



FEDERATION OF THE SCIENTIFIC ENGINEERING UNIONS (FSEU)

**XXVII INTERNATIONAL SCIENTIFIC  
CONFERENCE**

**trans &  
MOTAUTO  
- 2019 -**

**PROGRAM**

**ORGANIZER:**

SCIENTIFIC-TECHNICAL UNION OF MECHANICAL ENGINEERING

*17 – 20.06.2019  
VARNA, BULGARIA*

# PROGRAM

## 17.06.2019 (MONDAY)

|               |              |                                 |
|---------------|--------------|---------------------------------|
| 16:00 – 20:00 | REGISTRATION | IN FRONT OF THE CONFERENCE HALL |
|---------------|--------------|---------------------------------|

## 18.06.2019 (TUESDAY)

|               |              |                                 |
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| 08:00 – 10:00 | REGISTRATION | IN FRONT OF THE CONFERENCE HALL |
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| <b>CONFERENCE HALL</b> |   |                               |
| 10:00 – 10:15          | OPENING OF THE CONFERENCE   |                               |
| 10:15 – 12:30          | SECTION “TRANSPORT. SAFETY AND ECOLOGY. LOGISTICS AND MANAGEMENT. EDUCATION THEORY” |                               |
| 12:30                  | COLLECTIVE PICTURES OF THE PARTICIPANTS   | IN FRONT OF THE SWIMMING POOL |

## LUNCH BREAK 12:30 - 14:00 (NO LUNCH PROVIDED)

|                        |  |  |
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| <b>CONFERENCE HALL</b> |  |  |
| 14:00 – 16:00          | SESSION “TRANSPORT TECHNIQUES. INVESTIGATION OF ELEMENTS. VEHICLE ENGINES” |  |

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| 16:00 – 16:30 | COFFEE BREAK - CONFERENCE BAR |  |
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|---------------|-------------|--|
| 16:30 – 18:00 | DISCUSSIONS |  |
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| <b>CONFERENCE HALL</b> |                |  |
| 09:00 – 19:00          | POSTER SESSION |  |

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| 19:30 – 24:00 | “WELCOME” COCKTAIL - CONFERENCE BAR |  |
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## 19.06.2019 (WEDNESDAY)

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| <b>CONFERENCE HALL</b> |                |  |
| 09:00 – 13:00          | POSTER SESSION |  |

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| 10:00 | CLOSING OF THE CONFERENCE - WINE AND CHEESE PARTY | CONFERENCE BAR |
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## 20.06.2019 (THURSDAY)

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| 10:00 | OPENING OF THE CONFERENCE “POWER TRANSMISSIONS 2019” | HALL 1 |
| 10:00 | OPENING OF THE CONGRESS “INNOVATIONS 2019”           | HALL 2 |

# SCIENTIFIC PROGRAM

|                             |   |                 |
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| 18.06.2019<br>10:00 – 10:15 | OPENING OF THE CONFERENCE               | CONFERENCE HALL |
|                             | CHAIRMAN:<br>PROF. DR. ANTOANETA KIROVA |                 |

|                             |  |                 |
|-----------------------------|--|-----------------|
| 18.06.2019<br>10:15 – 12:30 | SESSION “TRANSPORT. SAFETY AND ECOLOGY.<br>LOGISTICS AND MANAGEMENT. EDUCATION THEORY” | CONFERENCE HALL |
|-----------------------------|--|-----------------|

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| CHAIR: PROF. DR. ANTOANETA KIROVA (BG) | CO-CHAIRMAN: ASSOC. PROF. DR. ZHAVORONKOV V. (UA) |
|--|---|

|   |  |   |    |    |
|---|--|---|----|----|
| 1 | A NEW APPROACH TO THE HUMAN FACTOR'S ASSESMENT IN THE AUTOMATED CONTROL SYSTEM OF AVIATION SECURITY IN THE AIRPORT | <sup>1</sup> Filippov V.L., <sup>1</sup> Elisov L.N., <sup>2</sup> Ovchenkov N.I.,<br><sup>1</sup> State Research Institute of Civil Aviation, Moscow, Russian Federation<br><sup>2</sup> P.G.Demidov Yaroslavl State University, Yaroslavl, Russian Federation | 05 | RU |
| 2 | INFLUENCE OF LIBERALIZATION ON LONG-DISTANCE RAIL TRANSPORT IN THE CZECH REPUBLIC                                  | Ing. Vít Janoš, PhD., Ing. Milan Kříž<br>Faculty of Transportation Sciences – Czech Technical University in Prague, Czech Republic  | 33 | CZ |
| 3 | MODEL FOR ASSESSMENT OF POLLUTANT EMISSIONS FROM ROAD TRANSPORT ON NATIONAL ROADS OF THE REPUBLIC OF SERBIA        | Prof. Dr Manojlović A. , M.Sc. Trifunović J. , M.Sc. Milović M., Prof. Dr Kaplanović S.<br>University of Belgrade   | 13 | RS |
| 4 | TRANSPORTATION OF LIQUEFIED FUEL GAS IN CONTAINERS   | Prof. Dr. Kochadze T., Dr. Gvarishvili B., Dr. Markelia B.<br>Akaki Tsereteli State University - Kutaisi  | 39 | GE |
| 5 | TRANSIT CAPACITIES OF THE SOUTH CAUCASUS TRANSPORT CORRIDOR  | Prof. Dr. Kochadze T., Prof. Dr.Chabukiani R, Doctoral candidate Mikeladze I. , Master G.Iakobidze<br>AkakiTsereteli State University <sup>1</sup> - Kutaisi, Georgia   | 41 | GE |
| 6 | DESIGN OF AN INNOVATIVE LUGGAGE STORAGE SYSTEM FOR PASSENGER TRAINS  | L.Cucu PhD., M. Stoica PhD., N. Crisan PhD., G.F. Stoica<br>University Politehnica of Bucarest,   | 14 | RO |
| 7 | USER INTERFACE OF AN INNOVATIVE EXTERNAL BAGGAGE STORAGE SYSTEM FOR PUBLIC TRANSPORTATIONS                         | M. Stoica,L. Cucu, N. Crisan<br>University Politehnica of Bucarest  | 15 | RO |

|       |   |                               |
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| 12:30 | COLLECTIVE PICTURES OF THE PARTICIPANTS | IN FRONT OF THE SWIMMING POOL |
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| 12:30 – 14:00 | LUNCH (NO LUNCH PROVIDED) |
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| <b>18.06.2019</b><br><b>14:00 – 16:00</b>         |   | <b>SESSION “TRANSPORT TECHNIQUES. INVESTIGATION OF ELEMENTS. VEHICLE ENGINES”</b>  |  | <b>CONFERENCE HALL</b> |  |
| <b>CHAIRMAN: PROF. DSC. SEVOSTIAN BECHTA (SW)</b> |   |  | <b>CO-CHAIRMAN: PROF. DSC ALEKSANDAR MANOJLOVIC (RS)</b> |                        |  |
| <b>8</b>  | 1D SIMULATION-BASED DEVELOPMENT OF A SAFETY CONCEPT FOR THE INVESTIGATION OF A HIGH-PRESSURE GAS-DIESEL INJECTOR ON A SINGLE-CYLINDER RESEARCH ENGINE | Dr. Dimitrov D. <sup>1</sup> , Dipl.-Ing. Aßmus K. <sup>1</sup> , Dr. Redtenbacher C. <sup>1</sup> , Dr. Schubert-Zallinger C. <sup>2</sup><br>LEC GmbH (Large Engines Competence Center), Graz <sup>1</sup><br>Graz University of Technology, Graz <sup>2</sup> | 38   | AT                     |  |
| <b>9</b>  | ANALYSIS OF THE EFFECT OF PERIODIC PULSATIONS OF LIQUIDS FLOW ON THE HEAT TRANSFERRING IN A CHANNEL WITH DISCRETE ROUGHNESS                           | Dr. sc.ing. hab. prof. Dzelzitis E., Dr.sc.ing. Sidenko N.<br>Riga Technical University  | 30   | LV                     |  |
| <b>10</b>   | MULTISCALE MODELING OF SHORT FIBRE REINFORCED COMPOSITES AND IT’S RELATIONSHIP TO MODAL ANALYSIS OF MACHINERY PARTS                                   | Eng. Jarmil Vlach., Eng. Jan Steklý Ph.D.<br>IDIADA CZ a. s.   | 35   | CZ                     |  |
| <b>11</b>   | IDENTIFICATION OF THE MINOR CHEMICAL ELEMENTS IN THE EXHAUST EMISSIONS FROM DIESEL ENGINE VEHICLES  | Dr. Richard Viskup, M.Sc. Christoph Wolf, Prof. Dr. Werner Baumgartner<br>Institute of Biomedical Mechatronics – Johannes Kepler University Linz   | 36   | AT                     |  |
| <b>12</b>   | FINDING THE OPTIMAL COMPENSATOR CONTROL MATRIX IN THE LONGITUDINAL CHANEL FOR DEVELOPED MUAV  | M.Sc. Biliderov S. PhD. <sup>1</sup><br>Faculty of Aviation, Dolna Mitropolia – National Military University, Veliko Turnovo, Bulgaria   | 27   | BG                     |  |
| <b>13</b>   | APPROACH OF CALCULATING THE AUTOMOTIVE GASOLINE INJECTOR ELECTROMAGNETIC PARAMETERS   | Assoc.Prof. M.Sc. Bozhkov S. PhD.<br>Department of Transport Equipment, Todor Kableskov University of Transport  | 21   | BG                     |  |
| <b>14</b>   | STATISTICAL EVALUATION OF RESISTANCE SIDE FRAMES OF FREIGHT CARS WITH CRITICAL DEFECTS  | Associate Professor Elyazov Israil Shukur,<br>Azerbaijan Technical University  | 29   | AZ                     |  |
| <b>15</b>   | ELECTRONIC THROTTLE DEVELOPMENT FOR EXPERIMENTAL HYBRID-ELECTRIC VEHICLE  | Student Prodanović J., Prof. Dr Stojić B. <sup>1</sup> ,<br>University of Novi Sad   | 34   | RS                     |  |

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| <b>16:00 – 16:30</b> | <b>COFFEE BREAK - CONFERENCE BAR</b> |
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| <b>16:30 – 18:00</b> | <b>DISCUSSIONS</b> |
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| <b>19:30 – 24:00</b> | <b>“WELCOME” COCKTAIL - CONFERENCE BAR</b> |
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| TUESDAY<br>(18.06)   | 09:00 – 19:00  | POSTER SESSION   | CONFERENCE HALL |    |  |
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| WEDNESDAY<br>(19.06) | 09:00 – 13:00  | “TRANSPORT. SAFETY AND ECOLOGY.<br>LOGISTICS AND MANAGEMENT.<br>EDUCATION THEORY”  |                 |    |  |
| 16                   | NEW VEHICLES AS OUR REALITY  | Prof dr Nataša Tomić-Petrović,<br>University of Belgrade   | 02              | RS |  |
| 17                   | ENVIRONMENTAL IMPACT OF ELECTRIC VEHICLES  | Assistant Prof. Simeunović M. PhD.,<br>Associate Prof. Papić Z. PhD.,<br>Associate Prof. Simeunović M.,<br>M.Sc. Saulić N.<br>University of Novi Sad   | 07              | RS |  |
| 18                   | INTERACTION BETWEEN ROLLING STOCK AND RAILWAY TRACK WITH OF THE ELASTIC PROPERTIES OF THE BASE   | Prof. Dr. Myamlin S. <sup>1</sup> , Assoc. Prof. Dr. Bondarenko I. <sup>1</sup><br>Dnipropetrovsk National University of Railway Transport named after academician V. Lazaryan, Ukraine <sup>1</sup>   | 05              | UA |  |
| 19                   | THEORY OF FACTOR EXPERIMENT (MATRIX OF IMPACT) OF GREENHOUSE AS A COMPOSITION SYSTEM FOR BIOGAS PRODUCTION AND REGULATION FOR PERMISSIBLE EMISSIONS OF HARMFUL MATERIALS IN ATMOSPHERE | M.Sc. Veljanovski D <sup>1</sup> ., Prof. Jovanovska V. PhD <sup>1</sup> ., Jovanovska D <sup>2</sup> ., Prof. Hristovska E. PhD <sup>1</sup> .<br><sup>1</sup> University St. Clement Ohridski – Bitola,<br><sup>2</sup> Ss.Cyril and Methodius University in Skopje  | 09              | NM |  |
| 20                   | SOCIAL DEVELOPMENT MANAGEMENT OF AIRLINES IN UKRAINE   | Prof. DSc Zhavoronkova G. <sup>1</sup> , Assoc. Prof. DSc Shkoda T. N. <sup>2</sup> , Assoc. Prof. Dr. Zhavoronkov V. <sup>1</sup><br>National Aviation University <sup>1</sup><br>Kyiv National Economic University named after Vadym Hetman <sup>2</sup>   | 37              | UA |  |
| 21                   | FIRST AID TO THE VICTIMS OF ROAD ACCIDENTS IN THE EVACUATION PROCESS   | Prof. Dr. I. Nakashidze <sup>1</sup> , Prof. Dr. P.GogiaShvili <sup>2</sup> , Master of Medicine Sh. Potskhishvili <sup>3</sup> , Resident A.Kochadze <sup>4</sup> , Medicine student L.Chogovadze <sup>2</sup><br>Batumi Shota Rustaveli State University <sup>1</sup><br>Akaki Tsereteli state University <sup>2</sup><br>Medical Center Medina – Batumi <sup>3</sup><br>Tbilisi State Medical University <sup>4</sup> | 40              | GE |  |
| 22                   | INCREASED RISKS OF IMPACT ON THE ENVIRONMENT OF POTI AND KULEVI SEA PORTS  | Assoc.Prof. N. Kamkamidze, Assoc.Prof A, Gobejishvili, Assoc.Prof, N. Khazaradze, Assoc.Prof. N.Tsutskiridze, Assoc.Prof. L. Gamkrelidze<br>Akaki Tsereteli State University - Kutaisi,  | 43              | GE |  |
| 23                   | CO <sub>2</sub> EMISSIONS OF E-MOBILITY  | Prof. Lech J. Sitnik DSc. PhD<br>Faculty of Mechanical Engineering – Wroclaw University of Science and Technology  | 44              | PL |  |
| 24                   | TYPES OF MATERIALS USED FOR WINTER MAINTENANCE OF ROADS, EFFICIENCY AND INFLUENCE ON THE CORROSION OF ROAD FACILITIES  | mag. Eng. Nikolay Kyuchukov  | 49              | BG |  |
| 25                   | QUALITY CONTROL OF MULTI-PASS WELD BY MEANS OF ACOUSTIC EMISSION   | M Sc. Eng. Dmitry S. Bals <sup>1</sup> , M Sc. Eng. Leonid A. Vinogradov <sup>2</sup> , M Sc. Eng. Yulija Soldatova <sup>2</sup><br>TTS LNK INDUSTRIES <sup>1</sup> , Riga<br>Riga Technical University <sup>2</sup>   | 50              | LV |  |

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| 26 | REDUCING THE ENERGY INTENSITY OF MULTI-PRODUCT MACHINERY PRODUCTION BY IMPROVING THE CORE PRODUCTION INFRASTRUCTURE  | V.G. Abrahamyan<br>Russian-Armenian University<br>Ysrevan State University      | 51 | AM |
| 27 | THE RESEARCH PECULIARITIES OF PARAMETERS AND CHOICE OF AGRICULTURAL MACHINES IN PEDAGOGICAL TECHNOLOGIES FOR INNOVATIVE PROJECT ACTIVITY IN TRAINING AGROENGINEERS | Assoc. Prof. Dr. Viktor Pryshliak<br>Vinnytsia National Agricultural University | 53 | UA |

| <b>TUESDAY<br/>(18.06)</b>   |  | <b>09:00 – 19:00</b>  | <b>POSTER SESSION<br/>“TRANSPORT TECHNIQUES.<br/>INVESTIGATION OF ELEMENTS.<br/>VEHICLE ENGINES”</b> | <b>CONFERENCE HALL</b> |  |
|------------------------------|--|---|--|------------------------|--|
| <b>WEDNESDAY<br/>(19.06)</b> |  | <b>09:00 – 13:00</b>  |  |                        |  |
| 28                           | EVALUATION OF THE EFFICIENCY OF THE VEHICLE WITH VARIOUS INTER-WHEELED DIFFERENTIALS FOR DIFFERENT CLUTCH CONDITIONS ON SIDES IN ACCELERATION REGIME                             | Prof. DCs Volontsevych D., Cand. Sci, Assoc.Prof. Dr. Veretennikov Ie., Phd. Student Eng. Mormylo Ia., Phd. Student Eng. Karpov V., National Technical University "Kharkiv Polytechnic Institute", Kharkiv, Ukraine | 04   | UA                     |  |
| 29                           | NUMERICAL ANALYSIS OF IN-CYLINDER PRESSURE AND TEMPERATURE CHANGE FOR NATURALLY ASPIRATED AND UPGRADED GASOLINE ENGINE   | PhD. Mrzljak Vedran, Eng. Žarković Božica, Prof. PhD. Prpić-Oršić Jasna, PhD Student Eng. Anđelić Nikola University of Rijeka   | 06   | HR                     |  |
| 30                           | EXERGY ANALYSIS OF STEAM TURBINE GOVERNING VALVE FROM A SUPER CRITICAL THERMAL POWER PLANT   | PhD. Mrzljak Vedran <sup>1</sup> , PhD. Orović Josip <sup>2</sup> , PhD. Poljak Igor <sup>2</sup> , PhD Student Lorencin Ivan <sup>1</sup><br><sup>1</sup> University of Rijeka<br><sup>2</sup> University of Zadar | 08   | HR                     |  |
| 31                           | NORMS AND LEGAL REGULATIONS TO LIMIT TOXIC EMISSIONS FROM INTERNAL COMBUSTION ENGINES WHEN USING ALTERNATIVE FUELS AS ENVIRONMENTALLY ELIGIBLE IN RELATION OF CONVENTIONAL FUELS | M.Sc. Veljanovski D., Prof. Jovanovska V. PhD., Jovanovska D., Prof. Sovreski Z.V. PhD.<br>University St. Clement Ohridski – Bitola   | 10   | NM                     |  |
| 32                           | OBJECTIFICATION AND DETERMINATION OF HAND-ARMED VIBRATIONS   | doc. Ing. Michaela Balážiková, PhD. , doc. Ing. Marianna Tomašková, PhD. Technical University of Kosice   | 11   | SK                     |  |
| 33                           | FEATURES OF TRANSMISSIONS FOR HYBRID CARS  | PhD Student Georgi Tonkov Todor Kableshkov University of Transport  | 23   | BG                     |  |
| 34                           | A RESEARCH INTO THE EFFECT OF ATMOSPHERIC TURBULENCE ON THE MOTION OF A QUADROPTER WITH PID CONTROL  | M.Sc. Kambushev M. PhD.<br>National Military University, Veliko Turnovo   | 24   | BG                     |  |
| 35                           | ANALYSIS OF THE RELIABILITY OF DC BRUSHLESS ELECTRIC MOTORS WITH POWER UP TO 200W USED IN MAVS   | M.Sc. Kambushev K.M. PhD.<br>National Military University, Veliko Turnovo,  | 26   | BG                     |  |
| 36                           | EXPERIMENTAL AND NUMERICAL ANALYSIS OF WIND TURBINE MODEL  | Biluš I. PhD., Lešnik L. PhD.<br>University of Maribor  | 45   | SI                     |  |
| 37                           | SIMULATION OF THREE-DIMENSIONAL CAVITATION IN RADIAL DIVERGENT TEST SECTION USING DIFFERENT MASS TRANSFER MODELS   | Lešnik L. PhD., Biluš I. PhD.,<br>University of Maribor   | 46   | SI                     |  |
| 38                           | STUDY OF THE WORKFLOW OF A BUCKETLESS ROTARY LOADER BODY   | Nurakov S., Merzadinova G.T., Toulebekova A.S., Kaliyev A.B. E.N.Gumilyov Eurasian National University  | 47   | KZ                     |  |

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| 39 | METHODS TO IMPROVE THE RELIABILITY AND EFFICIENCY OF THE CONTROL SYSTEM OPERATION OF VEHICLES | Ph. D. Prof. Shatmanov O. T., Ph. D. prof Ganbarov J. G., senior teacher T. M. Asanaliev, PhD student Kojogulov M. A.<br>Kyrgyz state University of construction, transport and architecture named after N. Isanova, Bishkek. Kyrgyzstan<br>Kazakh Academy of transport and communications named after M. Tynyshpaeva Almaty. Kazakhstan | 52 | KG<br>KZ |
| 40 | BASIS OF DESIGN TRAFFIC ROUTES UNMANNED TRACKED VEHICLE                                       | Prof. Dsc. Derzhanskii V., Prof. Dsc. Taratorkin I., Ph.D. Volkov A., postgraduate Yakovlev A.<br>Institute of Engineering Science of the Ural Branch of the Russian Academy of Sciences (IES UB RAS), Russia  | 54 | RU       |

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| <b>19:30 – 24:00</b> | <b>“WELCOME” COCKTAIL - CONFERENCE BAR</b> |
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19.06.2019 (TUESDAY)

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| <b>10:00</b> | <b>CLOSING OF THE CONFERENCE WINE AND CHEESE PARTY</b> | <b>CONFERENCE BAR</b> |
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**NEXT CONFERENCE “trans & MOTAUTO 2020”**  
**22.06-25.06.2020, VARNA, HOTEL “AQUA AZUR”.**

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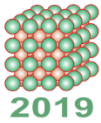
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IV INTERNATIONAL SCIENTIFIC CONFERENCE  
**CONSERVING SOILS AND WATER**

28-31.08.2019, BURGAS, HOTEL ATLANTIS  
[www.conserving-soils.eu](http://www.conserving-soils.eu)



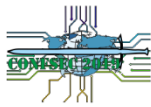
VI INTERNATIONAL SCIENTIFIC CONFERENCE  
**MATERIAL SCIENCE.  
NONEQUILIBRIUM PHASE TRANSFORMATIONS 2019**

09-12.09.2020, VARNA, HOTEL AQUA AZUR  
[www.material-science.eu](http://www.material-science.eu)



XVI INTERNATIONAL SCIENTIFIC CONGRESS - SUMMER SESSION  
**MACHINES. TECHNOLOGIES. MATERIALS 2019**

11-14.09.2019, VARNA, HOTEL AQUA AZUR  
[www.mtmcongress.com](http://www.mtmcongress.com)



III INTERNATIONAL SCIENTIFIC CONFERENCE  
**CONFSEC 2019**

09-12.12.2019, BOROEVETS, HOTEL ELA  
[www.confsec.eu](http://www.confsec.eu)



IV INTERNATIONAL SCIENTIFIC CONFERENCE - WINTER SESSION  
**INDUSTRY 4.0**

11-14.12.2019, BOROEVETS, HOTEL ELA  
[www.industry-4.eu](http://www.industry-4.eu)



III INTERNATIONAL SCIENTIFIC CONFERENCE  
**MATHEMATICAL MODELING**

11-14.12.2019, BOROEVETS, HOTEL ELA  
[www.mathmodel.eu](http://www.mathmodel.eu)



V INTERNATIONAL SCIENTIFIC CONFERENCE  
**HIGH TECHNOLOGIES. BUSINESS. SOCIETY 2020**

09-12.03.2020, BOROEVETS, HOTEL ELA  
[www.hightechsociety.eu](http://www.hightechsociety.eu)



XIII CONFERENCE FOR YOUNG RESEARCHERS  
**TECHNICAL SCIENCES. INDUSTRIAL MANAGEMENT 2020**

11-14.03.2020, BOROEVETS, HOTEL ELA  
[www.youngconference.com](http://www.youngconference.com)



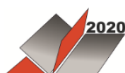
XVII INTERNATIONAL SCIENTIFIC CONGRESS - WINTER SESSION  
**MACHINES. TECHNOLOGIES. MATERIALS 2020**

11-14.03.2020, BOROEVETS, HOTEL ELA  
[www.mtmcongress.com](http://www.mtmcongress.com)



XXVII INTERNATIONAL SCIENTIFIC-TECHNICAL CONFERENCE  
**FOUNDRY 2020**

08-10.04.2020, PLEVEN, HOTEL ROSTOV  
[www.metalcasting.eu](http://www.metalcasting.eu)



VIII INTERNATIONAL SCIENTIFIC CONFERENCE  
**ENGINEERING. TECHNOLOGIES. EDUCATION. SECURITY 2020**

27.05-30.05.2020, VELIKO TARNOVO, HOTEL ASENEVTSI  
[www.techtos.net](http://www.techtos.net)



**Пришляк В.М.**

**Доповідь**

**THE RESEARCH PECULIARITIES OF PARAMETERS AND CHOICE OF  
AGRICULTURAL MACHINES IN PEDAGOGICAL  
TECHNOLOGIES FOR INNOVATIVE PROJECT ACTIVITY IN  
TRAINING AGROENGINEERS**

The structural-logical model of training of future specialists in agroengineering for innovative project activity has been developed on the basis of a systematic comprehensive study of the theoretical course of agricultural machines, the deepening of the students' scientific work on the development of supporting and moving elements of machine-tractor units, including pneumatic tires. The samples of individual fragments from the algorithm and the method of calculation of wheels used in the educational process are provided and the general and professional competencies of the agroengineer are created, especially during the implementation of future specialists in agro-industrial production of higher education courses in the course of master's and master's studies. It is noted that the training of agroengineers for innovative project activities is carried out in accordance with the Law of Ukraine "On Higher Education" and the standards of higher education of Ukraine. The influence of interdisciplinarity in the system of cross-cutting project preparation on the readiness for implementation of production practical tasks is investigated. It is confirmed that the support-run elements of aggregates in the conditions of complex terrain contributes to the development of erosion processes and negatively affect the soil fertility. Any tire better satisfies the condition of permissible wheel pressure on the soil if the air pressure in the tire is low. Improving the technological process of manufacturing tires for agricultural purposes allows them to ensure their quality, reliability and operational safety.

Science and education are closely interconnected and able to develop effectively in a single integrated system of scientific, methodological and pedagogical activities. Educational process is an intellectual, creative activity of scientific and pedagogical workers, students, practitioners and other interested subjects in the sphere of higher education and science [1].

The training of future agroengineers is based on the formation of professional competences in a harmoniously developed personality capable of solving various tasks of production activity. The object of the study and activities of the agroengineer are the phenomena and processes associated with the effective functioning of agricultural machinery and mechanized technologies in agro-industrial production [2]. The educational process of students of the specialty "Agroengineering" is aimed at training specialists capable of solving professional specialized tasks and applied problems related to the use of agricultural machinery in mechanized production technologies, primary processing, storage and transportation of agricultural products, technical service of mechanization facilities, etc.

In the structural and logical scheme of training future agroengineers, the basic discipline is "Agricultural machines", students learn about the structure and principle of operation of agricultural machines, regulation and adjustment of them for optimal modes of work, as well as the theoretical basis of technological processes of working bodies, the method of development and designing new and improving existing structures [3]. Studying discipline in addition to classroom activities involves the independent performance of course work, the purpose of which is the technological development of the design of agricultural machinery or its units, or the improvement of existing machines to ensure the implementation of mechanized production processes of growing crops and improving the operational, economic and environmental performance.

The main scientific directions of the master's work in the field of agroengineering are to increase the productivity of aggregates, expand their versatility, combine energy resources with other implements and ensure their reliable handling, minimize the negative impact on the environment and soil, improve the working conditions of machinery, as well as traffic safety. Agricultural machine-tractor aggregates are driven across the field by overwhelming majority by means of a wheeled driving system. The processes that occur when the wheels interact with the soil, affect not only the performance of the machines, but also the properties of the soil, as the object of cultivation and the environment of cultivating crops.

Practical, scientific and educational activities show that the problem issues on the peculiarities of the substantiation of parameters and the choice of tires of agricultural

machinery wheels in pedagogical technologies of agroengineering training for innovative project activities are still insufficiently studied and require further fundamental theoretical and experimental studies, scientific substantiation and generalizations.

For a long time, scientists have been engaged mainly in the study of the processes of interaction of the running system with the soil and traction-coupling properties of machines. Regarding the deformation of pneumatic tires of agricultural wheels, these issues are not sufficiently studied.

The problem issues related to the design of agricultural machinery, preparation of agroengineering specialists for the project activity, including the features of substantiation of parameters and selection of tires of wheels, are not sufficiently studied.

In [4], the main components of the preparedness for the project activity of the agroengineer as a specialist are presented, which are united in physical and mathematical, general technical and special blocks and general and professional competences, which should be mastered by the bachelor of specialty 208 "Agroengineering". For example: to design equipment and equipment of production areas, agricultural machines, their knots, mechanisms, various connections; carry out standard design calculations of knots and parts of machines and non-standard equipment; rational assembly of machine aggregates in existing production lines of crop and livestock production; to determine the technical condition of tractors, cars and aggregates of complex equipment [2], to optimize transport processes, etc.

In [5] presented an innovative system of scientific and methodological developments that affect the formation of special professional competencies of agroengineering. The basis of this system is the latest textbooks, manuals, monographs, programs and other teaching materials, as well as advanced pedagogical technology of training, which is based on the progressive, phased development of the future specialist's readiness for the project activity. Such pedagogical technology of training provides a comprehensive, comprehensive formation of professional competencies of agroengineering in accordance with regulatory requirements and standards of education, including [1, 2]. Students' scientific activity, which is based on the development and modernization of agricultural machinery, plays an important role in the design training. It was noted [5] that the first voluminous work of the student in the educational process is the course work on the

discipline "Agricultural Machines". Its successful implementation is a solid ground for effective and effective graduate design, writing master's thesis.

The general issues of the theory of design training were studied deeply by: Bryukhanova N.O. [6], Kolesnikova IA [7], Gorchakov-Siberian MP [7], Nychalko N.G. [8], Zyazun I.A. [8], Goncharenko S.U. [8] et al. The theory, methodology and practice of design training for agroengineering, including in view of the design of agricultural machinery, were studied and investigated: Bendera I.M. [9, 10, 11], Duganets V.I. [12], Pryshliak V.M. [4, 5, 13] and others. Also, the questions of improving the methodology of preparing future engineers are devoted to the work of A. Asherova, O. Kovalenko, M. Lazareva, D. Chernilevsky, P. Yakovyshina, and the methodological aspects of the future of agroengineering have been reflected in the scientific researches of I. Buzik, A. Demin, S. Daukilas, A. Esaulov, P. Luzan, V. Manke, I. Palamara, S. Pastushenko, V. Yaroshenko, transformation of independent educational activity into readiness for professional self-development by means of technologies of personally oriented education – is reflected in the monograph Bond p NN Zhuravsky LM Ostapenko EO, Przyszlak V.M., Kutsenko AG [14].

Actual issues of studying the design, operation of tires, reducing the harmful effects of the effect of running systems of the machine tractor unit on the soil are devoted to the work [15, 16, 17, 18], and their production – [18, 19].

As noted in [5], the theory and practice of project preparation for future agroengineering involves the widespread use of a scientific component in the educational process during classroom classes, independent work of students. The scientifically substantiated cross-cutting, interdisciplinary, sequential and phased development of agricultural machinery involves achieving a high quality learning outcomes and innovative technology development. Apart from the fact that students during their studies at the institution of higher education take part in research processes, conferences, construct and model the means of mechanization, they are to complete the term paper at the 3rd year, and in the master's degree - a master's degree. Here, students mainly count, design and study the working bodies of agricultural machines. However, there are works in which auxiliary but very important nodes, mechanisms or systems of machines are presented.

The same applies to the support and running elements of agricultural machines, including wheel tires.

The type of wheel tires of agricultural machines should be selected, taking into account the permissible action of the wheels on the soil. Preferably the ecological pressure limit of the wheels on the soil, depending on its type and state, is taken at a pressure of 0,1-0,15 MPa.

First, for one of the circuits [3], it is necessary to determine the radial load of the wheels on the soil (kN), which will correspond to the required lifting capacity of the wheels of the machine, using the formulas:

After conducting such an example of theoretical studies, graduates begin to create a laboratory installation and conduct experimental research in laboratory or field conditions.

As a result of scientific research, a pedagogical system was developed, basing on the example of the interaction of the supporting and moving elements of machine-tractor units with soil and on the consistent study of topical production issues, contributes to the improvement of the quality of training and the development of design competencies of the agroengineer.

. The developed innovative system of scientific and methodological training of future specialists is based on a planned, cross-cutting, step-by-step growth of knowledge, skills and abilities of future agroengineering. Course designing and master's work provide a qualitative growth in the design competencies of the graduate.

The obtained results of the conducted research give grounds to conclude that an effective process of formation of readiness for the project activity of future specialists in agroengineering is possible on the basis of cross-cutting innovative teaching technologies. Coursework and master's work contribute to the development of scientific activities. It is important that they have practical orientation, since this will substantially motivate the students to complete them.





**SCIENTIFIC AND TECHNICAL  
UNION OF MECHANICAL ENGINEERING  
BULGARIA  
AWARDS**

**A**

**DIPLOMA**

**FOR THE PARTICIPATION IN THE  
XXVII  
INTERNATIONAL SCIENTIFIC CONFERENCE**

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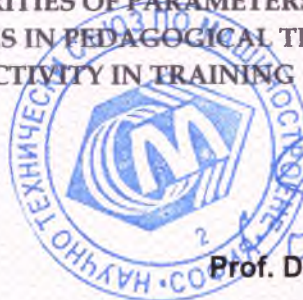
**TO**

*Candidate of Tech. Sc., Assoc. Prof.*

*Pryshliak V.*

**FOR THE REPORT**

**THE RESEARCH PECULIARITIES OF PARAMETERS AND CHOICE OF  
AGRICULTURAL MACHINES IN PEDAGOGICAL TECHNOLOGIES FOR  
INNOVATIVE PROJECT ACTIVITY IN TRAINING AGROENGINEERS**



**Prof. D.SC. Eng. Georgi Popov  
Chairman of the**

**Scientific-Technical Union of Mechanical Engineering**

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