phase analysis and spectrophotometric color measurement using a Lovibond Tintometer RT 100 Color.

Keywords: mullite ceramic pigments, , rice husk, colored chromophore ions

# CERAMIC PIGMENTS BASED ON THE MINERAL MULLITE /3AL<sub>2</sub>O<sub>3</sub>.2SIO<sub>2</sub>/

## Chef Assistant Fila Yovkova, PhD

Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: fila\_03@abv.bg

Assoc. Prof. Tsvetan Dimitrov, PhD Department of Chemical, Food and Biotechnology "Angel Kanchev" University of Ruse – Razgrad Branch E – mail:tzdimitrov@uni-ruse.bg

## Assoc.Prof. Adriana Georgieva, Phd

Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: adriana\_georgieva79@yahoo.com

## Eng. Mariela Minova, PhD student

Department of Chemical Technology, Prof. Dr. Assen Zlatarov University Bourgas E-mail: minova\_m@abv.bg

**Abstract:** Mullite  $(Al_2O_3.2SiO_2)$  is a mineral derived from aluminosilicates at high temperatures. This type of mineral is mainly obtained artificially and it is a high-quality refractory and ceramics raw material. The aim of the present work is to synthesize ceramic pigments based on the mineral mullite by solid-phase spinning method by introducing Co, Ni, Cu, Fe and Cr as chromophoric elements using chemically pure raw materials. SiO2.nH2O was used as the source of SiO2. The synthesized materials were investigated mainly by X-ray phase analysis and spectrophotometric color measurement using a Lovibond Tintometer RT 100 Color.

*The influence of the coloring ions on the formation of the parent mineral was also investigated. Keywords: mullite, ceramic pigments, solid-phase syntering, chromophore elements, color characteristics.* 

# ACIDITY ADJUSTMENT OF THE SOLUTIONS FOR COATING DEPOSITION AND FURTHER SEALING BY LOURIER BUFFERS

## Stefania Portolesi, Erasmus MS-student

University of Calabria (Italy) E-mail: stefania.portolesi@live

## Dr. Stephan Kozhukharov, PhD, dipl. Eng.

Department of Physics University of Chemical Technology and Metallurgy – Sofia E-mail: s.kozhukharov@uctm.edu

## Assoc. Prof. Temenuzhka Haralanova, PhD

Department of Chemistry, Food and Biotechnologies University of Ruse "Angel Kanchev", Razgrad Branch E-mail: tharalanova@uni-ruse.bg

## Assoc. Prof. Dr. Christian Girginov, PhD, dipl. Eng.

Department of Physical Chemistry University of Chemical Technology and Metallurgy – Sofia E-mail: girginov@uctm.edu

**Abstract:** The present paper provides valuable practical information on the preparation of buffer solutions in accordance with data presented in the encyclopedic handbook of Y.Y. Lourier. Among the wide variety of buffer solutions proposed by the author, only phosphate and borate are discussed here. The main reason for the interest in these types of buffers is that phosphating is a common procedure for sealing various primers for corrosion protection, while Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> and H<sub>3</sub>BO<sub>3</sub> are usually preferred electrolyte additives for electrochemical film deposition. for the reader's convenience, pH-composition tables are presented. The data in these tables enable preparation of suitable buffers for various coatings and other technological purposes.

Keywords: pH buffers, Buffer compositions, Electrochemical deposition electroytes, phosphatation solutions.

Acknowledgements: The authors are grateful for the financial support from BNSF (contract KII06-H37/16/2019). The support from INFRAMAT (contract Д01-306/2021) is also acknowledged.

## REFERENCES

Heller D. K., Fahrenholtz W. G., O'Keefe M. J., (2010). The effect of post-treatment time and temperature on cerium-based conversion coatings on Al 2024-T3, *Corrosion Science* 52, 360 – 368.

Koreman I. M., (1949). Quatnitative Microchemical analysis. *Gov. Ed. Sci. Tech. Chem. Lit.* (Moscow). 143-166; UDC. K-66-543-15-5-2

Lourier Y. Y., (1979). Manual of Analytical Chemistry, *Gov. ed. "Chemistry"* (Moscow) 305 - 309; UDC 543-031.

Mansfeld F., Wang Y., Development of "stainless" aluminum alloys by surface modification, Materials Science and Engineering A-198, 1-2, (1995) 51 – 61,

Pinc W., Geng S., O'Keefe M., Fahrenholtz W., O'Keefe T., (2009). Effects of acid and alkaline based surface preparations on spray deposited cerium-based conversion coatings on Al 2024-T3. Applied Surface Science 255, 4061 – 4065.

# DIOPSIDE CERAMIC PIGMENTS OBTAINED BY A SOL-GEL METHOD WITH THE PARTICIPATION OF DIFFERENT CHROMOPHORE ELEMENTS

## Assos. Prof. Tsvetan Dimitrov, PhD

Department of Chemistry, Food and Biotechnologies University of Rousse "Angel Kanchev "- Razgrad Branch E-mail: tz\_dimitrow@abv.bg

## Assoc. Prof. Rositsa Titorenkova, PhD

Institute of mineralogy and crystallography Bulgarian Academy of Sciences E-mail: rositsatitorenkova@gmail.com

## **Ognyan Petrov, PhD**

Institute of mineralogy and crystallography Bulgarian Academy of Sciences E-mail: opetrov52@gmail.com

**Abstract:** The sol-gel method is used for the synthesis of diopside  $(CaMgSi_2O_6)$  ceramic pigments doped with cobalt, iron, nickel and manganese ions. Pure grade raw materials such as TEOS - Si $(OC_2H_5)_4$  and nitrates of  $Ca^{2+}$ ,  $Mg^{2+}$ ,  $Co^{2+}$ ,  $Fe^{2+}$ ,  $Cr^{3+}$  and  $Mn^{2+}$  have been used for the synthesis. The aim of this study was to obtain isomorphic substituted diopside based ceramic pigments. Series of ceramics in the system  $CaO.MgO.MeO.2SiO_2$  ( $Me=Co^{2+}$ ,  $Fe^{2+}$ ,  $Cr^{3+}$ ,  $Mn^{2+}$ ) were synthesized via sol-gel method and sintering at 800, 900, 1000, 1100 and 1200°C. The resulting ceramics were studied by powder X-ray diffraction, infrared, UV-Vis spectroscopy, electron microscopy, electron paramagnetic resonance. The ceramics obtained by sol-gel method mainly contain diopside, which crystallizes even at 800°C. The small amounts of additional phases depend on the type of metal ion and the sintering temperature. The phase composition and the color coordinates of the obtained ceramics were determined. The best pigments have been added to the white earthenware glaze and tested as a sanitary ware pigment.

Keywords: diopside pigments, sol-gel, CIELab color measurement

## FRI-LCR-P-2-BFT(R)-01

# STARCH – MICROSTRUCTURE, TEXTURAL AND THERMAL PROPERTIES

## PhD student Pavlina Doykina

Assoc. prof. Aneta Popova, PhD) Department of Catering and nutrition University of food technologies, Plovdiv, Bulgaria E-mail: pavlina\_doikina@abv.bg E-mail: popova\_aneta@yahoo.com

Assoc. prof. Zhivka Goranova, PhD) Institute of Food Preservation and Quality, Plovdiv, Bulgaria E-mail: jivka\_goranova@abv.bg

**Abstract**: The present study focuses on the investigation of rice, corn and wheat starches. The size of the granules for each type of starch, as well as the changes characteristic for the gellatinisation process at different temperature regimes, were established. The swelling capacity, solubility, water-holding capacity, and syneresis were also determined. The textural properties of the starch gels were characterized by their firmness, gumminess, adhesiveness, springiness, and cohesiveness. It was found that the wheat starch had the highest solubility, and the corn starch has the lowest % of syneresis.

Keywords: rice, corn, whaet, gellatinisation, syneresis

# BIOGAS PRODUCTION IN A SYSTEM OF CASCADE ANAEROBIC DIGESTERS

## **Ivan Konstantinov Angelov**

Institute of Chemical Engineering, Bulgarian Academy of Sciences, Bulgaria E-mail: i\_angelov@iche.bas.bg

## Prof. Venko Nikolaev Beschkov

Institute of Chemical Engineering, Bulgarian Academy of Sciences, Bulgaria E-mail: vbeschkov@yahoo.com

Abstract: The paper reviews the use of a system of cascade connected digesters, in order to produce biogas. During the experiments, different mixtures are used as feeding material to the digesters. The aim is to investigate the influence of such cascade system and its potential to produce biogas. It's believed that such system could be built at middle and low scale farming places, so that organic waste like straw and manure could be collected and utilized into the digesters. The experiment consists of two main parts: part one is the construction of digesters cascade system, and part two is loading the feeding material into the digester. The digester is connected to each other, allowing feeding material to be transferred from one digester to another. Then each digester is connected with biogas holder, in which biogas is collected. The temperature control in each digester is achieved by a system of heated and thermally insulated pipelines running around the reactors and connected to boiler. The digesters are also thermally insulated. The temperature is set at 35 ° C. Samples were taken daily for analysis.

The process of mixing plant waste material with cattle manure is believed to improve the process of anaerobic digestion and results in higher yield of biogas with higher methane content.

Keywords: Biogas, cascade digesters, waste plant material, methane content, cattle manure

Acknowledgement. The research is supported by BNSF under project KII-06-H27/4/2018.

# CO2 RECYCLING WITH PRODUCTION OF ORGANIC CHEMICALS BY ELECTROLYSIS

## Ivanka Mihova Dimova

Institute of Chemical Engineering, Sofia Bulgarian Academy of Sciences, Bulgaria E-mail: ivkhris@abv.bg

**Prof. Venko Nikolaev Beschkov** Institute of Chemical Engineering, Sofia Bulgarian Academy of Sciences, Bulgaria E-mail: vbeschkov@gmail.com

## Prof. Ljutskan Ljutskanov

Institute of Chemical Engineering, Sofia Bulgarian Academy of Sciences, Bulgaria E-mail:ljutzkanov@ice.bas.bg

**Abstract:** The research is focused in the electrochemical reduction of bicarbonate and carbonate anions to organic compounds. Graphite rods are used as electrodes, in which the cathode is modified with activated carbon doped with metal oxides (staneoxide, titanium tetraoxide and magnetite). Results show significant amount of formic acid, as well as presence of methanol, some amounts of aliphatic carbohydrates, olefins and aromatic compounds.

The successful results from the research carried out, could be an opportunity to recycle carbon dioxide into usefull organic products after absorption in alkaline solutions and subsequent catalyzed electrolysis.

Keywords: electrochemical reduction, carbonates, bicarbonates, graphite electrodes, oxide catalysts

Acknowledgement. The research is supported by BNSF under project KII-06-H27/4/2018.

# POSSIBILITIES TO IMPROVING THE CALCIUM CONTENT IN WHEAT BREAD

## Chief Assist. Dana Stefanova, PhD

Department of Commodity Science University of Economics - Varna E-mail: d.stefanova@ue-varna.bg

Assoc. Prof. Denka Zlateva, PhD Department of Commodity Science Univesity of Economics - Varna E-mail: zlateva@ue-varna.bg

Abstract: At the present stage, it is necessary to encourage and increase the intake of foods that have a positive impact on human health. An appropriate way to ensure a healthy diet is to include natural products that are rich in biologically active substances, incl. mineral elements. Bulgaria is a country with a traditionally high consumption of wheat bread, but it is relatively poor in minerals. This has directed our interest to the possibility of enriching wheat bread with non-traditional raw materials for bread production - rosehip flour, pumpkin seed flour and nettle flour. The calcium content in wheat bread samples, prepared with the addition of 5% and 10% of the specified flours, was investigated using the highly sensitive AES-ICP method. from the obtained results, it was found that the calcium content of the fortified samples varies from 138 mg/kg (5% pumpkin seed flour) to 2872 mg/kg (10% nettle flour). This amount is significantly higher than that found in bread, made only from wheat flour type 500, where it is 108 mg/kg. Enriching wheat bread with these type of flours makes it possible to increase calcium intake. with the addition of 10% nettle flour, more than 70% of the body's daily calcium needs would be met for both men and women, which is 10 times higher than in the control sample. This is an appropriate nutritional approach for the prevention of deficiency conditions. Keywords: Calcium, Mineral content, Wheat flour, Pumpkin seed flour, Rosehip flour, Nettle flour

# INVESTIGATION OF ACTIVE PAPER PACKAGING MATERIALS WITH SILVER WATER

## Assoc. Prof. Iliana Kostova, PhD

Department of Biotechnology and Food Technology, Razgrad Branch, "Angel Kanchev" Univesity of Ruse E-mail: ikostova@uni-ruse.bg

**Eng. Darina Georgieva** Department of Biotechnology and Food Technology, Razgrad Branch, "Angel Kanchev" Univesity of Ruse E-mail: ddarina0412@gmail.com

## Prof. Stanka Damyanova, DcS

Department of Biotechnology and Food Technology, Razgrad Branch, "Angel Kanchev" University of Ruse E-mail: sdamianova@uni-ruse.bg

**Abstract:** Paper-based packaging materials with silver water coating were developed. their antimicrobial activity against Gram-positive, Gram-negative bacteria, yeasts and molds was investigated. It has been established that the tested packaging materials have a significant antibacterial and less fungicidal effect.

Keywords: Paper packaging, Silver ions, Antimicrobial activity

## REFERENCES

Rutkaite R., Radusin T., Suminska P., Marcos B., & Coma V. (2018) Active Packaging Applications for Food. *Comprehensive Reviews in Food Science and Food Safety*, 17, 165 – 199

Bumbudsanpharoke, N., Choi, J. & Ko, S. (2015). Applications of nanomaterials in food packaging. Journal of Nanoscience and Nanotechnology, 15(9), 6357 – 6372

Ibrahim S., El Saied H., Hasanin M., (2019), Active paper packaging material based on antimicrobial conjugated nano-polymer/amino acid as edible coating, *Journal of King Saud University* – *Science*, 31, pp.1095 – 1102.

Rakchoy S, Suppakul P., Jiankarn T., (2009). Antimicrobial effects of vanillin coated solution for coating paperboard intended for packaging bakery products. *As. J. Food Ag-Ind.* 2, 138 – 147

## **DEVELOPMENT OF FUNCTIONAL FOODS FOR TYPE 2 DIABETES**

## Elena Sergheeva, MS student

Department of Food Technology Technical University of Moldova, Moldova E-mail: elena.sergheeva1@tpa.utm.md

Assist. Prof. Mihaela Geicu-Cristea, PhD Prof. Florentina Matei, PhD Prof. Mona Elena Popa, PhD Asist. Prof. Elisabeta Elena Popa, PhD Faculty of Biotechnology University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania E-mail: mihaela.geicu@usamv.ro E-mail: florentina.matei@biotehnologii.usamv.ro E-mail: monapopa@agral.usamv.ro E-mail: elena.eli.tanase@gmail.com

Ecaterina Robu, MS student Assoc. Prof. Cristina Popovici, PhD Department of Food Technology Technical University of Moldova, Moldova E-mail: ecaterina.robu1@tpa.utm.md E-mail: cristina.popovici@toap.utm.md

Abstract: Type 2 diabetes is a rapidly developing disease, the prevention of which includes the consumption of specialized functional foods. In this regard, the aim of this study is the development of functional food products with a hypoglycemic properties: a marmalade-like food product and mousse with the replacement of sugar in the recipe with stevia extract and with a mixture of stevia extract and inulin. The raw materials selected for the products development include apples "Golden", mint, various gelling agents (gelatin and agar-agar), etc. to obtain optimal compositions of the developed food products, combinations of various types of raw materials and their countity were experimentally determined. As a result of the research, the recipe was optimized and a technology for producing marmalade and mousse with hypoglycemic properties was developed. The research included the study of the physical, chemical and sencory properties of the developed food products. The content of the simple carbohydrates determined by the refractometric method showed that products with the addition of stevia extract contain 26-28% less sugars than the reference sample, and the water activity (aW) is 0.97, which is higher then in the reference sample. It was also determined that in order to obtain optimal technological and sensory properties, the mass of mint added to the composition of the developed products should be 1.3% of the mass of apple puree, and the mass of stevia extract should be 0.4%, respectively. The mass of inulin should be 3% of the mass of puree, mass of gelatin 2.1% and agar-agar 1.7%. The obtained experimental data showed that the developed food products have the claimed properties and improved technological and sensory properties and can be recommended for use by people with type 2 diabetes, as well as for the prevention of the disease.

Keywords: Functional Foods, New Product Development, Type 2 Diabetes

**Aknowlegments**: The authors acknowledge the funding and networking activities carried out within the EU funded Erasmus+ Credit Mobility Project No. 2019-1-RO01-KA107-061509, coordinated by the University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania.

## REFERENCES

E. Sergheeva, M. Geicu-Cristea, F. Matei, M.E. Popa, E.E. Popa, E. Robu, C. Popovici (2022). *Consumer perceptions of functional foods for type 2 diabetes in Romania and Republic of* 

*Moldova.* Book of abstracts of International Conference "New Trends on Sensing-Monitoring-Telediagnosis for Life Sciences", September 8-10, 2022, Braşov, Romania, p. 66.

N. Forouhi, A. Misra, V. Mohan, R. Taylor (2018). *Dietary and nutritional approaches for prevention and management of type 2 diabetes*. United Kingdom.

A. Alkhatib, C. Tsang, A. Tiss, T. Bahorun, H. Arefanian, R. Barake, A. Khadir, J. Tuomilehto (2017). *Functional Foods and Lifestyle Approaches for Diabetes Prevention and Management*. Saudi Arabia.

## DEVELOPMENT OF FOODS WITH ANTIOXIDANT AND ANTICANCER POTENTIAL

Ecaterina Robu, MS student Elena Sergheeva, MS student Assoc. Prof. Cristina Popovici, PhD Department of Food Technology Technical University of Moldova, Moldova E-mail: ecaterina.robu1@tpa.utm.md E-mail: cristina.popovici@toap.utm.md

Abstract: Malignant tumors have become one of the main causes of mortality in the world, people who are faced with a diagnosis of "cancer" especially need proper nutrition. Due to insufficient intake of essential nutrients, a person's condition may worsen, with the subsequent development of the disease. The aim of the work was to develop oatmeal bars with berry marmalade layers, which have antioxidant and anticancer properties. As raw materials, products of autochthonous origin were used: sea buckthorn, black currant, pink grapes, honey, sunflower seeds, walnuts, pumpkin seeds, etc. Research methods included the technological development of recipes for bars to obtain the most harmonious combination of all components used. The analysis of the studied samples of berry juices with the free radical DPPH-and the analysis of UV spectra of the studied samples, amounting to 92.52% and 90.45%, respectively. The analysis of UV spectra confirmed the content of such antioxidant components as polyphenolic compounds characteristic for all studied samples and registered at a wavelength of the 220 nm. for the sea buckthorn sample, a second peak was recorded at the wavelength of 350 nm, characteristic for antioxidant components such as carotenoides. The results of the sencory evaluation showed that the bar with sea buckthorn marmalade layer had the most pleasant sensory properties. Based on all the results obtained, it can be concluded that the developed food products can be recommended for consumption by consumers.

Keywords: functional food, antioxidant and anticancer potential, technological process, food development.

#### REFERENCES

E. Robu, E. Sergheeva, C. Popovici. *Consumer perceptions of functional foods with antioxidant and anticancer potential*. Book of abstracts of International Conference "New Trends on Sensing-Monitoring-Telediagnosis for Life Sciences", September 8-10, 2022, Braşov, Romania, 63 p.

S.S. Tasdemi, S. Sehadet, N. SANLIER. An insight into the anticancer effects of fermented foods: a review. Journal of Functional Foods, UK, 2020. p 8.

T. Siddhita, H. MD Sadique. *Functional foods for prevention and treatment of cancer*. Research Letter, 2021. p. 10.

# **CHAIR & AUTHOR INDEX**

## **Chair Index**

NAME	SESSION
Ana Popova	FRI-1.322-1-SW
Anton Nedyalkov	FRI-2B.412-1-EM1
Atanas Atanasov	FRI-8.303b-1-AMT&ASVM
Bagryana Ilieva	FRI-2G.405-PP
Denitsa Trancheva	FRI-2G.309-1-MCDA
Diana Antonova	FRI-2G.204FS
Dimitar Grozev	FRI-20.25-2-SITSTL
Elitsa Kumanova	FRI-2B.313-1-L; FRI-2B.313-2-L
Emilia Velikova	FRI-2.116-ERI
Evgenia Goranova	FRI-216-1-ITS(S); FRI-216-2-ITS(S)
Galina Lecheva	FRI-239-1- PPM(S); FRI-229-2-PPM(S)
Gencho Popov	FRI-9.2-1-THPE
Georgi Hristov	FRI-2G.302-1-CCT2; FRI-2G.302-2-CCT2
Iliana Kostova	FRI-LCR-1-BFT(R)
Ivan Beloev	FRI-20.25-1-SITSTL
Ivanichka Serbezova	FRI-K1-1-QHE
Ivelin Ivanov	FRI-1.317-1-MEMBT
Milen Ivanov	FRI-2B.312-1-NS
Mimi Kornazheva	FRI-2G.510-1-ESIS2
Mitko Nikolov	FRI-1.202-1-MR
Nadezhda Evstatieva	FRI-10.326-1-EEEA; FRI-10.326-2-EEEA
Petya Stefanova	FRI-2G.307-AS
Plamen Manev	FRI-19.206-1-EC
Rosen Ivanov	FRI-2.206-1-TMS; FRI-2.206-2-TMS
Stanka Damyanova	FRI-LCR-P-2-BFT(R)
Stefka Mindova	FRI-2K.201-1-HP
Svilen Kunev	FRI-2G.404-1-EM2
Temenuzhka Haralanova	FRI-LCR-1-CT(R)
Todorrka Georgieva	FRI-110-1-PP(S); FRI-110-2-PP(S)
Tsveta Hristova	FRI-2G.104-1-HC
Tsvetan Dimitrov	FRI-LCR-KS®; FRI-LCR-P-2-CT®
Tsvetomir Vasile	FRI-1.414-MIP
Tsvetozar Georgiev	FRI-2G.303-1-CCT1
Velislava Doneva	FRI-2G.403-LL
Vladimir Chukov	FRI-2G.510-1-ESIS1
Yordan Doychinov	FRI-16.203-1-ID

## **Author Index**

NAME	SESSION
A. Ivanova-Vasileva	FRI-10.326-1-EEEA
A. K. Atyhanov	FRI-10.326-1-EEEA
Adriana Borodzhieva	FRI-2G.302-1-CCT2
Adriana Georgieva	FRI-LCR-1-CT(R); FRI-LCR-P-2-CT(R)
Adriana Gigova	FRI-216-1-ITS(S); FRI-LCR-P-2-CT(R)
Ahmed Ahmedov	FRI-2K.201-1-HP
Albena Stoyanova	FRI-LCR-1-BFT(R)
Aleksandar Georgiev	FRI-25.25-1-SITSTL
Aleksandar Kosuliev	FRI-2G.404-1-EM2
Aleksander Andreev	FRI-10.326-2-EEEA
Aleksandra Klimenko	FRI-1.414-MIP
Altsek Naydenov	FRI-2K.201-1-HP
Amjed Kraiem	FRI-10.326-2-EEEA
Ana Ivanova	FRI-2K.201-1-HP
Ana Popova	FRI-1.322-1-SW
Anastas Georgiev	FRI-2B.313-1-L
Aneliya Ivanova	FRI-2G.303-1-CCT1
Aneliya Manukova	FRI-10.326-2-EEEA
Aneliya Tosheva	FRI-2.116-ERI
Aneta Popova	FRI-LCR-P-2-BFT(R)
Angel Dyndikov	FRI-2.206-1-TMS
Anka Krasteva	FRI-10.326-2-EEEA
Anna Lecheva	FRI-2.116-ERI
Anna Nikolova	FRI-2B.313-2-L
Antoaneta Dobreva	FRI-2.206-1-TMS
Antoaneta Mihova	FRI-2.116-ERI
Anton Vinkov	FRI-2G.309-1-MCDA
Antonina Mihaylova	FRI-10.326-1-EEEA
Asen Asenov	FRI-25.25-1-SITSTL
Asya Veleva	FRI-2G.405-PP
Atanas Iliev	FRI-2.206-2-TMS
Atanas Stavrov	FRI-2G.309-2-MCDA
B. N. Bekaidarova	FRI-10.326-1-EEEA
Bagryana Ilieva	FRI-2G.405-PP
Belma Gaazi	FRI-10.326-2-EEEA
Bilyana Ivanova	FRI-2B.313-2-L
Boian Valentinov	FRI-2K.201-1-HP
Boris Evstatiev	FRI-10.326-1-EEEA
Borislav Valchev	FRI-1.202-1-MR
Boryana Georgieva	FRI-16.203-1-ID
Bozhana Stoycheva	FRI-2G.404-1-EM2
Bozhidar Kolev	FRI-8.303b-1-AMT&ASVM
Chavdar Rumenin	FRI-2G.204FS
Christian Girginov	FRI-LCR-P-2-CT(R)

Claudia Herrera Quintero	FRI-10.326-2-EEEA
Costea Alina	FRI-110-1-PP(S)
Cristina Popovici	FRI-LCR-P-2-BFT(R)
Cristina-Valentina Dafinoiu	FRI-110-1-PP(S)
Cvetomir Konov	FRI-16.203-1-ID
Cvetomir Lukanov	FRI-10.326-1-EEEA
Dalibor Barta	FRI-2.206-1-TMS
Dana Stefanova	FRI-LCR-P-2-BFT(R)
Danail Gospodinov	FRI-1.317-1-MEMBT
Danel Leekassa Bekana	FRI-1.202-1-MR
Daniel Lyubenov	FRI-25.25-2-SITSTL
Daniel Pavlov	FRI-2G.404-1-EM2; FRI-LCR-KS(R)
Daniela Ilieva	FRI-2B.412-1-EM1
Daniela Konstantinova	FRI-2G.104-1-HC
Daniela Lyutakova	FRI-2G.104-1-HC
Daniela Yordanova	FRI-1.322-1-SW; FRI-2B.412-1-EM1
Darina Georgieva	FRI-LCR-P-2-BFT(R)
Daryna Filonenko	FRI-LCR-P-2-CT(R)
Denislav Stoicov	FRI-2K.201-1-HP
Denitsa Fileva	FRI-2G.404-1-EM2
Denitsa Petrova	FRI-2B.313-2-L
Denitsa Trancheva	FRI-2G.309-1-MCDA
Denitsa Vasileva	FRI-2K.201-1-HP
Denka Zlateva	FRI-LCR-P-2-BFT(R)
Desislav Gechev Ivanov	FRI-16.203-1-ID
Desislava Georgieva	FRI-2.116-ERI
Desislava Nikolova	FRI-9.2-1-THPE; FRI-LCR-P-2-CT(R)
Desislava Vasileva Stoyanova	FRI-2G.405-PP
Despina Georgieva	FRI-2G.104-1-HC
Diana Antonova	FRI-1.322-1-SW
Diana Bebenova-Nikolova	FRI-239-2- PPM(S)
Diana Nikolaeva	FRI-2.206-1-TMS
Diana Zhelezova	FRI-239-1-PPM(S)
Diana Zhelezova-Mindizova	FRI-239-2- PPM(S)
Dilyan Ferdinandov	FRI-2G.204FS
Dilyana Kalinova	FRI-2B.313-1-L
Dima Spasova	FRI-2G.405-PP
Dimitar Dimitrov	FRI-1.317-1-MEMBT
Dimitar Eskidarov	FRI-25.25-2-SITSTL
Dimitar Grozev	FRI-25.25-2-SITSTL
Dimitar Kehayov	FRI-8.303b-1-AMT&ASVM
Dimitar Marinov	FRI-2G.302-2-CCT2
Dimitar Obretenov	FRI-2.206-2-TMS
Dimitar Rosenov Chaparov	FRI-2.116-ERI
Dimitar Trifonov	FRI-10.326-1-EEEA
Dimiter 'Martin' Genovski	FRI-2G.307-AS
Dimityr Stefanin	FRI-25.25-1-SITSTL

Dirk Wagener	FRI-2G.204FS
Diyana Kinaneva	FRI-2G.302-1-CCT2
Doaga Florin-Adrian	FRI-10.326-2-EEEA
Dobri Stoyanov	FRI-2G.302-2-CCT2
Dobrin Vassilev	FRI-2G.309-2-MCDA
Donka Ilieva	FRI-110-2-PP(S)
Donka Ivanova	FRI-10.326-2-EEEA
Dora Marinova	FRI-2G.309-2-MCDA
Doroteya M. Dimova-Severinova	FRI-2B.313-1-L
Dragomir Mitev	FRI-2G.405-PP
Durhan Saliev	FRI-25.25-1-SITSTL
Dzhamal Uzun	FRI-216-1-ITS(S); FRI-LCR-P-2-CT(R)
Ecaterina Robu	FRI-LCR-P-2-BFT(R)
Edita Tharomskiene	FRI-2.116-ERI
Ekaterina Ivanova	FRI-2G.405-PP
Elena Sergheeva	FRI-LCR-P-2-BFT(R)
Elena Trencheva	FRI-2G.307-AS
Elena Zheleva	FRI-2G.309-1-MCDA
Elina Marinova	FRI-2B.313-1-L
Elisabeta Elena Popa	FRI-LCR-P-2-BFT(R)
Elisabetta De Juliis	FRI-2K.201-1-HP
Elitsa Ibryamova	FRI-2G.303-1-CCT1
Elitsa Kumanova	FRI-2B.312-1-NS; FRI-2B.313-1-L; FRI-K1-1-QHE
Elizar Stanev	FRI-2G.404-1-EM2
Emanuil Kolarov	FRI-2B.313-1-L
Emil Mitev	FRI-2.206-2-TMS
Emil Yankov	FRI-1.317-1-MEMBT; FRI-19.206-1-EC
Emilia Dimitrova	FRI-1.322-1-SW
Emilia Golemanova	FRI-2G.303-1-CCT1
Emilia Nedkova	FRI-2G.403-LL
Emiliya Velikova	FRI-2.116-ERI
Esin Veysalova-Miteva	FRI-2G.510-1-ESIS2
Eva Parvanova	FRI-2G.510-1-ESIS1
Evelina Cankova	FRI-2.116-ERI
Evelina Kopcheva	FRI-2G.405-PP
Evgenia Goranova	FRI-216-1-ITS(S)
Evgeniy Ganev	FRI-LCR-P-2-CT(R)
Evgeniya Bratoeva	FRI-1.322-1-SW
Evgeniya Zhekova	FRI-8.303b-1-AMT&ASVM
Evlogi Mladenov	FRI-1.317-1-MEMBT
Fatima Rahim Abdul Hussein	FRI-2G.405-PP
Fatme Minkova	FRI-K1-1-QHE
Fila Yovkova	FRI-LCR-1-CT(R); FRI-LCR-P-2-CT(R)
Firat Sarsar	FRI-K1-1-QHE
Florentina Matei	FRI-LCR-P-2-BFT(R)
Gabriela Peneva	FRI-2B.412-1-EM1

Galena Stefanova	FRI-2B.313-1-L
Galina Dyakova	FRI-8.303b-1-AMT&ASVM
Galina Ivanova	FRI-2G.303-1-CCT1
Galina Lecheva	FRI-239-1-PPM(S); FRI-239-2- PPM(S)
Galina Stoyanova	FRI-2B.412-1-EM1
Galya Georgieva-Tsaneva	FRI-K1-1-QHE
Ganka Ivanova	FRI-2B.313-1-L
Georgi Georgiev	FRI-2G.302-1-CCT2; FRI-2G.302-2-CCT2
Georgi Hristov	FRI-2G.302-1-CCT2; FRI-2G.302-2-CCT2
Georgi Kadikyanov	FRI-2.206-1-TMS
Georgi Krastev	FRI-2G.303-1-CCT1
Georgi Mladenov	FRI-25.25-1-SITSTL
Georgi Rusev	FRI-LCR-P-2-CT(R)
Georgi Stefanov	FRI-2B.313-1-L
Georgi V. Georgiev	FRI-2B.412-1-EM1
Georgy Atanasov	THUR-110-1-KS(S)
Gergana Staneva	FRI-2.206-1-TMS
Greta Koleva	FRI-2G.104-1-HC
Halyna Dubova	FRI-LCR-1-BFT(R)
Hristina Sokolova	FRI-2G.404-1-EM2
Hristo Angelov	FRI-2B.313-2-L
Hristo Georgiev	FRI-2G.309-2-MCDA
Igor Sheludko	FRI-2B.412-1-EM1
Iliana Kostova	FRI-LCR-P-2-BFT(R); FRI-LCR-P-2-CT(R)
Iliana Nikolova	FRI-LCR-1-BFT(R); FRI-LCR-P-2-CT(R)
Ilina Ivanova	FRI-2.116-ERI
Iliyan Bojkov	FRI-8.303b-1-AMT&ASVM
Iliyan Damyanov	FRI-25.25-1-SITSTL
Iliyan Danev	FRI-1.317-1-MEMBT
Iliyana Georgieva	FRI-2.116-ERI
Iliyana Minkovska	FRI-2.206-1-TMS
Ion Mierlus-Mazilu	FRI-2.116-ERI
Irena Markovska	FRI-LCR-KS(R)
Irena Valova	FRI-2G.303-1-CCT1
Irina Karaganova	FRI-2K.201-1-HP
Irina Kostadinova	FRI-1.322-1-SW
Irina Minkova	FRI-19.206-1-EC
Irinka Hristova	FRI-2G.104-1-HC
Iryna Levchuk	FRI-LCR-1-BFT(R)
Iskra Ilieva	FRI-2G.405-PP
Ivailo Nikolaev	FRI-9.2-1-THPE
Ivan Angelov	FRI-LCR-P-2-BFT(R)
Ivan Beloev	FRI-25.25-2-SITSTL
Ivan Evtimov	FRI-2.206-1-TMS; FRI-2.206-2-TMS
Ivan Iliev	FRI-110-1-PP(S)
Ivan Ivanov	FRI-216-1-ITS(S)
Ivan Ivanov	FRI-1.202-1-MR

Ivan Kolev	FRI-2G.302-2-CCT2
Ivan Omayski	FRI-2.206-2-TMS
Ivan Petrov	FRI-9.2-1-THPE
Ivan Zahariev	FRI-8.303b-1-AMT&ASVM
Ivanichka Serbezova	FRI-2G.104-1-HC; FRI-K1-1-QHE
Ivanka Dimova	FRI-LCR-P-2-BFT(R)
Ivanka Zheleva	FRI-19.206-1-EC
Ivaylo Borisov	FRI-2.206-2-TMS
Ivelin Iliev	FRI-110-2-PP(S)
Ivelin Ivanov	FRI-1.317-1-MEMBT
Ivelin Penkov	FRI-2G.302-1-CCT2
Ivelin Velchev	FRI-2B.313-1-L
Ivelin Yotsov	FRI-2G.309-2-MCDA
Ivelina Balabanova	FRI-2G.302-1-CCT2
Ivelina Stefanova	FRI-2K.201-1-HP
Ivelina Tsacheva	FRI-216-1-ITS(S); FRI-LCR-P-2-CT(R)
Ivelyna Vatova	FRI-1.322-1-SW; FRI-2G.404-1-EM2
Ivo Draganov	FRI-1.317-1-MEMBT
Joana Pozharashka	FRI-2G.309-1-MCDA
Jorjeta Kraleva	FRI-2.116-ERI
Julia Chaparova	FRI-2.116-ERI
Julia Doncheva	FRI-2G.405-PP
K. Panayotova	FRI-LCR-1-CT(R)
Kalcho Petkov	FRI-25.25-2-SITSTL
Kaloyan Nikolaev	FRI-1.202-1-MR
Kaloyan Stoyanov	FRI-K1-1-QHE
Kamelia Assenova	FRI-2B.412-1-EM1; FRI-2G.404-1-EM2
Kamen Rikev	FRI-2G.403-LL
Kamen Uzunov	FRI-16.203-1-ID
Katerina Gabrovska-Evstatieva	FRI-10.326-1-EEEA
Kathryn Cormican	FRI-K1-1-QHE
Kina Velcheva	FRI-2G.104-1-HC
Kiril Hadjiev	FRI-2.206-2-TMS
Kiril Panayotov	FRI-2G.309-2-MCDA; FRI-K1-1-QHE
Kiril Veselinov	FRI-2B.313-1-L
Kristian Velev	FRI-1.317-1-MEMBT
Konstantin Koev	FRI-10.326-1-EEEA; FRI-216-1-ITS(S)
Konstantina Galcheva	FRI-LCR-P-2-CT(R)
Krasi Panayotova	FRI-LCR-P-2-CT(R)
Krasimir Kamenov	FRI-2.206-1-TMS
Krasimir Kirilov	FRI-2.206-1-TMS
Krasimir Koev	FRI-2G.510-1-ESIS1
Kremena Rayanova	FRI-2B.312-1-NS
Kristina Zaharieva	FRI-2G.309-1-MCDA
Lachezar Yordanov	FRI-2G.303-1-CCT1
Larry Koroloff	FRI-110-1-PP(S)

Lidiya Petrova	FRI-2.116-ERI
Liqaa Habeb Al-Obaydi	FRI-2G.405-PP
Liubomira Aleksova	FRI-25.25-1-SITSTL
Ljutskan Ljutskanov	FRI-LCR-P-2-BFT(R)
Lora Radoslavova	FRI-2G.405-PP
Loredana Granata	FRI-2K.201-1-HP
Luybomir Dourmishev	FRI-2G.309-1-MCDA
Lybomir Lazov	FRI-1.317-1-MEMBT
Lyubomir Ivanov	FRI-8.303b-1-AMT&ASVM
Lyubomir Lyubenov	FRI-2B.412-1-EM1
Lyubomir Petrov	FRI-8.303b-1-AMT&ASVM
Lyuboslav Lyubenov	FRI-2B.312-1-NS
Manon van Leeuwen	FRI-K1-1-QHE
Margarita Asparuhova-Kandilaro	FRI-2K.201-1-HP
Margarita Georgieva	FRI-LCR-1-CT(R); FRI-LCR-P-2-CT(R)
Margaritka Filipova	FRI-19.206-1-EC
Maria Hristova	FRI-2G.309-1-MCDA
Maria Neikova	FRI-2G.404-1-EM2
Maria Radeva	FRI-2B.313-2-L
Maria Spasova Ivanova-Todorova	FRI-2.116-ERI
Maria Stefanova	FRI-2G.403-LL
Mariana Ilieva	FRI-1.317-1-MEMBT; FRI-LCR-P-2-CT(R)
Mariana Nikolova	FRI-19.206-1-EC
Mariela Dimitorova	FRI-216-1-ITS(S); FRI-LCR-P-2-CT(R)
Mariela Minova	FRI-LCR-P-2-CT(R)
Marin Marinov	FRI-LCR-P-2-CT(R)
Marin Nikolov	FRI-2G.510-1-ESIS2
Marius Cucu	FRI-10.326-2-EEEA
Mariya Georgieva	FRI-LCR-1-BFT(R)
Mariyka Petrova	FRI-2.116-ERI
Marko Timchev	FRI-239-2- PPM(S)
Martin Dejanov	FRI-10.326-2-EEEA
Martina Pencheva	FRI-LCR-1-BFT(R)
Metin Ibryamov	FRI-10.326-1-EEEA
Miglena Mileva	FRI-2K.201-1-HP
Mihaela Geicu-Cristea	FRI-LCR-P-2-BFT(R)
Mihail Iliev	FRI-2G.302-2-CCT2
Mila Galabova-Marinova	FRI-110-1-PP(S)
Milen Ivanov	FRI-2B.312-1-NS
Milen Loukantchevsky	FRI-2G.303-1-CCT1
Milen Minchev	FRI-16.203-1-ID
Milen Sapundzhiev	FRI-216-1-ITS(S)
Milena Dimova	FRI-2B.313-2-L
Milena Savova-Mratsenkova	FRI-25.25-1-SITSTL
Milena Stoyanova	FRI-2G.309-1-MCDA
Mimi Kornazheva	FRI-2G.510-1-ESIS1
Mirena Zaneva	FRI-239-1-PPM(S)

Miroslav Martinov	FRI-2G.302-2-CCT2
Miroslav Mihaylov	FRI-10.326-1-EEEA; FRI-8.303b-1-AMT&ASVM
Miroslav Nedelchev	FRI-2G.302-2-CCT2
Miroslava Bodurova – Eneva	FRI-2B.313-1-L
Miroslava Boneva	FRI-2B.412-1-EM1
Mitko Nikolov	FRI-1.202-1-MR
Mona Elena Popa	FRI-LCR-P-2-BFT(R)
Monika Bedzheva	FRI-2G.302-1-CCT2; FRI-2G.302-2-CCT2
Natalia Mincheva	FRI-110-1-PP(S)
Nataliya Venelinova	FRI-1.322-1-SW
Nefize Ilyazova	FRI-2K.201-1-HP
Negrea Andrei-Alexandru	FRI-10.326-2-EEEA
Neli Babekova	FRI-2B.412-1-EM1
Nevena Ruseva	FRI-2B.312-1-NS
Nevena Stoyanova	FRI-110-2-PP(S)
Neyko Neykov	FRI-2G.303-1-CCT1
Neyko Stoyanov	FRI-LCR-P-2-CT(R)
Nicolay Mihailov	FRI-10.326-2-EEEA
Nikolaj Kovachev	FRI-19.206-1-EC
Nikolay Angelov	FRI-2K.201-1-HP
Nikolay Dimitrov	FRI-2.206-1-TMS; FRI-2.206-2-TMS
Nikolay Ferdinandov	FRI-1.317-1-MEMBT
Nikolay Kostadinov	FRI-2G.303-1-CCT1
Nikolay Nikolov	FRI-2G.302-2-CCT2
Nikolay Petrov	FRI-2G.404-1-EM2
Nikolay Prodanov	FRI-2B.313-1-L
Nikolay Rusev	FRI-2B.412-1-EM1
Nikolay Valov	FRI-216-1-ITS(S)
Nikolay Yordanov	FRI-2G.307-AS
Nikolina Angelova	FRI-K1-1-QHE
Nina Bencheva	FRI-2G.302-1-CCT2
Niya Mileva	FRI-2G.309-2-MCDA
Niya Peneva	FRI-2G.403-LL
Nuno Pombo	FRI-K1-1-QHE
Oana Dinu	FRI-25.25-1-SITSTL
Ognyan Andreev	FRI-2B.412-1-EM1
Ognyan Dimitrov	FRI-216-1-ITS(S); FRI-LCR-P-2-CT(R)
Ognyan Maladzhikov	FRI-2B.313-2-L
Ognyan Petrov	FRI-LCR-P-2-CT(R)
Ognyan Sherbanov	FRI-2G.309-1-MCDA
Ognyan Velev	FRI-2B.313-2-L
Oleksandr Zaichuk	FRI-LCR-P-2-CT(R)
Olena Khomenko	FRI-LCR-P-2-CT(R)
Olha Holubets	FRI-LCR-1-BFT(R)
Orlin Antonov	FRI-19.206-1-EC
Orlin Petrov	FRI-10.326-1-EEEA

Цzge Andiз Зakir	FRI-K1-1-QHE
Panayot Panayotov	FRI-2G.309-2-MCDA
Pauna George-Viorel	FRI-10.326-2-EEEA
Pavel Stoyanov	FRI-25.25-1-SITSTL
Pavel Vitliemov	FRI-2B.412-1-EM1
Pavel Zlatarov	FRI-2G.303-1-CCT1
Pavlina Doykina	FRI-LCR-P-2-BFT(R)
Pepa Dzhedzheva	FRI-2G.309-1-MCDA
Petar Bonchovski	FRI-2B.313-1-L
Petar Bonev	FRI-2G.309-2-MCDA
Petar Penchev	FRI-2G.404-1-EM2
Petar Petrov	FRI-LCR-1-CT(R)
Petar Stoilov	FRI-2G.302-2-CCT2
Petya Abrasheva	FRI-2G.403-LL
Petya Angelova	FRI-1.322-1-SW; FRI-K1-1-QHE
Petya Genkova	FRI-8.303b-1-AMT&ASVM
Petya Mincheva	FRI-2K.201-1-HP
Petya Parashkevova	FRI-2K.201-1-HP
Petya Stefanova	FRI-2G.307-AS
Petya Tabakova	FRI-25.25-2-SITSTL
Plamen Daskalov	FRI-10.326-1-EEEA; FRI-10.326-2-EEEA
Plamen Kangalov	FRI-1.202-1-MR
Plamen Manev	FRI-19.206-1-EC
Plamen Mushakov	FRI-9.2-1-THPE
Plamen Parvanov	FRI-2B.312-1-NS
Plamen Punov	FRI-2.206-1-TMS
Plamen Zahariev	FRI-2G.302-1-CCT2; FRI-2G.302-2-CCT2
Preslava Zhekova	FRI-2G.309-1-MCDA
Prof. Nikola Sabev	FRI-2G.309-1-MCDA
Prof. Pavel Stefanov	FRI-2G.307-AS
Radka Kaneva	FRI-2G.309-1-MCDA
Radoslav Kolev	FRI-25.25-2-SITSTL
Radoslava Deleva	FRI-2K.201-1-HP
Radostin Kostadinov	FRI-2G.303-1-CCT1
Radosveta Bozhilova	FRI-2G.309-1-MCDA
Ralitsa Vasileva-Ivanova	FRI-2.116-ERI
Rosen Ivanov	FRI-2.206-1-TMS; FRI-2.206-2-TMS
Rosen Ivanova	FRI-2.206-1-TMS
Rositsa Krasteva	FRI-2G.309-2-MCDA
Rositsa Titorenkova	FRI-LCR-P-2-CT(R)
Rossen Radev	FRI-1.317-1-MEMBT
Roussi Minev	FRI-1.317-1-MEMBT
Ruja Andreeva	FKI-2B.313-2-L
Rumen Rusev	FRI-2B.412-1-EM1
Rumyana Lebedova	FKI-110-1-PP(S)
Sandrina Babcheva	FRI-25.25-1-SITSTL
Seher Kadırova	FRI-10.326-2-EEEA; FRI-K1-1-QHE
Sergey Kalinkov	FRI-2B.313-2-L
--	--
Silvia Angelova	FRI-110-1-PP(S)
Silvia Krushkova	FRI-2B.312-1-NS
Silvia Tcheparova	FRI-16.203-1-ID
Silviya Beloeva	FRI-1.322-1-SW
Silviya Petkova Toteva	FRI-2.116-ERI
Sime Saka	FRI-10.326-2-EEEA
Simeon Iliev	FRI-2.206-2-TMS
SIvan Ralev	FRI-2G.303-1-CCT1
Siyana Marinova	FRI-2K.201-1-HP
Snezhanka Gencheva	FRI-110-1-PP(S)
Sofia Anguelova	FRI-16.203-1-ID
Stanimir Parvanov	FRI-2G.302-2-CCT2
Stanimir Penev	FRI-25.25-2-SITSTL
Stanimir Stanev	THUR-110-1-KS(S)
Stanka Damyanova	FRI-LCR-1-BFT(R); FRI-LCR-P-2-BFT(R)
Stefania Portolesi	FRI-LCR-P-2-CT(R)
Stefka Karakoleva	FRI-2.116-ERI
Stefka Mindova	FRI-2K.201-1-HP
Stela Boneva	FRI-2G.104-1-HC
Stela Daskalova	FRI-2B.312-1-NS
Steliana Marinova	FRI-1.414-MIP
Stephan Kozhukharov	FRI-LCR-P-2-CT(R)
Stiliyana Cherkezova	FRI-239-1-PPM(S)
Suzana CBndido de Barros Sampaio	FRI-K1-1-QHE
Svetla Andonova	FRI-2G.510-1-ESIS2
Svetla Marinova	FRI-2B.313-1-L
Svetlana Dimitrova	FRI-1.317-1-MEMBT
Svetlana Genieva	FRI-LCR-P-2-CT(R)
Svetlana Koleva	FRI-1.317-1-MEMBT
Svetlana Stefanova	FRI-2G.303-1-CCT1
Svetlin Antonov	FRI-2B.313-2-L
Svetlin Stoyanov	FRI-1.317-1-MEMBT
Svetlozar Grigorov	FRI-10.326-1-EEEA; FRI-216-1-ITS(S)
Svetlozar Tsankov	FRI-1.414-MIP
Svetoslav Martinov	FRI-25.25-2-SITSTL
Svilen Kunev	FRI-2G.404-1-EM2
Svilena Ruskova	FRI-2G.404-1-EM2
Tanya Encheva	FRI-239-2-PPM(S)
Tanya Grozeva	FRI-K1-1-QHE
Tatyana Atanasova	
5	FRI-2G.309-1-MCDA
Tatyana Itova	FRI-2G.309-1-MCDA FRI-2G.309-2-MCDA
Tatyana Itova Temenuzhka Haralanova	FRI-2G.309-1-MCDA FRI-2G.309-2-MCDA FRI-LCR-P-2-CT(R)
Tatyana Itova Temenuzhka Haralanova Teodor Gatev	FRI-2G.309-1-MCDA   FRI-2G.309-2-MCDA   FRI-LCR-P-2-CT(R)   FRI-25.25-2-SITSTL
Tatyana Itova Temenuzhka Haralanova Teodor Gatev Teodor Iliev	FRI-2G.309-1-MCDA   FRI-2G.309-2-MCDA   FRI-LCR-P-2-CT(R)   FRI-25.25-2-SITSTL   FRI-2G.302-1-CCT2

Teodora Ignatova	FRI-2G.302-2-CCT2
Teodora Lachezarova Georgieva	FRI-2.116-ERI
Teodora Nedeva	FRI-2G.309-1-MCDA
Teodora Zhorova	FRI-2G.302-1-CCT2
Tiziano Pacini	FRI-2K.201-1-HP
Todor Delikostov	FRI-1.202-1-MR
Todorka Georgieva	FRI-110-1-PP(S)
Todorka Ivanova	FRI-2.116-ERI
Toncho Balbuzanov	FRI-25.25-1-SITSTL
Toni Uzunov	FRI-1.202-1-MR
Tsanko Yotsov	FRI-2G.309-2-MCDA
Tsveta Bulatova	FRI-2K.201-1-HP
Tsveta Hristova	FRI-2G.104-1-HC
Tsvetan Dimitrov	FRI-LCR-P-2-CT(R)
Tsvetanka Dutsova	FRI-2B.412-1-EM1
Tsvetelina Georgieva	FRI-10.326-1-EEEA; FRI-10.326-2-EEEA; FRI-K1-1-QHE
Tsvetelina Mladenova	FRI-2G.303-1-CCT1
Tsvetomir Gechev	FRI-2.206-1-TMS
Tsvetomira Ivanova	FRI-2K.201-1-HP
Tzanko Golemanov	FRI-2G.303-1-CCT1
Tzvetelin Gueorguiev	FRI-K1-1-QHE
Valentin Atanasov	FRI-239-2- PPM(S)
Valentin Manev	FRI-216-1-ITS(S)
Valentin Velchev	FRI-2K.201-1-HP
Valentina Vasileva	FRI-2G.405-PP
Valentina Voinohovska	FRI-1.414-MIP
Valeri Gamozov	FRI-25.25-2-SITSTL
Valeri Radanov	FRI-2B.313-1-L
Valeria Krachunova-Popova	FRI-2G.307-AS
Vanya Dacheva	FRI-2G.309-2-MCDA
Vanya Georgieva	FRI-2G.510-1-ESIS2
Vanya Panteleeva	FRI-2B.313-1-L
Vasil Kozov	FRI-1.414-MIP
Velislava Doneva	FRI-2G.403-LL
Velizara Pencheva	FRI-25.25-1-SITSTL
Venelin Mandov	FRI-2G.303-1-CCT1
Venko Beschkov	FRI-LCR-P-2-BFT(R)
Ventsislav Keseev	FRI-2G.302-1-CCT2
Vesela Mihova	FRI-1.414-MIP
Veselin Hristov	FRI-1.317-1-MEMBT
Veselina Ancheva	FRI-1.414-MIP
Veselina Dukova	FRI-1.317-1-MEMBT
Veselina Evtimova	FRI-2.116-ERI
Veselka Mihaylova	FRI-2G.104-1-HC
Veska Kirilova	FRI-110-2-PP(S)
Viktor Kirilov	FRI-2G.510-1-ESIS2
Viktor Stoyanov	FRI-2K.201-1-HP

Virginia Centeno	FRI-1.414-MIP
Vladi Vladev	FRI-110-2-PP(S)
Vladimir Canknov	FRI-216-1-ITS(S)
Vladimir Chukov	FRI-2G.510-1-ESIS1
Vladimir Krastev	FRI-2K.201-1-HP
Vladislav Hinkov	FRI-2G.303-1-CCT1
Vladyslav Miroshnikov	FRI-LCR-1-BFT(R)
Vyacheslav Burlaenko	FRI-1.317-1-MEMBT
Vyara Ruseva	FRI-10.326-2-EEEA
Vyarka Ronkova	FRI-2.206-1-TMS
Yoan Petrov	FRI-2K.201-1-HP
Yoana Kaneva	FRI-2B.313-2-L
Yoana Lukanova	FRI-2G.104-1-HC
Yordan Andonov	FRI-2K.201-1-HP
Yordan Doychinov	FRI-16.203-1-ID
Yordanka Dimitrova	FRI-2.206-1-TMS
Yuliana Pashkunova	FRI-2K.201-1-HP
Yuliyan Dimitrov	FRI-2.206-1-TMS
Yuliyana Georgieva	FRI-2G.104-1-HC
Yunzile Dzhelil	FRI-LCR-P-2-CT(R)
Zahariy Dechev	FRI-239-1-PPM(S); FRI-239-2- PPM(S)
Zhivka Goranova	FRI-LCR-P-2-BFT(R)
Zhivka Ilieva	FRI-2G.405-PP
Zina Hristova	FRI-2B.412-1-EM1
Zlatin Zlatev	FRI-10.326-1-EEEA
Zornitsa Dimitrova	FRI-2G.307-AS
Zornitsa Kamenarska	FRI-2G.309-1-MCDA
Zornitsa Yordanova	FRI-2B.313-1-L