

# Table of Contents

## Preface, Conference Committee and the Topics and Presidents

## Chapter 1: Engineering of Manufacturing Processes

<b>Improving of the Functional Parameters from Water Stations</b> A. Alexandrescu and S.A. Miron	3
<b>A Study on Plastic Deformations due to Contact Fatigue Wear on a Metallic Coating Deposited in Electric Arc</b> G.N. Bănescu, I.V. Crîmaru, S.I. Strugaru, A.C. Bărbîntă, A. Bârcă and C. Munteanu	9
<b>Failure Mode and Effects Analysis on Control Equipment Using Fuzzy Theory</b> N. Belu, D.C. Anghel and N. Rachieru	16
<b>Profiling Method of Side Mill for Threading Screw for Dental Implants</b> S. Berbinschi, N. Baroiu, V. Teodor and N. Oancea	22
<b>Optimum Tool Life and Cutting Speed for the Maximum Productivity at the Drilling of the Steel X6CrNiTi18-10</b> O. Blăjină, A. Vlase and V. Darie	28
<b>Analysis of Surface Roughness for High Speed Milling of a Magnesium Alloy Part</b> B. Chirita and N.C. Tampu	33
<b>Aspects of Transport Optimization in Holonic Enterprise</b> M.E. Ciortea	39
<b>Process Smoothing of the Inner Surface of Cylinders after Honing and its Role in Eliminating Wear in the Activation of the Heat Engine</b> D. Chirita	43
<b>Some Peculiarities of the Redundant Design Solutions</b> A. Gonçalves-Coelho, G. Neştian, M. Caviqho and A. Mourão	49
<b>Simulation of Arc Welding Process</b> V. Cohal	55
<b>Technique Achievement of Glass Objects Using Kiln Casting Method</b> C. Neagu-Cogălniceanu	61
<b>Contributions on Design and Accomplishing of the Whirling Thread Cutting Devices that could be Adapted for Ordinary Lathes</b> G. Creţu	67
<b>Research Concerning the Cold-Hardening of the Teeth of a Toothed Gear at Cold Teething by Intermittent Blow</b> I. Dobrescu and I. Banu	71
<b>Intelligent Collaborative Platform for Testing a Product by Virtual Prototyping</b> C. Dobrin and M. Cioca	77
<b>Studies on the Hydrodynamic Flow through the Cylinder Valve</b> D. Florescu and I. Florescu	84
<b>The Methods to Study the Influence of the Clearance in the Case of Great Speeds and Small Speeds</b> J.C. Grigore	88
<b>Influence of Tool - Semi-Product Friction on the Force Evolution at the Simulation of the Deformation Process with Flat Wedge Tools</b> D. Iacomi, M. Iordache, E. Niţu and S. Tabacu	93
<b>Mechanical and Geometrical Characterization of the Conveyors Belts from Mineral Resources Exploitation</b> A.C. Ianăşi and N.M. Mihuţ	99
<b>Recovery of Precious Metals from Catalytic Converters of Automobiles by Hydrometallurgical Solid-Liquid Extraction Processes</b> S. Ilie, A. Miutescu, M. Stoianovici and G. Mitran	105
<b>Determination of Constitutive Equation at the Deformation of Materials Using the Compression Test</b> M. Iordache, E. Niţu and D. Iacomi	110

<b>Estimation of Reliability Characteristics in a Production Scheduling Model with Failures and Time-Changing Parameters Described by Gamma and Exponential Distributions</b> W.M. Kempa, I. Paprocka, K. Kalinowski and C. Grabowik	116
<b>Installation for Determining the Nature of Excavated Material from the High-Capacity Belts of Mining Basins</b> N.M. Mihuț and A.C. Ianăși	122
<b>Influence of Cutting Parameters on the Surface Quality of Round Parts Made from AZ61 Magnesium Alloy and Machined by Turning</b> G. Mustea and G. Brabie	128
<b>The Influence of Burnishing Parameters on the Surface Quality of Bars Made from AZ61 Magnesium Alloy</b> G. Mustea and G. Brabie	135
<b>Aspects Regarding the Hybrid Models in Engineering</b> E. Oanta and C. Panait	141
<b>The Study of Compression Engine Cycle Behavior in Terms of Variable Gazodynamic and Geometrical Configuration. Regime of the Maximum Economy</b> I. Omocea	147
<b>Quality Oriented Self-Optimizing Control in Smart Machining Systems</b> H.S. Park and N.H. Tran	152
<b>Issues Concerning Vibrations Reduction of the Industrial Drilling Machine in the Manufacturing Processes</b> M.M. Pasăre and A.C. Ianăși	158
<b>Grapho-Analytical Determination of the Profile Disc Tool for Manufacturing of Complex Helicoidal Surfaces</b> G. Pleșu	164
<b>The Influence of Complex Dynamic Phenomena Caused by Wind Action on Behaviour of Transportation Pipelines</b> G. Pintilie	170
<b>Comparative Analysis of Different Methods in Residual Stress Measurement for Polymeric Parts</b> A. Raicu	175
<b>Analysis of the Linear Positioning Accuracy on Z Axis at the Horizontal Machining Centre TMA-AL-550</b> C. Bungău, R. Pancu and T. Buidosș	179
<b>Thermal Runaway of the <math>\text{BaCO}_3 + \text{Fe}_2\text{O}_3</math> Homogenous Mixture and Mechanical Alloys at the Microwave Heating</b> I.D. Savu, S.V. Savu and G.C. Benga	185
<b>Thermal Analysis to Evaluate Ageing Process in Heated Tool and Electrofusion Welding of Polymer Pipes</b> S.V. Savu, I.D. Savu and I. Ciupitu	190
<b>The Influence of the Feed Rate on the Quality of Surfaces Processed by AWJ at High Pressures</b> C. Schnakovszky, E. Herghelegiu, C. Radu and I. Cristea	196
<b>The Metal Sheets Processed by AWJ. Analysis of the Surface Quality</b> C. Schnakovszky, E. Herghelegiu and N.C. Tampu	201
<b>Studies Regarding Production of the Moulding Form from Calcined Gypsum</b> G. Simionescu and M. Gheorghian	206
<b>Researches for the Optimization of the Dehydration Process for Plums and Apricots</b> I. Tenu, R. Rosca, P. Cârlescu and I.D. Veleșcu	212
<b>Modular Tooling System for Ultrasonic Assisted Cutting</b> C.G. Turc, G. Belgiu and C. Cărbău	218
<b>Fuzzy Logic Applications in Flanges Manufacturing</b> C.G. Turc and G. Belgiu	223
<b>Smart Engineering and Energy Saving Management in Edible Oil Processing Technology and Speciality Fats Industrial Application</b> I. Vintila	228
<b>Improved Model to Determine the Tool Life and the Cutting Speed for Minimum Cost at Drilling the Steel 10TiMoNiCr175</b> A. Vlase, O. Blăjină and V. Darie	234

## Chapter 2: Advanced in Composite Materials and Technologies

<b>Protective Coatings on Carbon Steel</b> M.L. Barhalescu	241
<b>Comparison of Corrosion Behavior of Thin Layers from Copper, Aluminum and Chromium</b> M.L. Barhalescu	247
<b>Researches Concerning Stabilized Aluminium Foams Based on Silicon Carbide</b> O. Bălătescu, R.M. Florea, A. Buzăianu, C. Roman and I. Carcea	253
<b>A Comparative Analysis of New Ti-Nb-Zr-Ta Orthopedic Alloys</b> A.C. Bărbînță, R. Chelariu, M. Benchea, C.I. Crimu, S.I. Strugaru and C. Munteanu	259
<b>New Composite Materials that Reduce the Effect of Reinforcement Corrosion</b> V. Constantinescu, G.V. Bogus, R.G. Taran and I. Carcea	265
<b>Application of New Synthesized Materials Based on Anionic Clays for Industrial Effluent Decoloration</b> L. Dartu, C. Zaharia and G. Carja	271
<b>Research on Electromagnetic Properties of High Entropy Alloys</b> I. Florea, R.M. Florea, O. Bălătescu, V. Soare, C. Roman and I. Carcea	277
<b>Investigation Techniques of <i>In Situ</i> AlMg/AlN Metal Matrix Composites via Reactive Gas Injection</b> R.M. Florea, O. Bălătescu, A. Buzăianu and I. Carcea	283
<b>Abrasive Wear of Fibre-Metal Composites Based on Fibreglass Woven Fabric Layer</b> S. Zolkiewski	290
<b>Mechanical Properties of Fibre-Metal Composites Connected by Means of Bolt Joints</b> S. Zolkiewski	296

## Chapter 3: Characterization, Modeling and Simulation of Mechanical Processes

<b>FEA Study on the Elastic Deformation Process of a U-Shape Bimetal Actuator</b> M. Aignătoaie	305
<b>A Matlab Neural Network Application for the Study of Working Conditions</b> D.C. Anghel, A. Ene and N. Belu	310
<b>The Stress Distribution of a Layered Contact Cam Mechanism Using Finite Element</b> G.N. Bănescu, I.V. Crîmaru, S.I. Strugaru, C. Paulin, E.S. Bârcă and C. Munteanu	316
<b>Simulation and Performance Analysis of a FMS/CIM Using Stochastic Timed Petri Nets</b> D. Coman and A. Ionescu	322
<b>Design and Manufacturing Preparation of a Patient Specific Acetabular Cage</b> S. Costin and C.A. Micu	328
<b>Real-Time Monitoring Station for Production Systems</b> G. Ćwikła	334
<b>3D Conductive Textile Shields</b> C. Donciu	340
<b>Use of Finite Element Method in Optimization of Quay Crane's Grab</b> C. Dragomir	346
<b>Geometric Analysis of Motions Exercised by the Stewart Platform</b> A. Dymarek, T. Dzitkowski, K. Herbuś, G. Kost and P. Ociepa	351
<b>The Inverse Problem of Kinematics as the Tool for Determination of Motion Trajectories Exercised by Worm Drives of a Stewart Platform</b> A. Dymarek and T. Dzitkowski	357
<b>Synthesis of Constructive-Functional Parameters to Improving the Dynamic Behavior of Automatic Mechanisms</b> G.A. Stelian, L. Topliceanu and L. Bibire	363
<b>UML Models of Design and Knowledge Representation for Technical Production Preparation Needs</b> C. Grabowik, K. Kalinowski, I. Paprocka and W.M. Kempa	369

<b>Analysis of Simulated Welding Thermal Cycles S700MC Using Thermal Imaging Camera</b> J. Górka	375
<b>About Variability of Using of Methods of the Shape Identification Based on Geometrical Correlation</b> I. Gostev	381
<b>A Survey on Capp Systems Development Methods</b> C. Grabowik, K. Kalinowski, W.M. Kempa and I. Paprocka	387
<b>Virtual Analysis of the Mining Support under Loads of the Roof</b> A. Gwiazda	393
<b>The Aid of a Mistake Proofing with the use of Mechatronic Systems According to the Poka-Yoke Methodology</b> M.P. Hetmańczyk and P. Michalski	399
<b>The Self-Excitation Phenomenon of Quasi Shielded Inductive Proximity Switches</b> P. Michalski and M.P. Hetmańczyk	405
<b>Aspects Concerning the Dynamics of the Mechanisms with Clearances</b> J.C. Grigore	411
<b>The Model of Discrete Production Scheduling System in UML Notation - Classes Diagrams</b> K. Kalinowski, C. Grabowik, I. Paprocka and W.M. Kempa	416
<b>The Graph Representation of Multivariant and Complex Processes for Production Scheduling</b> K. Kalinowski, C. Grabowik, W.M. Kempa and I. Paprocka	422
<b>Theoretical and Data-Based Mathematical Model of a Special Vehicle Braking System</b> M. Marinescu, R. Vilau, M. Truta, V. Vinturis and O. Fieraru	428
<b>A Method to Obtain a Generalized Model of the Pressure Evolution within the Braking System of a Vehicle</b> M. Marinescu, R. Vilau, M. Truta and O. Fieraru	434
<b>Original Computer Based Solutions in Structural Studies</b> E. Oanta	440
<b>Analysis of Compression Ignition Engine Cycle Based on Irreversible Thermodynamics</b> I. Omocea	446
<b>A Dynamic Model of the Human Body in the Vertical Direction</b> M. Pîcu	452
<b>Assessment of a Traction Model for Agricultural Tires Based on a Variable Shear Area Model and Experimental Data</b> R. Rosca, P. Cârlescu and I. Tenu	458
<b>Short Term Prediction of Hydroelastic Dynamic Response in Random Waves for an 1100 TEU Container Ship</b> I. Rubanenco and L. Domnisoru	464
<b>Transient Regimes Analysis for a Diesel Engine</b> A. Sabau	471
<b>Pressure Waves Simulation in Diesel Engine Injection System</b> A. Sabau	477
<b>Longitudinal Loop Power Flow Analysis on a 4x4 Transmission Vehicle Taking into Consideration the Running Track Type</b> M. Truta, M. Marinescu, R. Vilau and O. Fieraru	483
<b>Static and Dynamic Analysis of a Planetary Gearbox Working Process</b> M. Truta, O. Fieraru, R. Vilau, V. Vinturis and M. Marinescu	489
<b>Non-Intrusive Hybrid Energy Monitoring System</b> M. Temneanu and A. Ardeleanu	495
<b>Design and Realization of a Sound Module for a Miniature Model Steam-Locomotive</b> M.P. Ursu, T. Buidoş and G. Albert	500
<b>Drying Simulation of Shrinkable Clay Tiles Using Variable Diffusivity Model</b> M. Vasić and Z. Radojević	506
<b>Complex 3D Measuring by Multiple Laser Scanning of Automotive Parts</b> A.C. Voicu and G.I. Gheorghe	511
<b>Mathematical Model of the Damped Variable Cross Section Beam in Transportation</b> S. Zolkiewski and L. Dzikowski	517

## Chapter 4: Robotics and Computer Integrated Manufacturing

<b>Controlling a Social Robot - Performing Nonverbal Communication through Facial Expressions</b>	
F. Adăscălitei, I. Doroftei, D. Lefebvre and B. Vanderborght	525
<b>Functional Evaluation and Performance Improvement of a Gantry IR's NC Axes</b>	
G.C. Avram, F.A. Nicolescu, F.D. Anania and E. Strajescu	531
<b>Simulation of the Stewart Platform Carried out Using the Siemens NX and NI LabVIEW Programs</b>	
W. Banaś, K. Herbuś, G. Kost, A. Nierychłok, P. Ociepka and D. Reclik	537
<b>The Command of a Virtual Industrial Robot Using a Dedicated Haptic Interface</b>	
S. Butnariu and F. Gîrbacia	543
<b>Mobile Robot Trajectory Analysis Using Computational Methods</b>	
D. Coman and A. Ionescu	549
<b>An Overview on the Design of Mobile Robots with Hybrid Locomotion</b>	
A. Conduraru (Slătineanu), I. Doroftei and I. Conduraru	555
<b>Localization Methods for Mobile Robots - A Review</b>	
I. Conduraru, I. Doroftei and A. Conduraru (Slătineanu)	561
<b>Kinematic Modelling and VR Simulation of a 3DOF Medical Parallel Robot with One Decoupled Motion</b>	
N. Cretescu, M. Neagoe and R.G. Saulescu	567
<b>Preliminary Ideas on Designing an Unmanned Aerial Vehicle Based on Coanda Effect</b>	
O.V. Crivoi, I. Doroftei and F. Adăscălitei	573
<b>Controlling the Movement of the Robot's Effector on the Plane Using the SVG Markup Language</b>	
K. Foit	577
<b>Integration of a Virtual 3D Model of a Robot Manipulator with its Tangible Model (Phantom)</b>	
K. Herbuś, G. Kost, D. Reclik and J. Świder	582
<b>Design of Collaborative, Cross &amp; Carry Mobile RoBots "C<sup>3</sup>Bots"</b>	
B. Hichri, J.C. Fauroux, L. Adouane, Y. Mezouar and I. Doroftei	588
<b>Dynamic Modelling of a 3DOF Medical Parallel Robot with One Decoupled Motion</b>	
M. Neagoe, N. Cretescu and R.G. Saulescu	594

## Chapter 5: Technology Transfer

<b>Business Ecosystems: Strategy Maps in Relation to Sustainable Development</b>	
E.G. Avram and S. Avasilcăi	603
<b>Environmental Analysis Procedure for Implementation of Environmental Management System ISO 14001 in Shipping Company</b>	
A.L. Bostina and A. Bostina	607
<b>Initiatives of Textile Industry Organizations towards Environmental Issues</b>	
A. Butnariu and S. Avasilcăi	612
<b>Methods of Manufacturing Data Acquisition for Production Management - A Review</b>	
G. Cwikła	618
<b>Model and Analysis of the Key Factors Influencing Organizational Changes Implementation within Business Processes</b>	
C.P. Fuiogă (Băsu)	624
<b>Assessment of the Risk Parameters and their use in the Vessels Traffic Management</b>	
M.G. Ghiba	628
<b>Conceptual Research Model Regarding the Effects Resulted from the Implementation of Environmental Management System at Organization Level</b>	
I.V. Herghiligiu, M.L. Lupu, C. Robledo and A. Kobi	634
<b>Technological Entrepreneurship: Success Factors as Perceived by Potential Young Entrepreneurs</b>	
C.M. Nacu and S. Avasilcăi	639

<b>CFD Study on must of Grapes Separation in a Hydrocyclone</b> P. Cârlescu, I. Tenu, M. Baetu and R. Rosca	645
<b>Cloud Computing Environment for Engineering and Business Education</b> G. Raicu and A. Raicu	651
<b>Factors Influencing Employees' Motivation for Knowledge Communication</b> G. Rusu and S. Avasilcăi	657
<b>Market Oriented Approach to the Production Management on the Operational Level</b> B. Skolud	663
<b>The Importance of Understanding the Stakeholders in Industry Actions - A Corporate Social Responsibility Perspective</b> I. Teodoreanu and C.I. Ivanov	669

## **Chapter 6: Micro and Nano Technologies**

<b>Orthopaedic Prosthetic Systems Topographically Characterized at Nanometric Scale</b> L.L. Badita and G.I. Gheorghe	675
<b>ESD Garments with Bilayer Structure</b> C. Donciu	682
<b>Estimating ESD Properties of Fabrics Based on Correlation between Dielectric Losses and Charge Decay Time</b> C. Donciu	688
<b>Nanotechnology and Processes the Nanophotovoltaic Panels</b> M.A.M. Ferreira, J.A. Filipe and J. Chavaglia	694
<b>Modeling of Strain and Stress States for Straight Rods with Particular Cross Sections Subjected to Torsion</b> M. Glovnea and C. Suciu	699
<b>Dilatometry and DTA Analyses of a Sample Made of Ni Base Super Alloy with a <math>ZrO_2/20\%Y_2O_3</math> Ceramic Layer</b> G.L. Pintilei, S.I. Strugaru, C.B. Papatoiu, C. Paulin, A. Bârcă and C. Munteanu	705
<b>The Influence of Thermal Treatment upon Nanostructure and Composition of YZrO Based Ceramics Obtained by Atmospheric Plasma Spraying</b> G.L. Pintilei, F. Brânza, V. Nica, S.I. Strugaru, E.S. Bârcă and C. Munteanu	711
<b>Considerations on the Micro-Indentation and Differential Scanning Calorimetry of Arboform Reinforced with Aramid Fibres</b> S. Plavanescu, D. Nedelcu and N.M. Lohan	718

## **Chapter 7: Maritime Engineering and Navigation**

<b>Choosing the Optimum Method of Treating the Ballast Water Onboard Ships</b> N. Acomi, O.C. Acomi, A.L. Bostina and A. Bostina	727
<b>Hertz Contact Problem between Wheel and Rail</b> T. Axinte	733
<b>Analysis of Rails of a Ferry Boat under Wheels Contact Loading</b> T. Axinte	739
<b>Statistical Model for Ultra-Wide Band Radio Channels Onboard Ship</b> D. Deacu	745
<b>A Study Initiated because of the Global Warming from R-134a</b> F. Memet and D.E. Mitu	751
<b>Processing of the Data Obtained with the Advanced Doppler Velocymeter</b> F.V. Panaitescu, D. Deleanu and M. Panaitescu	757
<b>Energy Review on a Maritime Energy Transfer System for Comercial Use</b> A. Preda and A.A. Scupi	763
<b>Modern Education Facilities for CAD/CAM/CAE Training of the Future Maritime Engineers</b> A. Raicu and E. Oanta	769
<b>Comparative Analysis of Tanker Ships Incidents and their Environment Impacts</b> R. Tromiadis and C. Stanca	775

<b>Applying Determination Models for Human Errors in Sequential Analysis of Maritime Accidents</b>	
R. Tromiadis and R. Hanzu-Pazara	780
<b>Transshipment Modeling and Simulation of Container Port Terminals</b>	
E. Roşca, Ş. Raicu, M.A. Roşca and Ş. Burciu	786
<b>Different Methods of Refloating a Ship</b>	
A. Varsami	792