

## PROGRAMME COMMITTEE

- **Prof. Velizara Pencheva, PhD,**  
University of Ruse, Bulgaria
- **Prof. Leon Rothkrantz**  
Delft University of Technology, Netherlands
- **Assoc. Prof. Antonio Jose Mendes,**  
University of Coimbra, Portugal
- **Prof. Ville Leppanen,**  
University of Turku, Finland
- **Assoc. Prof. Marco Porta,**  
University of Pavia, Italy
- **Prof. Douglas Harms,**  
DePauw University, USA
- **Prof. Ismo Hakala, PhD,**  
University of Jyväskylä, Finland
- **Prof. Dr. Artur Jutman,**  
Tallinn University of Technology, Estonia
- **Prof. RNDr. Vladimír Tvarozek, PhD,**  
Slovak University of Technology in Bratislava, Bratislava, Slovakia
- **Doc. Ing. Zuzana Palkova, PhD,**  
Slovak University of Agriculture in Nitra, Nitra, Slovakia
- **Andrzej Tutaj, PhD,**  
AGH University of Science and Technology, Krakow, Poland
- **Assoc. Prof. Behiç TEKİN, PhD,**  
EGE University, Izmir, Turkey,
- **Prof. Valentin NEDEFF Dr. eng. Dr.h.c.,**  
“Vasile Alecsandri” University of Bacău, Romania
- **Dr. Cătălin POPA,**  
“Mircea cel Bătrân” Naval Academy, Constantza, Romania
- **Prof. dr Larisa Jovanović,**  
Alfa University, Belgrade, Serbia
- **Prof. dr hab. Edmund LORENCOWICZ,**  
University of Life Sciences in Lublin, Poland
- **Assoc. Prof. Ion MIERLUS - MAZILU, PhD,**  
Technical University of Civil Engineering, Bucharest, Romania
- **Prof. Dojčil Vojvodić PhD,**  
Faculty of Philosophy, University of Novi Sad, Serbi
- **Assoc. Prof. Alexandrache Carmen, PhD,**  
Department of Teacher Training, “Dunarea de Jos”, Galati University, Romania
- **Prof. Alberto Cabada,**  
University of Santiago de Compostela, Faculty of Mathematics, Santiago de Compostela, Spain
- **Assoc. Prof. Dr. Mehmet Şahin,**  
Necmettin Erbakan University, Ahmet Keleşoğlu Faculty of Education, Konya, Turkey
- **Assoc. Prof. Erika Gyöngyösi Wiersum, PhD,**  
Eszterházy Károly University, Comenius Campus in Sárospatak, Institute of Real Sciences, Sarospatak, Hungary
- **Anna Klimentova, PhD,**  
Constantine the Philosopher University in Nitra, Slovakia
- **Prof. Igor Kevorkovich Danilov, DSc,**  
Yuri Gagarin State Technical University of Saratov, Russia
- **Prof. Aleksander Valentinov Sladkowski, DSc,**  
Silesian University of Technology, Poland
- **Prof. Pether Shulte, PhD,**  
Institute for European Affairs (INEA), Dusseldorf, Germany

- **Prof. Aslitdin Nizamov, DSc., PhD,**  
Bukhara Engineering-Technological Institute, Bukhara, Uzbekistan
- **Prof. Marina Sheresheva, PhD,**  
Lomonosov Moscow State University, Russia
- **Prof. Erik Dahlquist, PhD,**  
Mälardalen University, Sweden
- **Prof. Erik Lindhult, PhD,**  
Mälardalen University, Sweden
- **Prof. Annika Kunnasvirta, PhD,**  
Turku University of Applied Sciences, Finland
- **Prof. Walter Leal, Dr. (mult.) Dr.h.c. (mult.),**  
Hamburg University of Applied Sciences, Germany
- **Prof. Dr. Gerhard Fiolka,**  
University of Fribourg, Switzerland
- **Prof. Haluk Kabaalioglu, PhD,**  
Yeditepe University, Turkey
- **Prof. Silva Alves, PhD,**  
University of Lisbon, Portugal
- **Hanneke van Bruggen,**  
Appeldoorn, The Netherlands
- **Nino Žganec,**  
President of European Association of Schools of Social Work, Prof. at the Department of Social Work,  
University of Zagreb, Croatia
- **Prof. Violeta Jotova,**  
Направление „Педиатрия“ в УМБАЛ „Св. Марина“ – Варна, България
- **Prof. Tanya Timeva, MD, PhD,**  
Obstetrics and Gynecology Hospital "Dr. Shterev", Sofia, Bulgaria
- **Prof. Kiril Stoychev, PhD,**  
Institute of Metal Science, Equipment and Technologies “Acad. A. Balevsci” with Hydroaerodynamics  
centre – BAS, Bulgaria
- **Assoc. Prof. Mark Shamtsyan, PhD,**  
Technical University, Saint Petersburg, Russia
- **Assoc. Prof. Oleksii Gubenia, PhD,**  
National University of Food Technology, Kiev, Ukraine
- **Assoc. Prof. Olexandr Zaichuk, DSc,**  
Ukrainian State University of Chemical Technology, Dnepropetrovsk, Ukraine
- **Prof. Eugene Stefanski, DSc,**  
Samara University, Russia
- **Doc. Dr. Tatiana Strokovskaya,**  
International University of Nature “Dubna”, Dubna, Russia
- **Prof. DSc. Petar Sotirov,**  
Maria Curie-Sklodowska University of Lublin, Poland
- **Prof. Papken Ehasar Hovsepiyan,**  
Sheffield Hallam University, Sheffield, UK
- **Accos. Prof. Krassimir Dochev Dochev, PhD,**  
University of Portsmouth School of Engineering, UK
- **Mariana Yordanova Docheva, PhD,**  
University of Portsmouth School of Engineering, UK
- **Assoc. Prof. Ivan Antonov Lukanov, PhD,**  
University of Botswana, Faculty of Engineering and Technology, Gaborone, Botswana
- **Assoc. Prof. Petko Vladev Petkov, PhD,**  
Research Associate Cardiff University, UK
- **Prof. Stepan Terzian DSc,**  
Bulgarian Academy of Science, Bulgaria
- **Prof. Dr. Gabriel Negreanu,**  
University Politehnica of Bucharest, Romania

## ORGANISING COMMITTEE

- ◆ **ORGANIZED BY: UNIVERSITY OF RUSE (UR) AND UNION OF SCIENTISTS (US) - RUSE**
- ◆ **ORGANISING COMMITTEE:**
  - **Chairperson:**  
COR. MEM Prof. Hristo Beloev, DTSc – Rector of UR, Chairperson of US - Ruse
  - **Scientific Secretary:**  
Prof. Diana Antonova PhD, Vice-Rector Research,  
dantonova@uni-ruse.bg, 082/888 249
  - **Members:**
    - Prof. Veselin Grigorov, DTSc
    - Prof. Vladimir Chukov, PhD, DSc
    - Prof. Juliana Popova, PhD
    - Assoc. Prof. Kaloyan Stoyanov, PhD
    - Assoc. Prof. Tsvetan Dimitrov, PhD
    - Assoc. Prof. Nastya Ivanova, PhD
    - Assoc. Prof. Kiril Sirakov, PhD
    - Assoc. Prof. Milko Marinov, PhD
    - Assoc. Prof. Simeon Iliev, PhD
    - Assoc. Prof. Pavel Vitliemov, PhD
    - Assoc. Prof. Mimi Kornazheva, PhD
    - Assoc. Prof. Emilia Velikova, PhD
    - Assoc. Prof. Juliia Doncheva, PhD
    - Assoc. Prof. Stefka Mindova, PhD
    - Assoc. Prof. Sasho Nunev, DSc of SW
    - Assoc. Prof. Despina Georgieva, PhD
    - Assoc. Prof. Elitsa Kumanova, PhD
    - Assoc. Prof. Emil Trifonov, PhD
    - Pr. Assist. Krasimir Koev, PhD
    - Pr. Assist. Hristina Sokolova, PhD
    - Pr. Assist. Magdalena Andreeva, PhD
    - Pr. Assist. Reneta Zlateva, PhD
    - Pr. Assist. Velislava Doneva, PhD
    - Pr. Assist. Elena Ivanova, PhD
    - Senior Lecturer: Viliyana Raycheva
    - Assist. Prof. Milen Sapundzhiev, PhD student
    - Boryana Stancheva, PhD student
    - Daniela Todorova

◆ **REVIEWERS:**

Prof. Nikolay Zlatov, PhD

Prof. Branko Sotirov, PhD

Prof. Ivelin Ivanov, PhD

Assoc. Prof. Petko Petkov, PhD

Assoc. Prof. Ivan Lukanov, PhD

Assoc. Prof. Rusi Minev, PhD

Assoc. Prof. Krasimir Ivanov, PhD

Assoc. Prof. Boris Sakakushev, PhD

Assoc. Prof. Rosen Radev, PhD

Assoc. Prof. Danail Gospodinov, PhD

Assoc. Prof. Dimitar Dimitrov, PhD

Assist. Prof. Svetlana Koleva, PhD

## MECHANICAL ENGINEERING AND MACHINE-BUILDING TECHNOLOGIES

### Content

1. <b>FRI-1.417-1-MEMBT-01</b> <b>Vibration Steering of a Vibration-Driven Mobile Robot</b> <i>Ivan Loukanov, Venko Vitliemov, Ivelin Ivanov, Yilian Angelov</i>	9
2. <b>FRI-1.417-1-MEMBT-02</b> <b>Overview of the Feasibility of Simulating Welding Processes Using the Finite Element Method</b> <i>Ivo Draganov, Yulian Angelov, Stiliyana Mileva</i>	18
3. <b>FRI-1.417-1-MEMBT-03</b> <b>Dissolution and Mechanical Properties of 3D Printed Polylactic Acid for Bio-Implants</b> <i>Mariana Ilieva, Dimitar Kamarinchev, Danail Gospodinov, Ekaterin Minev, Emil Yankov, Roussi Minev</i>	24
4. <b>FRI-1.417-1-MEMBT-04</b> <b>Influence of the Variable Character of Anizotropy on the Hardening Curves in Hydraulic Bulging Test of Copper Sheet</b> <i>Emil Yankov</i>	26
5. <b>FRI-1.417-1-MEMBT-05</b> <b>Models for Investigating Nonlinearity Errors of Static Characteristics</b> <i>Dimitar Dichev, Fotini Kogia, Hristo Hristov, Tsanko Karadzhov</i>	36
6. <b>FRI-1.417-1-MEMBT-07</b> <b>About the Information Assurance of Technological Processes by Machining Parts</b> <i>Svetlana Koleva, Milko Enchev, Emil Belyov</i>	45
7. <b>FRI-1.417-1-MEMBT-08</b> <b>Problems During Highly Productive Complex Quality Assessment of Objects</b> <i>Tihomir Todorov, Deniz Chakar</i>	51
8. <b>FRI-1.417-1-MEMBT-09</b> <b>Examination of Crane Booms about their Propensity for Vibration in Mechanical Machining</b> <i>Nikolay Nikolov</i>	55
9. <b>FRI-1.417-1-MEMBT-10</b> <b>Experimental Research Facility for Preliminary Research of Measurement Method with 3D Touch Probe by Touch Signal</b> <i>Valentin Mihov</i>	60

- |     |   |    |
|-----|---|----|
| 10. | <b>FRI-1.417-1-MEMBT-11</b><br><b>Modeling and Investigation of Inertial Tamping Machine</b><br><i>Ivelin Ivanov, Svetlin Stoyanov</i>                      | 65 |
| 11. | <b>FRI-1.417-1-MEMBT-12</b><br><b>Testing the Precision of the Mechanism for Measuring The Liquid Level</b><br><i>Mladen Petrov</i>                         | 73 |
| 12. | <b>FRI-1.417-1-MEMBT-13</b><br><b>Application of the Taguchi–Metodology for Data Analysis from Marketing Survey</b><br><i>Mladen Petrov</i>                 | 78 |
| 13. | <b>FRI-1.417-1-MEMBT-06</b><br><b>Energy Consumption and Energy Efficiency of Machine Tools – an Overview</b><br><i>Krasimir Ivanov, Borislav Tonkovski</i> | 83 |