



UNIVERSITY PIM BANJA LUKA  
UNIVERZITET PIM BANJA LUKA

X INTERNACIONAL CONFERENCE  
ON SOCIAL AND TECHNOLOGICAL  
DEVELOPMENT

BOOK OF ABSTRACTS

X MEĐUNARODNA KONFERENCIJA  
O DRUŠTVENOM I TEHNOLOŠKOM RAZVOJU

ZBORNİK IZVODA RADOVA



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# X INTERNATIONAL CONFERENCE ON SOCIAL AND TECHNOLOGICAL DEVELOPMENT

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**CONTENT**  
**SADRŽAJ**

<b>PLENARY LECTURERS .....</b>	<b>1</b>
<b>PLENARNA PREDAVANJA</b>	
<b>DEGRADATION AND STABILIZATION OF INOVATIVE MATERIALS .....</b>	<b>2</b>
<i>Milena Marinović Cincović</i>	
<b>EARTHQUAKE AS A SOCIO-TECHNOLOGICAL CHALLENGE.....</b>	<b>3</b>
<i>Lidija Babić</i>	
<b>STRUCTURAL AND STATISTICAL ANALYSIS OF LARGE DATASETS OF TERMS AND RELATED ARTICLES: EXAMPLES FROM WIKIPEDIA .....</b>	<b>4</b>
<i>Zoran Nikolić</i>	
<b>PREPARATION AND CHARACTERIZATION OF NOVEL COMPOSITES INCLUDING BORON NITRIDE .....</b>	<b>5</b>
<i>Vesna Teofilović, Henda S. A. Abdussalam, Jelena Pavličević, Ayse Z. Aroguz</i>	
<b>ECOLOGY, ENERGETIC EFFICIENCY AND GREEN ENERGY.....</b>	<b>6</b>
<b>EKOLOGIJA, ENERGETSKA EFIKASNOST I ZELENA ENERGIJA</b>	
<b>ESTIMATION OF SOLAR IRRADIANCE ON TILTED SURFACE FACING SOUTH IN ČAČAK, SERBIA.....</b>	<b>7</b>
<i>Snežana Dragičević, Milan Marjanović, Vojislav Vujičić, Danijela Milošević</i>	
<b>TOWARD SUSTAINABLE URBAN DEVELOPMENT - GREEN ROOFS .....</b>	<b>8</b>
<i>Marija Jevrić, Ivana Čipranić, Nataša K. Vuković</i>	
<b>KEY ISSUES OF DEVELOPMENT OF ALTERNATIVE ENERGY AND FORM OF ENERGY EFFICIENCY IN ARMENIA .....</b>	<b>9</b>
<i>Anna Arshak Mktchyan-Arshakyan, Marine Armen Nalbandyan</i>	
<b>NEARLY ZERO ENERGY BUILDINGS – THE ROAD TO LOW CARBON CITIES .....</b>	<b>10</b>
<i>Ana Radojević, Danijela Nikolić, Jasmina Skerlić, Jasna Radulović</i>	
<b>DIESEL ENGINE HAZARD PARTICLES EMISSION AND MEASURES TO ELIMINATE THEM.....</b>	<b>11</b>
<i>Slobodan Tošić, Radenka Bjelošević</i>	
<b>GREEN STREETS - A MODEL FOR IMPROVING THE QUALITY OF LIFE AND OF THE ENVIRONMENT .....</b>	<b>12</b>
<i>Tanja Trkulja, Dubravko Aleksić</i>	
<b>PUBLIC LIFE - USERS' ROLE IN THE DESIGN OF OPEN PUBLIC CITY SPACES.....</b>	<b>13</b>
<i>Dubravko Aleksić, Tanja Trkulja</i>	
<b>ORGANIC WASTE AS A SOURCE OF ENERGY AND ORGANIC FERTILIZER.....</b>	<b>14</b>
<i>Ljiljana Tanasić, Biljana Delić, Saša Spasojević, Bojan Damnjanović</i>	
<b>WASTEWATER IN SABAC - CURRENT SITUATION AND FUTURE TREATMENT DIRECTIONS.....</b>	<b>15</b>
<i>Suzana Knežević</i>	
<b>INDUSTRIAL WASTE AS A NEW ADSORBENT FOR Cu<sup>2+</sup> REMOVAL FROM AQUATIC SOLUTIONS.....</b>	<b>16</b>
<i>Milena Tadić, Irena Nikolić, Dijana Đurović, Nevena Cupara, Ivana Milašević</i>	
<b>MACROPHYTES IN ASSESSMENT OF ECOLOGICAL POTENTIAL OF HYDRO-ACCUMULATIONS ON FRUŠKA GORA .....</b>	<b>17</b>
<i>Milica Živković, Bojan Damnjanović, Branko Miljanović</i>	
<b>SURFACE WATER QUALITY MONITORING IN TREBISNJICA RIVER BASIN.....</b>	<b>18</b>
<i>Sanja Čučković</i>	



**HEALTH RISK ASSESSMENT IN AGRICULTURAL SOILS IN A CITY OF PLJEVLJA (MONTENEGRO)..... 19**

*Nevena Cupara, Dijana Đurović, Ivana Milašević, Irena Nikolić*

**RESIDENTIAL HEATING WITH WOOD AND WOOD PELLETS: LIFE CYCLE COST ANALYSIS AND AIR QUALITY IMPACTS ..... 20**

*Sandra Spirova, Aneta Vasiljevic-Shikaleska*

**POTENTIAL OF ORGANIC PLANT PRODUCTION FROM THE PERSPECTIVE OF YOUTH IN SERBIA ..... 21**

*Vera Rašković, Nemanja Stošić, Milan Glišić, Stefan Marković*

***ECONOMY AND MANAGEMENT* ..... 22**

***EKONOMIJA I MENADŽMENT***

**CONSTITUTION AS A STIMULATION FACTOR OF CONSTRUCTION SOCIOCULTURAL CAPITAL ..... 23**

*Nikša Grgurević*

**INSTITUTIONAL CHANGES IN PORT FUNCTIONS, SERVICES AND ADMINISTRATIVE MODELS ..... 24**

*Nikša Grgurević, Gordana Radović*

**THE BASIS OF A NEW CONCEPT OF SOCIAL ECONOMY ..... 25**

*Mirko Miličević, Milorad Đukić*

**THE IMPACT OF THE COVID-19 EPIDEMIC ON ECONOMIC TRENDS IN BOSNIA AND HERZEGOVINA ..... 26**

*Ljiljana Jović, Mladen Ivić*

**COMPARATIVE ANALYSIS OF ECONOMIC GROWTH OF THE FORMER YUGOSLAV COUNTRIES ..... 27**

*Ognjen Bakmaz<sup>1</sup>, Mina Kovljenić, Nenad Marković*

**INNOVATIVE CAPACITY OF THE WESTERN BALKAN COUNTRIES AS A LIMITING FACTOR OF THEIR ECONOMIC GROWTH ..... 28**

*Andrea Andrejević Panić, Aleksandar Kostić, Slobodan Cvetanović*

**COMPETITIVENESS IN MODERN BUSINESS PRESENTED THROUGH BASIC STRUCTURAL INDICATORS OF BUSINESS OPERATIONS OF ENTERPRISES AND ENTREPRENEURS: THE CASE OF THE REPUBLIC OF SRPSKA ..... 30**

*Mirjana Milovanović, Ružica Đervida, Branka Marković*

**DIGITAL BUSINESS TRANSFORMATION IN THE CONDITIONS OF THE COVID-19 PANDEMIC IN THE REPUBLIC OF SRPSKA..... 31**

*Mihajlo Travar, Saša Ristić, Igor Dugonjić*

**CURRENT STATE OF USE OF THE CONCEPT OF CIRCULAR ECONOMY IN THE AUTOMOTIVE INDUSTRY IN SLOVAKIA ..... 33**

*Anna Krivjanská, Gabriela Mezeiová, Rudolf Pástor*

**THE CONCEPT OF REAL EXCHANGE RATE AND STRENGTHENING THE COMPETITIVENESS OF THE ENTERPRISE AND THE STATE AS A PRECONDITION FOR OVERCOMING THE CRISIS AND THE ELIMINATION OF IMBALANCE..... 34**

*Dejan Grujić*

**THE IMPORTANCE OF COMMUNICATION SKILLS IN MODERN BUSINESS ..... 35**

*Ljubomir Zuber*

**HOW INNOVATIVE LEADERS COULD ENCOURAGE CREATION OF NEW VALUES IN THE ORGANIZATION ..... 36**

*Tatjana Mamula Nikolić*



<b>THE EFFECT OF WORK-RELATED STRESS ON EMPLOYEE SATISFACTION: A CASE STUDY .....</b>	<b>37</b>
<i>Azemina Mashovic</i>	
<b>SPECIFICS OF HUMAN RESOURCES MANAGEMENT IN FAMILY BUSINESSES....</b>	<b>38</b>
<i>Marko Simonović, Jelena Stojanović Alcaraz, Stefan Milojević, Jovan Travica</i>	
<b>EDUCATION OF EMPLOYEES AS A FACTOR OF BUSINESS SUCCESS.....</b>	<b>39</b>
<i>Marija Čukanović-Karavidić, Slavko Karavidić, Gordana Gavrić</i>	
<b>UNEMPLOYMENT AND SELF-EMPLOYMENT IN THE REPUBLIC OF SRPSKA: STATE OF AFFAIRS, DEVELOPMENT, AND ATTITUDES OF THE SELF-EMPLOYED AND UNEMPLOYED.....</b>	<b>40</b>
<i>Draško Gajić, Ana Gavrilović</i>	
<b>CHANGE MANAGEMENT AS AN INTEGRAL PART OF COMPANY MANAGEMENT</b>	<b>42</b>
<i>Biljana Bjelica, Ognjen Bakmaz, Dragan Vukasović</i>	
<b>MIGRATION CRISIS MITIGATION AND MANAGEMENT IN THE UNA SANA CANTON.....</b>	<b>43</b>
<i>Amela Čolić, Hamdija Lipovača, Belma Bajrić</i>	
<b>COMPARISON OF MULTI-CRITERIA DECISION MAKING METHODS: IS IT ALL THE SAME? .....</b>	<b>44</b>
<i>Nenad Medić, Zoran Anišić</i>	
<b>INFLUENCE OF CORONAVIRUS ON CONSUMER BEHAVIOR .....</b>	<b>45</b>
<i>Mladen Milić, Jelena Vitomir, Dražen Vrhovac</i>	
<b>IMPLICATIONS OF SECURITY MARKETING ON THE BUSINESS ENVIRONMENT AND MULTIPLICATION OF MARKET ACTIVITIES .....</b>	<b>46</b>
<i>Saša Mitrić</i>	
<b>SECURITY MARKETING, AS A MANIFESTATION AND PHASE OF INSTITUTIONAL DEVELOPMENT.....</b>	<b>48</b>
<i>Saša Mitrić</i>	
<b>TESTING THE SATISFACTION OF PROFESSIONAL CUSTOMERS IN THE AUTOMOTIVE AFTERMARKET SPARE PARTS INDUSTRY WITH THE PURPOSE OF IMPROVING SALES: THE CASE OF BALKANS .....</b>	<b>49</b>
<i>Mirjana Milovanović</i>	
<b>FIRMA (BUSINESS NAME) OF A COMMERCIAL SOCIETY IN THE COUNTRIES THAT ORIGINATED FROM THE FORMER REPUBLICS OF THE SFRJ .....</b>	<b>50</b>
<i>Miroslav Milosavljević, Jelena Milosavljević, Isidora Milošević</i>	
<b>MODERN FORMS OF SALES AND PROMOTION IN THE CONTEXT OF A PANDEMIC .....</b>	<b>51</b>
<i>Biljana Rađenović Kozić</i>	
<b>PROMOTION OF HIGHER EDUCATION INSTITUTIONS ON SOCIAL NETWORKS</b>	<b>52</b>
<i>Jelena Ružić, Jelena Poznanović, Branko Ćurlić, Đorđe Janevski</i>	
<b>SIMULATED ENTERPRISE - INNOVATIVE TOOL WORK FOR ROMANIAN HIGHER EDUCATION.....</b>	<b>53</b>
<i>Marius Calin Benea</i>	
<b>CRISIS MANAGEMENT AND MARKETING IN TOURISM .....</b>	<b>54</b>
<i>Dragan Bulatović, Bojana Ostojić</i>	
<b>GREEN MARKET CLASSIFICATION-THE CASE OF DUBROVNIK .....</b>	<b>55</b>
<i>Marija Dragičević Ćurković, Antonija Grgat</i>	
<b>THE ROLE OF TOUR OPERATORS AND HOTELS IN THE SUSTAINABLE TOURISM DEVELOPMENT.....</b>	<b>56</b>
<i>Marija Dragičević Ćurković</i>	

**FINANCIAL RATIO ANALYSIS OF THE GASTRONOMY COMPANY  
“UGOSTITELJSTVO - SIMIĆ M”: CASE STUDY ..... 57**

*Vujić Milan, Jelena Stojanović Alcaraz, Stefan Milojević, Jovan Travica, Tamara Vujić*

**TOURISM AND ENVIRONMENT ..... 58**

*Denis Stojkanović, Lazar Ivanov*

**PROTECTED AREAS AND SUSTAINABLE TOURISM: NATIONAL PARK SUTJESKA60**

*Aleksandar Lugonja*

**THE IMPACT OF THE COVID-19 PANDEMIC ON FOOD SECURITY, POVERTY AND  
SOCIAL EXCLUSION ..... 61**

*Mina Kovljenić, Jovana Škorić*

**MODERN PERSPECTIVES FOR SUSTAINABLE DEVELOPMENT OF ECONOMIC AND  
ENVIRONMENTAL POLICY ..... 62**

*Denis Stojkanović, Zdravka Petković*

**BANKING UNION OF THE EURO AREA IN THE PERIOD OF THE FINANCIAL CRISIS  
..... 63**

*Ivana Rađenović*

**ANALYSIS OF ATTITUDES AND PERCEPTIONS OF BIH CITIZENS ABOUT  
CORRUPTION IN THE WORKPLACE ..... 64**

*Simonida Vilić, Tatjana Dujaković*

**THE CORRELATION BETWEEN GENDER AND POLITICANS’ BEHAVIOUR DURING  
THE PANDEMIC IN SLOVENIA: CASE STUDY ..... 65**

*Anton Vorina*

**ETHICAL ADVERTISING FOR A POSITIVE SOCIAL IMPACT ..... 66**

*Miro Mihec*

**LAW AND SECURITY SECTION..... 67**

**PRAVO I BEZBJEDNOST**

**ASSESSMENT OF SECURITY COUNCIL ACTIVITIES IN PEACEFUL SETTLEMENT  
OF DISPUTES ..... 68**

*Predrag Raosavljević, Onahti Čerkez*

**THE EUROPEAN CONVENTION FOR THE PROTECTION OF HUMAN RIGHTS AND  
FUNDAMENTAL FREEDOMS WITH SPECIAL REFERENCE TO ITS ENFORCEMENT  
IN BOSNIA AND HERZEGOVINA ..... 70**

*Željko Todorović*

**LIABILITY FOR DEFECTIVE PRODUCTS AND THE EPITOME OF COMPENSATION  
UNDER EU CONSUMER LAW: IS THE LEGAL FRAME ADEQUATELY SHAPED? .. 72**

*Juanita Goicovici*

**REPORTING OBLIGATIONS IN THE FUNCTION OF PROTECTION OF THE RIGHTS  
OF NON-CONTROLLED SHAREHOLDERS ..... 73**

*Miloš Grujić, Boris Srdić, Zdravko Zečević, Gordana Drobnjak*

**MEMBERS OF THE LGBT COMMUNITY UNDER ARTICLE 10 OF THE EUROPEAN  
CONVENTION FOR THE PROTECTION OF HUMAN RIGHTS ..... 75**

*Darko Dimovski, Ivan Ilić, Katarina Momirović*

**CONSEQUENCES OF NEGOTIATIONS WITH THE WORLD TRADE ORGANIZATION  
AND THEIR IMPACT ON THE ENVIRONMENT OF THE REPUBLIC OF SERBIA..... 76**

*Aleksandra Milošević, Milena Milojević, Goran Stanišić*

**MONEY LAUNDERING ..... 77**

*Suzana Malešić*

**CRIMINAL INVESTIGATION OF MONEY LAUNDERING AT THE REAL ESTATE MARKET..... 78**

*Ajla Šurković*

**QUALITY OF COOPERATION AND PARTNERSHIP POLICE AND CITIZENS IN A SAFE COMMUNITY..... 79**

*Mile Matijević, Miladinović Aleksandar, Mitrović Dragan*

**CRIMINOLOGICAL ASPECTS OF THE INTERNET AND ITS ROLE IN CYBER CRIME ..... 80**

*Biljana Dimitrić*

**GEOPOLITICS, GLOBALIZATION AND SECURITY ..... 81**

*Dražan Erkić, Aco Bobić*

**LEGAL CUSTOMS AND MORAL STANDARDS FOR WAIVER OF INHERITANCE... 82**

*Zoran Filipović*

**THE INFLUENCE OF SUPERNATIONAL COURTS ON ADMINISTRATIVE JUDICIAL LAW ..... 83**

*Goran Branković*

**WHO HAS THE RIGHT TO A DECEASED BODY?..... 84**

*Nina Planojević, Dragica Živojinović*

**INFORMATION TECHNOLOGY AND MEDIA ..... 85**

**INFORMACIONE TEHNOLOGIJE I MEDIJI**

**NEW MATHEMATICAL MODEL FOR SOFTWARE SOLUTION OF MODIFIED TRANSPORTATION PROBLEM ..... 86**

*Vladimir Milićević, Nemanja Zdravković, Jovana Jović*

**MACHINE LEARNING IN PYTHON: POSSIBILITIES AND LIMITATIONS ..... 87**

*Ivan Petrović, Hristina Delibašić, Violeta Petrović*

**DESIGNING A DIGITAL SYSTEM FOR LIQUID LEVEL INDICATION USING COMBINATIONAL LOGIC CIRCUITS AND MICROCONTROLLER SYSTEMS ..... 88**

*Ivan Petrović, Hristina Delibašić, Violeta Petrović*

**SOFTWARE DEVELOPMENT FOR THE GAME 'SEAWAYS' ..... 89**

*Blagodar Lovčević, Miodrag Milićević, Nikola Marković, Marko Boljanić, Mladen Lovčević*

**MATERIALS AND SHADING ON BUILDINGS IN 3 DS MAX PROGRAM ..... 90**

*Miodrag Milićević, Blagodar Lovčević, Danijel Čabarkapa*

**ONLINE TEACHING DURING COVID-19, ITS – BELGRADE, THE CASE STUDY..... 91**

*Svetlana Anđelić, Bojan S. Ristić, Goran Radić, Velimir Dedić, Milena Ilić*

**TRAFFIC ACCIDENT ANALYSIS USING ARTIFICIAL NEURAL NETWORK..... 92**

*Marija Blagojević, Željko Jovanović, Danijela Milošević, Snežana Dragičević*

**OPTIMIZING ENERGY CONSUMPTION OF AVR BASED IoT DEVICES ..... 93**

*Saša Salapura, Nebojša Kuduz*

**E – BOOK AND ITS ACADEMIC FUTURE..... 94**

*Aldin Obučina, Ahmed Palić, Admir Šupić*

**MEDIA AS DEMARGINALIZATION FACTOR..... 95**

*Borka Vukajlović, Gordana Budimir-Ninković, Vesna S. Trifunović*

**ENGINEERING, TECHNOLOGY AND MATERIALS..... 96**

**INŽENJERSTVO, TEHNOLOGIJE I MATERIJALI**

**FABRICATION OF TEMPERATURE AND pH SENSITIVE BIOPOLYMER/CLAY SCAFFOLD AS DRUG CARRIER FOR RENTIDINE – HCL ..... 97**

*Vesna Teofilovic, Busra Agan, Davut Lacin, Jelena Pavličević, Mirjana Jovičić, Nevena Vukić, Ayse Z. Aroguz*

**SWELLING KINETICS OF ENERGY EFFICIENTLY SYNTHESIZED HYDROGELS INTENDED FOR HYGIENE PRODUCTS..... 98**

*Tamara Erceg, Suzana Cakić, Vesna Teofilović, Nevena Vukić, Jelena Tanasić, Ivan Ristić*

**SYNTHESIS, CHARACTERIZATION AND ANTIOXIDATIVE PROPERTIES OF THE FIRST BIGINELLI-BASED ORGANOGELS ..... 99**

*Nenad Janković, Emilija Milović, Jelena Petronijević, Nenad Joksimović, Dušan Milivojević*

**IONIC LIQUID BASED ELECTROLYTES FOR RENEWABLE ENERGY STORAGE DEVICES ..... 100**

*Sanja Rackov, Milan Vraneš, Snežana Papović, Teona Teodora Borović, Branka Pilić*

**IRRADIATION MODIFIED BIOCHAR FOR HEAVY METAL ADSORPTION IN AQUEOUS SOLUTION ..... 101**

*Đurica Katnić, Slavica Porobić, Aleksandar Krstić, Jelena Petrović, Marija Kojić, Dragana Živojinović, Milena Marinović-Cincović*

**REMOVAL OF  $Pb^{2+}$  IONS FROM AQUEOUS SOLUTIONS BY MODIFIED HYDROCHAR OF THE SPENT MUSHROOM SUBSTRATE ..... 102**

*Marija Kojić, Slavica Porobić, Đurica Katnić, Biljana Sikirić, Antonije Onjia, Milena Marinović-Cincović*

**RHEOLOGICAL EQUATION FOR FRP REINFORCED CONCRETE MODEL..... 103**

*Nataša Kopitović-Vuković, Nikola Baša, Radomir Zejak, Marija Jevrić*

**CORROSION OF SMA MATERIALS..... 104**

*Stanica Nedović, Špiro Ivošević*

**THE DEVELOPMENT OF AN ALGORITHM FOR CNC MACHINING QUALITY IMPROVEMENT..... 105**

*Strahinja Đurović, Dragan Lazarević, Jelena Stanojković, Živče Šarkoćević, Jasmina Dedić*

**EFFECT OF CAM SYSTEMS INTEGRATION INTO PRECISE PRODUCTION OF TOLERATED GROOVES ..... 106**

*Jan Duplak, Darina Duplakova, Michal Hatala, Enes Sukić*

**DIGITAL ERGONOMICS – A PART OF INDUSTRY 4.0 STRATEGY ..... 107**

*Darina Duplakova, Jan Duplak, Svetlana Radchenko, Enes Sukić*

**INTRODUCTION OF THE PRINCIPLES OF INDUSTRY 4.0 IN THE PRODUCTION PROCESS OF MICRO-ENTERPRISE – CASE STUDY ..... 108**

*Igor Fürstner, László Gogolák, Árpád Pletikoszty*

**APPLICATION OF TAGUCHI METHOD AND REGRESSION ANALYSIS ON SURFACE ROUGHNESS IN END MILLING OF ALUMINUM 6082-T6..... 109**

*Jelena Stanojković, Dragan Lazarević, Živče Šarkoćević, Ivica Čamagić*

**THE EFFECT OF EXTRUSION CONDITIONS ON THE POROSITY OF RICE SNACK WITH ADDED CHICORY ROOT ..... 110**

*Jelena Perović, Jovana Kojić, Jelena Lubura, Jelena Krulj, Lato Pezo, Vanja Šeregelj, Nebojša Ilić*

**CORRELATION OF SELECTED TEXTURAL PARAMETERS OF RICE SNACK WITH ADDED CHICORY ROOT ..... 111**

*Jovana Kojić, Jelena Perović, Jelena Krulj, Lato Pezo, Bojana Filipčev, Bojana Kokić, Nebojša Ilić*

**PHYSICO-CHEMICAL PROPERTIES OF HIGH-PROTEIN PUMPKIN PORRIDGE BASED ON SPELT WHEAT ..... 112**

*Olivera Šimurina, Biljana Cvetković, Bojana Filipčev, Milana Rošul, Jovana Kojić, Jelena Krulj, Branislava Đermanović*

**OSMODEHYDRATED WHITE CABBAGE-NUTRITION, SENSORY AND MICROBIOLOGICAL PROFILE ..... 113**

*Biljana Cvetković, Lato Pezo, Olivera Šimurina, Jovana Kojić, Jelena Krulj, Biljana Lončar, Milica Nićetin*

**EFFECT OF MILK FAT CONTENT ON THE QUALITY CHARACTERISTICS OF FRESH CHEESE..... 114**

*Danica Savanović, Ana Velemir, Jovo Savanović, Bojana Dmitrović*

**INFLUENCE OF COAGULATION CONDITIONS ON THE MINERAL COMPOSITION OF ACID-COAGULATING CHEESES..... 115**

*Danica Savanović, Ana Velemir, Nevena Ritan, Jovo Savanović*

**CHARACTERISTICS OF PSEUDOMONAS SPP. FROM RAW MILK ..... 116**

*Biljana Delic Vujanovic, Ljiljana Tanasic, Radoslava Savic Radovanovic*

**GASTRONOMY OFFER OF VEGETABLE DISHES ..... 117**

*Gordana Jovanović, Đorđe Alavuk, Bojan Damnjanović, Ana Vasić*

**BODY AND TECHNOLOGY - CYBORG AS A NEW PARADIGM OF THE CONTEXT OF IDENTITY IN ART ..... 118**

*Ljubica Janjetović*

***PSYHOLOGY* ..... 119**

***PSIHOLOGIJA***

**SOCIAL-DEMOGRAPHIC CHARACTERISTICS OF PSYCHOTIC PATIENTS, OFFENDERS AND NON-OFFENDERS OF BLOOD FELONY ..... 120**

*Snežana Samardžić*

**GROUP PSYCHOTHERAPY OF SOCIAL ANXIETY OF STUDENTS: REVIEW OF ONE CYCLE OF GROUP PSYCHOTHERAPEUTIC WORK ..... 121**

*Darjana Sredić*

**SOCIO-DEMOGRAPHIC CHARACTERISTICS AND JOB SATISFACTION OF HEALTHCARE WORKERS ..... 122**

*Dijana Đurić, Biljana Mirković*

**ATTITUDES OF EMPLOYEES IN PRIVATE AND STATE SECONDARY SCHOOLS ON THE IMPORTANCE OF BUSINESS COMMUNICATION ..... 123**

*Danijela Jokanović*

**INFLUENCE OF SOCIO-DEMOGRAPHIC FACTORS ON MOTIVATION FOR WORK ..... 124**

*Danijela Jokanović*

**PSYCHOPATHY FROM THE PERSPECTIVE OF NEUROSCIENCE WITH REFERENCE TO LEGAL IMPLICATIONS..... 125**

*Mladen Cimeša, Biljana Dimitrić*

***MEDICAL SCIENCES* ..... 126**

***MEDICINSKE NAUKE***

**IMPLEMENTATION OF INFORMATION TECHNOLOGIES IN THE HEALTHCARE SYSTEM OF SERBIA - PATIENTS' ATTITUDES ABOUT E-PRESCRIPTION ..... 127**

*Svetlana Stojkov, Jadranka Đuranović-Miličić, Dejan Živanović, Nataša Jovanović Lješević, Jovan Javorac*

**EFFECTS OF MASS MEDIA IN THE COVID-19 PANDEMIC ON HEALTH PROMOTION ..... 129**

*Jadranka Đuranović-Miličić, Svetlana Stojkov, Dejan Živanović, Jovan Javorac, Svetozar Đuranović, Stjepanović Ivana*

**EDUCATION ..... 130**

**OBRAZOVANJE**

**CULTIVATING DIVERGENT THINKING IN MATHEMATICS THROUGH OPEN-ENDED TASKS AT PRESCHOOL AGE..... 131**

*Nebojša Budimirović*

**QUALITY OF EDUCATIONAL SERVICE IN VOCATIONAL SCHOOL FOR CATERING, TRADE AND TOURISM IN BANJA LUKA ..... 132**

*Predrag Tošić, Bojana Kalenjuc, Maja Banjac, Goran Radivojević*

**MASTER APPLIED STUDIES FOR PRESCHOOL TEACHERS WITH SPECIAL REFERENCE TO PROFESSIONAL PRACTICE DURING THE COVID 19 EPIDEMIC..... 133**

*Ljiljana Stankov, Mira Jovanović, Sanja Vuletić*

**SERBIAN PRIMARY SCHOOL TEACHERS' (SELF) ASSESSMENT IN REGARD TO THE TEACHING MODELS APPLIED IN PRACTICE ..... 134**

*Ivana Vučetić, Snežana Kirin, Nena A. Vasojević, Aleksandar Sedmak*

**METHODOLOGICAL INNOVATIONS IN CLASSROOM TEACHING..... 135**

*Dragana Aleksić*

**THE INFLUENCE OF THE COVID-19 VIRUS PANDEMIC ON HIGHER EDUCATION..... 136**

*Irena Petrušić, Bojana Ostojić, Dragan Bulatović, Milutin Pečić*

**HIGHER EDUCATION IN MONTENEGRO: ADAPTATION FROM THE TRADITIONAL TO DISTANCE LEARNING SYSTEM ..... 137**

*Sanja Samardžić, Dragana Savić*

**THE INFLUENCE OF DIGITALIZATION ON THE ACQUISITION OF ENGLISH AS A FOREIGN LANGUAGE..... 138**

*Irena Petrušić, Jelena Poznanović*

**PASSIVE CONSTRUCTIONS IN THE ENGLISH AND SERBIAN LANGUAGE..... 140**

*Nada Buzadžić Nikolajević*

**FROM GOTHIC TO FEMINIST FEMALE CHARACTERS IN WUTHERING HEIGHTS..... 141**

*Ivana Aleksić, Snježana Milačak*

**WOMEN'S QUEST FOR THE INDIVIDUAL IDENTITY LOST IN THE COLLECTIVE ONE IN CONTEMPORARY AMERICAN POETRY ..... 142**

*Snježana Milačak, Ivana Aleksić*

**ADDITIONAL PAPERS..... 143**

**DODATNI RADOVI**

**DATA MONITORING FROM THE AUTOMATIC STATIONS ALONG THE TREBISNJICA RIVER USING THE SOFTWARE APPLICATION ..... 144**

*Bojana Milišić*

**CONTRIBUTION TO GROWTH AND EFFICIENCY OF CROWDFUNDING MARKETING IN ..... 145**

*Mario Milaković*

**A STUDY ON ARTIFICIAL INTELLIGENCE APPLICATIONS IN FIGHTING COVID-19 PANDEMIC..... 146**

*Mansur Jaba, Khalefa Alnagasa, Ayoub Nasr, Ali Elsadai, Anwer A. Niriv*

## IRRADIATION MODIFIED BIOCHAR FOR HEAVY METAL ADSORPTION IN AQUEOUS SOLUTION

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### ABSTRACT

Biochar produced by pyrolysis of plum and fig pomace at 500 C were characterized and investigated as adsorbents for the removal of heavy metal ions from aqueous solution. Plum and fig pomace are formed after fermentation of this fruit which is used for the preparation of brandy. The brandy industry generates huge amounts of pomace as industrial waste, so pyrolysis as thermochemical technologies was used for organic agro-industrial waste treatment.

Plum and fig pomace before and after pyrolysis was characterized using proximate, inorganic and elemental analysis, Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), X-ray diffraction (XRD), thermogravimetric analysis (TGA) and differential thermal analysis (DTA).

Biochar has a carbon matrix with a high degree of porosity and large surface area, suggesting that it can be used as a surface adsorbent and thus have a significant role in controlling environmental contaminants.

The surface modification by gamma irradiation was done to enhance the adsorption capacity of biochar. The heavy metals contents in aqueous solution were analyzed using ICP-OES. The adsorption capacity was estimated using the Langmuir and Freundlich model.

The results of this work suggest that pyrolysis and irradiation of biomass is a promising way to produce efficient heavy metal sorbents for waste-water treatment.

**Keywords:** pomace; biochar; heavy metal adsorption; irradiation.