

FACULTY OF ENGINEERING IN HUNEDOARA



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RESEARCH CENTER OPTIMIZATIONS IN THE INDUSTRY OF MATERIALS

GENERAL PRESENTATION

The Research Center "Optimizations in the Industry of Materials" is recognized by the National Board of Higher Education Scientific Research through certificate No. 100/CC-C of 11.05.2001. It is established at the Faculty of Engineering in Hunedoara and it includes staff involved in the research activity in the fields of electrotechnics, mechanics and metallurgy.

The Department of Electric Engineering and Industrial Computer Science has specialized laboratories for researches on the functioning of the rotative electric equipment and transformers, electrical equipment, electric and electronic circuits, for carrying out the achievement and processing of data, the analysis of the quality of the electric power of different consumers, studying the electromagnetic compatibility, the analysis and synthesis of the automatic adjustment of the parameters of the industrial processes, using the classic adjustment methods, as well as new methods, based on the fuzzy logic, neuronal networks, expert systems, Also we are mainly interested in the semigroups of operators theoretical approach to problems originating from mathematical-physics, to gain mathematical understanding of quantum field theory and statistical mechanics, in the uniqueness problems for finite and infinite dimensional diffusion operators and modeling and simulation in nanomagnetism.

In the laboratories of the Department of Engineering and Management, the teaching staff can carry out researches in the fields of chemistry, plastic deformation, studies related to the elaboration of iron and non-ferrous materials, thermal treatments and economic researches (prognosis, diagnosis etc.).

The material resources and infrastructure of the Department of Engineering and Management ensures the possibility of carrying out mechanic tests at the surrounding temperature and low temperatures, the research of the behavior of some machinery parts (belts, bearings, springs etc.) during functioning and the tribologic analysis of lubricants and various pairs of materials.

MISSION

The Research Center "Optimizations in the Industry of Materials" offers the framework for scientific research and human resources formation activities in the field of electrotechnics, mechanics, the science of materials, automotive engineering and industrial computer science.

The research activity carried out within the research center is strictly related with the teaching process and aims at:

- solving research topics in the field of materials
- forming specialists who may contribute, through their qualification and performances, to the enlargement of the state of knowledge
- raising the competitiveness of the Faculty of Engineering in Hunedoara on the qualifications market requested by the market economy
- forming of elites within the young generation
- obtaining outside the budget incomes for the modernization of the laboratory infrastructure.

FIELDS OF RESEARCH

Improvement of power factor in electrical installations with non-linearity and un-balanced loads. Improvement and analysis of electromagnetic compatibility for different loads: plate-type electrostatic precipitators, lighting systems, modern inverters welding power supplies, and variable speed drives. Implementation of programmable logic controllers in industrial applications. Electromagnetic compatibility. Numerical modeling and control of the induction heating electro-technology. Numerical protection relays. Artificial Intelligence, Distributed programming, Multi-agent systems, Distributed. Constraint Satisfaction Problem. Control of industrial processes. Neuro-fuzzy expert systems. Modeling, simulation and control of processes. Researches about the power quality in the railway electric transport. Researches on the control of the metal continuous casting process. Improvement of performances for classical and special electrical machines. Generation of electrical energy with variable speed in microhydro and eolian power plant. Improvement of performances for electrical variable speed drives. Modern electrical traction systems. Static performance converters. Study of electric vehicles and hybrid electric vehicles. Computational geometry. Artificial Intelligence. Software Engineering. Computer - Assisted Instruction. Modelling, simulation and automation of processes in the sintering plants by Fuzzy logic. Researches concerning modelling and control of the processes from sintering plants. Analysis of electromagnetic fields by finite element method, PLC programming design of SCADA systems, electrical machine design, optimization of electromechanical systems. Installation with electromagnetic induction. Electrothermics. Numerical modeling and simulation of

electromagnetic and thermal fields. Data acquisition systems. Programming languages. Real time and concurrent programming. Computer networks. Partial Differential Equations: equations of mathematical physics. Operator Theory: semigroups of linear operators. Global Analysis, Analysis on Manifolds: partial differential equations on manifolds. Probability Theory and Stochastic Analysis: applications of stochastic analysis to partial differential equation. Mathematical modeling. Computational mathematics. Applied mathematics. Computational fluid dynamics. Optimization techniques. Mathematical Analysis: Control Theory. Database, programming and data processing on integrated system SAP. Wireless Sensor Networks. Programming languages. Real time and concurrent programming. Computer networks. Nanomagnetism. Analysis of adaptive control of nonlinear power loads. Analysis of adaptive algorithms and filtering. Analysis of adaptive control of nonlinear power loads. Analysis of adaptive algorithms and filtering. Data acquisition. Signal processing.

Research on fluid motions with sliding phenomena on plane surfaces in the first-order approximation. Processing of experimental data by mathematic modeling with truncate probability laws. Theory of operators, study of stability and dichotomy of a solution of differential equations. Machines and hydro-pneumatic actuations. Rolling of materials. Research development for continuous casting products. Waste recycling. Environmental protection. Materials science and technology. The optimisation of the processes of elaboration and solidification of the steel. Research development for continuous casting products. The recovery and the development of the metallic scraps. Waste recycling. Environmental protection. Thermal fatigue and durability of the hot rolling mill cylinders. Resistance of materials. Elasticity. Plasticity. Analysis of tensions and deformations between the wires of the steel ropes. Thermodynamics. Heat transfer and thermal machines. Numerical simulating of thermal stratification phenomena in steel ladles.

KEYWORDS

Plate-type electrostatic precipitators; fluorescent lamps; welding supplies; power factor; power quality; programmable logic controllers; power quality; harmonic distortion; induction heating; numerical modeling; numerical control; numerical protection; constraints programming; distributed problems; asynchronous searching techniques; messages, agents, multi-agent systems; modeling and simulating; automation; neuro-fuzzy systems; power quality indicators; harmonic regime; continuous casting; secondary cooling; mould level; electrical machines; designing and optimization; static frequency converters; variable speed;

regenerable energy; electric drives; electric vehicles; dynamic geometry system; automated geometry theorem proving; UML; expert system; fuzzy logic; sintering plant; microcontroller; electromagnetics; finite element method; PLC; programming; SCADA; electrical machine design; optimization; electromechanical systems; electromagnetic induction; high frequency; active filters; electrothermics; simulation; coupled fields; data acquisition; programming; networking; C_0 -semigroups; integrated semigroups; L^∞ -uniqueness; diffusion operators; Fokker-Planck equation; computational mathematics; spectral techniques; finite element techniques; swirling flows; optimization; evolution process; truncate probability densities; operators in Banach and Hilbert spaces; exponentially stability; exponential dichotomy; Lyapunov equations; Access; ABAP; JAVA; Web Dynpro; Programming; networking; adaptive control; adaptive filtering; adaptive control; adaptive filtering; modelling and simulating; signal processing; steel; waste; environment; casting; ingot; continuous casting; semifinished products; pulverous waste; lime; dolomite; non-ferrous slags; quality; advanced materials; fatigue; tensions; durability; optimization; cylinders; numerical modeling; heat transfer; durability.

ACTIVITIES

- Analysis of plate-type electrostatic precipitators
- Analysis of fluorescent lamps with electronic ballast
- Analysis of modern inverter welding power supplies
- Implementation of some programmable logic controllers in industrial applications
- Power quality measurement for crucible induction furnaces supplied at industrial frequency
- Study about numerical relays for overcurrent and differential protections of transformers
- The implementation of the asynchronous techniques in NetLogo.
- Implementation and evaluation model for the asynchronous search techniques: MAS NetLogo Models-c. Available: <http://discsp-netlogo.fih.upt.ro/>
- The introduction of a model of implementation and evaluation for the asynchronous search techniques in NetLogo, with support for the message synchronization and management
- The use of the model in the study of agents behavior in several situations, like the priority order of the agents, the synchronous and asynchronous case, leading, therefore, to identifying possible enhancements of the performances of asynchronous search techniques

- Expert system for LC protection
- Algorithms for raw material dosage control for cement plants
- Statistical identification of industrial processes
- Study about the main indicators of the power quality
- Analysis of the electric power quality
- Achievement of a filtration system of the main harmonics of voltage and current
- Projection of an automatic system of filtration of the harmonics current
- Study about the principles and methods of the reduction of the harmonic regime
- Studies and investigations on automation and optimization of continuous casting process
- Modelling and control of continuous casting process using Fuzzy logic
- Analysis of reactive homopolar synchronous generator with stator excitation used in electrical energy generation
- Analysis of asynchronous single phase generator
- Analysis of modern static frequency converter for industrial application
- Analysis of asynchronous machine for electric traction
- Analysis and design of electric drive system for hybrid electric vehicles
- Data Structures and Algorithms
- Object Orientated Programming
- Software Engineering
- Studies and investigations on automation and optimization of sintering processes
- Modelling and control of sintering processes using fuzzy logic
- Software-oriented controller for hierarchical management of materials transportation process in sintering plants
- Design diagrams and electrical installations using software CAD electric/SEE Electrical
- Low speed generators for wind energy conversion (gearless low speed, direct driven from wind turbine, permanent magnet synchronous generator)
- Computation of the magnetic circuit containing permanent magnets (main field, leakage field, establishing of the running point of the magnet from the mmf and flux density point of view; lumped parameter method)
- Design optimisation of high efficiency motors (axial flux, permanent magnet, flux reversal with nonoverlapping windings Permanent magnet brushless motor (BLDC or BLAC)
- Cracks detection in continuous casting process
- Identification, modeling and control of continuous casting process
- Study about high frequency dielectric heating
- Study about optimization of microwave multimode applicators
- Studies in computational fluid dynamics, swirling flow motions and stability analysis of some type of vortices
- Modeling and optimization of fluid systems, mechanical systems and in electromagnetism
- Finite element and spectral techniques development for nonlinear time-dependent problems
- Soft architecture study on integrated systems
- Researches about the reduction of the electromagnetic pollution at the high frequency electrothermal equipments
- Researches about LC protection in railway equipments using Fuzzy expert systems
- Research stages: 4 May 2009 - 27 May 2009: Blaise Pascal University of Clermont-Ferrand, France (Lemle Dan Ludovic)
- Conferences participation
- Invited as plenary speaker to the 13 WSEAS International Conference on Computers (Panoiu Manuela, Pănoiu Caius, Deaconu Sorin Ioan)
- Assimilating in the fabrication process of new technologies of carbon and alloyed steel making;
- Improving the technologies of carbon and alloyed steel making and casting in the direction of improving the physical – mechanical and technological characteristics;
- Reducing the electric power and thermal energy consumption, auxiliary and raw materials, refractories and metal specific consumption;
- Introducing in the iron and steel industry economic circuit of some metal waste with iron content resulted from different industrial branches (iron and steel industry, energetic industry, mining industry, mechanical engineering industry, chemical industry, etc.);
- Quantitative and qualitative analysis of steel surface contamination by X-Ray photoelectron spectroscopy (XPS);
- Steel sample preparation by ionic (Ar^+ ion sputtering) and chemical cleanings for plasma nitriding treatment;
- Chemical and microstructural study of the plasma-nitrided steel samples by XPS, Electron Probe MicroAnalysis (EPMA) and light microscopy;
- Concentration and microhardness depth profiling in the nitrided layer;
- Internal combustion engine;
- Air filter for internal combustion engine;
- Finite element analysis in Heat transfer;
- Heat transfer in internal combustion engine;
- The explication and the interpretation behavior in operate the entities based on observation of these condition;
- Know and the agreement of the process of operation breakdown of the entities;
- Analyses the tribological phenomena from the operation of electro-mechanic entities;
- Analysis of the moulding – casting technology of the casting pieces
- Experimental analysis of the strain state in the mill rolls, using the numerical simulation

- Researches regarding semisolid state processing of steel. Technologies for obtaining parts from metallic alloys in semisolid state
- Analysis of the influence of mechanical vibration on the microstructure and mechanical properties of the pieces obtain through rheoforging
- Optical study of solid surfaces and polymer films deposited on solid surfaces (ellipsometry, and IR spectroscopy).
- Study of chemical and electrochemical corrosion of metals and methods of anticorrosive protection.
- Statistical processing of results for the predictive maintenance of an industrial fan
- Reliability of the Parallel Gang Shears
- Hidraulique and pneumatics
- Industrial management
- Industrial researches in human resources area
- Cast iron rolls technologies
- Cast iron rolls durability in exploitation
- Quality assurance
- Optimization methods of the industrial processes
- Plastic deformations and rolling technologies
- Analysis of the thermal fatigue and the durability of the hot mill rolling cylinders;
- Theoretical and experimental analysis of the thermal fatigue of the automotive engines;
- Analysis of the thermal shock upon the hot mill rolling cylinders and of the automotive engines.

RESEARCH PROJECTS

1. Project no. 71-044/2007: *Advanced technology direction of pieces case-hardening industrial process in induced current*, Program PN2 – Consortium – Partner P2. Responsible: Prof. dr. eng. Teodor Hepuț. Total value of the contract RON 1.449.550 (Partner P2- RON 10.376).
2. Project no 31-098/2007: *Prevention and fighting pollution in the steel making, energetic and mining industrial areas through the recycling of small-size and powdering wastes*, Program PN2 – Consortium – CO. Responsible: Prof. dr. eng. Teodor Hepuț. Total value of the contract RON 1.980.000 RON (CO- RON 284.398).
3. Project no 28/2009: *Research on service behavior, in laboratory conditions, of refractory products used in iron and steel casting*, Responsible: Lecturer. dr. eng. Ardelean Marius. Total value of the contract 45.000 RON.
4. Project no 94/2009: *Establishing the optimal solutions for the recovery of waste ferrous powder*, Responsible: Assoc. Prof. dr. eng. Socalici Ana. Total value of the contract 25.000 RON.
5. *Energetic performances improving of electrical loads from S.C. ISON Trade Construct S.R.L.*, no. 93/18.09.2009, 8 months, 76.000 RON, director Popa Gabriel Nicolae
6. *Expert system for LC protection*, no. 53/14.05.09, 59.500 RON, director Rusu-Anghel Stela
7. *Unicité et propriété de Liouville pour le système dynamique de Glauber*, Laboratoire Européen Associé C.N.R.S. franco-roumain Math-Mode

PUBLICATIONS

BOOKS

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2. D. Bistriean, D. Stoica, Șt. Maksay, *Matematici asistate de calculator. Aplicații*, Editura Politehnica, Timișoara, 2009, 167 pp., ISBN 978-973-625-917-3.
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6. Miloștean, D., Hepuț, T., Socalici, A., Ardelean E., *Baza energetică și de materii prime. Aplicații - Energetic and raw materials base. Applications*, Politehnica Publishing House, Timișoara, 2009, ISBN 978-973-625-843-5, 68 pp. (published in Romanian language).
7. Monica Erika Popa, *Cercetari privind influenta proceselor fizico-chimico-metalurgice ce au loc la interfetele cristalizor-zgura-otel lichid / Teza de doctorat - Researches on the influence of physico-chemical-metallurgical processes taking place at the crystallizer - slag- liquid steel interfaces upon the quality of continuous cast steel / Doctoral thesis*, Politehnica Publishing House, Timișoara, 2009, ISBN 978-606-554-029-3, 261 pp. (published in Romanian language).
8. Miklos Imre Zsolt, Budiul Berghian Adina, Miklos Imre, *Organe de mașini - Transmisii cu element flexibil*, „Mirton” Publishing House of Timișoara, 2009, ISBN 978-973-52-0555-3, 160 pp. (published in Romanian language).
9. Vilceanu Lucia, Flori Mihaela, *Thermodynamics – Practical experiments*, „Politehnica” Publishing

House of Timisoara, 2009, ISBN 978-606-554-031-6, 91 pp. (published in Romanian language).

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8. A. Iagar, G. N. Popa, C. Dinis, *Assessment of Power Quality for Line Frequency Coreless Induction Furnaces*, WSEAS Transactions on Circuits and Systems, ISSN 1109-2734, Vol. 8, 2009, pp. 115-124.
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14. Rusu-Anghel Stela, Tirian G.O., *Experimental research for identifying industrial processes by statistical methods*, 10th International Symposium "Interdisciplinary Regional Research" - Romania - Hungary - Serbia, ISIRR 2009, Hunedoara, Romania, 2009, 23-24 Aprilie, ISSN 1584-2673.
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24. Deaconu Sorin Ioan, Topor Marcel, Tutelea Lucian Nicolae, Popa Gabriel Nicolae, Abrudean Cristian, *Modelling and Experimental Investigations of a Reactive Homo-Heteropolar Brushless Synchronous Machine*, Preprint of IECON 2009 Proceedings Porto Portugalia, pp. 1205-1212.
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- Research concerning harmonic distortion produced by induction hardening equipment
 - Development of some mathematical models 2D and 3D based on FMD, and of some simulating programs, able to allow numerical control of induction heating for pieces with complex shape
 - The expansion of the NetLogo models, used at the implementation of the asynchronous techniques to allow the agents to operate with multiple variables
 - The introduction of the new problems for the analysis of the asynchronous techniques, problems which are called “binary random problems”, which allow the more exact study of the asynchronous techniques behaviour
 - The implementation a new solver for distributed constraint programming: DisCSP-NetLogo.
 - Automation of industrial installation using neuro-fuzzy systems
 - Command systems about the reduction of the harmonic regime and the compensation of the power factor
 - Power commutation devices
 - Industrial process simulation tehniques
 - Modelling and control of industrial processes using Fuzzy logic
 - The management of the process of secondary cooling for steel continuous casting
 - Simulation and data acquisition using the LABView software
 - Development of applications on produced electrical energy with variable speed
 - Estabilish the electrical performances of static frequency converter for use in microhydro and eolian power plant
 - Improvement of performances of electric drives of hybrid electric vehicles
 - Intelligent system for geometry theorem proving
 - Modelling and control of industrial processes using Fuzzy logic
 - Simulation and data acquisition using the LABView software
 - Researches upon the hierarchical control of a conveyor belt system from the sintering plants
 - Identification, control and optimization of metallurgical processes
 - My research interests are in bringing contributions in reducing the effects of the generated non-sinusoidal regime
 - Automation of industrial installation using neuro-fuzzy systems with application in continuous casting
 - Research concerning harmonic distortion produced by induction hardening equipment
 - Development of some mathematical models 2D and 3D based on FMD, and of some simulating programs, able to allow numerical control of induction heating for pieces with complex shape

PERSPECTIVES, INTERESTS, STRATEGIC PRIORITIES

- Development of applications with programmable logic controllers used in industry
- Establish the electrical performances of plate-type electrostatic precipitators, inverter power supplies and fluorescent lamps with electronic ballast
- Improving power factor in electrical installations with non-linearity and un-balanced loads

- To continue the research project *Unité et propriété de Liouville pour le système dynamique de Glauber*, Laboratoire Européen Associé C.N.R.S. franco-roumain Math-Mode
- Development of numerical methods and algorithms for hydrodynamic stability studies using computer simulations of steady flows and swirling flows
- Adobe technology, workflow and data processing on integrated system SAP
- Research concerning Data Agregation algorithms for a Wireless Sensor Network
- Studies on optimising the specific absorption rate (SAR) in the magnetic hyperthermia, with superparamagnetic nanoparticles
- Development of some mathematical models for electric arc based on fuzzy techniques for simulating the electric installation of the EAF in order to control de process and to reduce the electromagnetic pollution and power consumption
- The assimilation into manufacturing of some new technologies of elaboration and casting of carbon and allied steels
- Perfecting the technologies of elaboration and casting of carbon and allied steels in the way of improving the physical, mechanical and technological characteristics
- The reduction of the electric and thermic energy consumption, raw and auxiliary materials, refractory materials, specific metal consumption
- Reintroducing into the economic circuit of some metallic scraps with iron content, came from different industrial branches (siderurgical industry, energetical industry, mining industry, mechanical engineering, chemical industry, etc.)
- Reducing the degree of pollution in the siderurgic, energetic and mining industry
- Improving the parameters of the continuous casting technology of the steels and the extension of the continuous casting to a various range of tipodimensions of semi-finished products
- The management of the process of secondary cooling for steel continuous casting
- Analysis of steel surface contamination in air exposure (oxidation).
- Surface steel nitriding in laboratory conditions with a glow-discharge source.
- Analysis of the defects existing in the bulk material (segregation bands) on the structure and properties of industrial plasma nitrated steel samples.
- The numerical simulation of the heat transfer in combustion chamber of an internal combustion engine;
- The numerical simulation of the dynamic transfer concerning the intake air trough air filters in Internal Combustion Engine.
- The improvement of the performances in exploitation the entities.
- The numerical simulation of the hot rolling process for analyze the durability in exploitation of the mill rolls.
- The numerical simulation of the casting pieces.
- Experimental researches on the semisolid state rheoforging of steel in the presence of mechanical vibration of small frequencies.
- The optical constants of solid materials by reflectance spectra recorded at two angles of incidence.
- Solutions for Breed the Reliability
- Symetrical and asymetrical rolling of materials
- Indefinite rolling mills cast-iron rolls quality assurance
- Analyse of the thermal regime of the automotive engines used numerical method of calcul.

RESEARCH TEAMS

1. Implementation of programmable logic controllers in industrial applications

- Lect.dr.eng. Gabriel Nicolae Popa
- Assoc. Prof.dr.eng. Sorin Ioan Deaconu
- Assoc. Prof.dr.eng. Iosif Popa
- Lect.dr.eng. Angela Iagar
- Lect.dr.eng. Corina Maria Dinis

2. EMI tests

- Lect. dr. eng. Angela Iagăr
- Lect. dr. eng. Popa Gabriel
- Assoc. prof. dr. eng. Caius Pănoiu
- Assoc. prof. dr. eng. Sorin Deaconu
- Assist. drd. eng. Cristian Abrudean
- Lect. dr. eng. Diniş Corina
- Lect. dr. eng. Cunţan Corina
- Assist. drd. eng. Baciuc Ioan

3. Numerical modeling and control of the induction heating electro-technology

- Lect. dr. eng. Angela Iagăr
- Assoc. prof. dr. eng. Caius Pănoiu
- Assoc. prof. dr. eng. Sorin Deaconu
- Lect. dr. eng. Popa Gabriel
- Assist. drd. eng. Cristian Abrudean

4. Implementation and evaluation of the asynchronous search techniques in NetLogo

- Lect. dr. Muscalagiu Ionel
- Lect. dr. Popa Horia Emil
- Assoc. prof. dr. eng. Manuela Pănoiu
- Assist. eng. Cristian Abrudean
- Lect. Dr. Osaci Mihaela.

5. Control of industrial processes, neuro-fuzzy expert systems, modeling, simulation and control of processes

- Lect.dr.eng. Stela Rusu-Anghel
- Assist. eng. Gelu Ovidiu Tirian
- Assoc. prof. dr. eng. Caius Panoiu
- Assoc. prof. dr. eng. Manuela Panoiu
- Assist. eng. Marcel Topor

6. Analysis of a reactive homopolar synchronous machine

- Assoc. prof. dr. eng. Sorin Deaconu
- Lect. dr. eng. Gabriel Nicolae Popa
- Assist. eng. Marcel Topor
- Lect. dr. eng. Maria Corina Diniş

7. Analysis of asynchronous single phase generator

- Assoc. prof. dr. eng. Sorin Deaconu
- Assist. eng. Marcel Topor
- Lect. dr. eng. Gabriel Nicolae Popa
- Lect. dr. eng. Maria Corina Diniş

8. Analysis of modern systems with PM synchronous machine and static frequency converters for hybrid electric vehicles

- Assoc. prof. dr. eng. Sorin Deaconu
- Lect. dr. eng. Gabriel Nicolae Popa
- Assist. eng. Marcel Topor
- Lect. dr. eng. Angela Iagăr

9. Numerical modeling of multidimensional data in variate problems and algorithms development in computer fluid dynamics.

- Prof. dr. Ştefan Maksay
- Lect. dr. Dan L. Lemle
- Assist. math. Diana A. Bistrian
- Assist. math. Diana M. Stoica

10. Algorithms development in non-linear hydrodynamic problems and numerical modeling of multidimensional data in variate problems

- Prof. dr. Ştefan Maksay
- Assist. drd. Diana A. Bistrian

11. Operator theory and stochastic analysis

- dr. Ludovic Dan Lemle, “Politehnica” University of Timişoara, Engineering Faculty of Hunedoara
- dr. Flavius Pater, “Politehnica” University of Timisoara, Department of Mathematics
- dr. Tudor Binzar, “Politehnica” University of Timisoara, Department of Mathematics
- Diana Monica Stoica, “Politehnica” University of Timisoara, Engineering Faculty of Hunedoara
- dr. Liming WU, Blaise Pascal University of Clermont-Ferrand, Department of Mathematics

12. Modeling and simulation in nanomagnetism

- Lect. dr. Osaci Mihaela
- Assoc. prof. dr. eng. Panoiu Manuela
- Lect. dr. Muscalagiu Ionel
- Assist. eng. Abrudean Cristian
- Assist. eng. Berdie Adela Diana

13. Software architectures on itegrated systems

- Lect. dr. Osaci Mihaela
- Dr. Reinhold Haipl, BASF IT Services GmbH, Ludwigshafen, Germany (associate

professor of “Politehnica” University of Timisoara)

- Assist. eng. Berdie Adela Diana

14. Using fuzzy techniques for modelling electric arc

- Assoc. prof. dr. eng. Manuela Pănoiu
- Assoc. prof. dr. eng. Caius Pănoiu
- Lect. dr. Mihaela Osaci
- Assist. eng. Raluca Rob
- Assist. dr. Anca Iordan

15. The reduction of the electromagnetic pollution at the high frequency electrothermal equipments

- Assoc. prof. dr. eng. Caius Pănoiu
- Assoc. prof. dr. eng. Manuela Pănoiu
- Assist. eng. Abrudean Cristian
- Assist. eng. Raluca Rob
- Assist. dr. Anca Iordan

16. Optimization of the thermal regime of steel on the direction of furnace–secondary treatment unit – continuous casting installation

- Lect. dr. eng. Erika Ardelean
- Lect. dr. eng. Ana Socalici
- Lect. dr. eng. Marius Ardelean
- Lect. dr. eng. Corina Cunţan
- Assist. Eng. Erika Popa
- Assist. Eng. Cristian Abrudean

17. Refractories with complex functions used in the steel industry, made by modern technologies

- Prof. dr. eng. Teodor Hepuţ
- Lect. dr. eng. Erika Ardelean
- Lect. dr. eng. Ana Socalici
- Lect. dr. eng. Marius Ardelean
- Lect. dr. eng. Laura Benea
- Lect. dr. eng. Ana Josan
- Prof. dr. Ştefan Maksay
- Assist. Adrian Bleoca

18. Integrated technology used to obtain some non-conventional energy technological sources, used as raw materials for steel making

- Prof. dr. eng. Teodor Hepuţ
- Lect. dr. eng. Erika Ardelean
- Lect. dr. eng. Ana Socalici
- Lect. dr. eng. Marius Ardelean
- Lect. dr. eng. Caius Pănoiu
- Asist. dr. eng. Adrian Găvănescu
- Lect. dr. eng. Mihaela Osaci
- Lect. dr. eng. Vasile Puţan

19. Advanced technology direction of pieces case-hardening industrial process in induced current

- Prof. dr. eng. Teodor Hepuţ
- Lect. dr. eng. Erika Ardelean
- Lect. dr. eng. Ana Socalici
- Lect. dr. eng. Marius Ardelean
- Assoc. prof. dr. eng. Caius Pănoiu

- Assoc.prof.dr.eng. Manuela Pănoiu
- Lect. dr. eng. Vasile Puțan
- Lect. dr. eng. Gabriela Mihuț
- Lect. dr. eng. Doina Petre

20. Assimilating, making, casting of iron, steel and non-ferrous alloys

- Lect. dr. eng. Virginia Socalici
- Lect. dr. eng. Erika Ardelean
- Lect. dr. eng. Marius Ardelean
- Lect.dr.eng. Camelia Pinca-Bretotean
- Assist. eng. Erika Popa

21. Prevention and fighting pollution in the steel making, energetic and mining industrial areas through the recycling of small-size and powdering wastes

- Prof.dr.eng. Teodor Hepuț
- Lect. dr. eng. Erika Ardelean
- Lect. dr. eng. Ana Socalici
- Lect. dr. eng. Marius Ardelean
- Assoc.prof.dr.eng. Caius Pănoiu
- Assoc.prof.dr.eng. Manuela Pănoiu
- Lect. dr. eng. Vasile Puțan
- Lect. dr. eng. Ana Josan

22. Surface analysis of plasma nitrated steels

- Asist.dr.eng. Mihaela Flori
- Prof.dr. Bernard Gruzza
- Asist.dr.eng. Daniela Milostean
- Drd.eng. Florin Dragoi.

23. Dynamic transfer concerning the intake air trough air filters in Internal Combustion Engine

- Lect. dr. eng. Sorin Rațiu
- Conf. dr. eng. Carmen Alic
- Conf. dr. eng. Liviu Mihon
- Stud. Corneliu Birtok-Băneasă

24. The availability of entities

- Assoc.prof.D.Sc.Eng Teodor Vasiu
- Lect. D.Sc.Eng. Adina Budiul-Berghian

25. Analysis of the moulding-casting technology of the casting pieces

- Lect. dr. eng. Josan Ana
- Lect. dr. eng. Putan Vasile
- Lect. dr. eng. Petre Doina

26. Experimental researches regarding semisolid state processing of steel

- Assist. dr. eng. Daniela Miloștean
- Lect. dr. eng. Vasile Cioată
- Assist. dr. eng. Flori Mihaela
- Dr. eng. Drăgoi Florin

27. Approaches of cast-iron rolls quality assurance

- Assoc. prof. dr. eng. Kiss Imre
- Lect. dr. eng. Cioata Vasile George
- Lect. dr. eng. Ratiu Sorin

28. Analysis of the thermal fatigue of the automotive engines

- Conf. dr. eng. Vilceanu Lucia

- Lect. dr. eng. Putan Vasile
- Asist. drd. eng. Tirian Gelu Ovidiu
- Asist. drd. Bistriana Diana

29. State of stress, deformations and vibrations analysis on deformation mechanics systems constrained on static and dynamic strain

- Assoc. prof. dr. eng. Carmen Alic
- Assoc. prof. dr. eng. Imre Miklos
- Lecturer dr. eng. Vasile George Cioată
- Lecturer dr. eng. Zsolt Miklos
- Assist. eng. Cristina Miklos

30. Theoretical and experimental researches regarding the prediction of workpiece machining error

- Lect. dr. eng. Cioată Vasile George
- Lect. dr. eng. Kiss Imre
- Lect. dr. eng. Miklos Imre Zsolt

31. Theoretical and experimental researches regarding the die-forging of the metallic alloys in semisolid state

- Lect. dr. eng. Cioată Vasile George
- Prof. dr. eng. Hepuț Teodor
- Lect. dr. eng. Kiss Imre
- Lect. dr. eng. Alexa Vasile

32. Theoretical and experimental researches regarding the die-forging of the metallic alloys in semisolid state

- Lect. dr. eng. Cioată Vasile George
- Prof. dr. eng. Ilca Ioan
- Assist. dr. eng. Miloștean Daniela-Cătălina
- Lect. dr. eng. Kiss Imre

33. Analysis of heat transfer in thermal machines and automotive.

- Assoc.prof.dr.eng. Vilceanu Lucia
- Lect. dr. eng. Vasile Puțan
- Lect.dr.eng. Rațiu Sorin

34. Numerical analysis of the stress and strain state between the steel wires ropes.

- Prof.dr.eng. Weber Francis
- Assoc.prof.dr.eng. Vilceanu Lucia
- Assoc.prof.dr.eng.Pinca-Bretotean Camelia
- Lect. dr. eng. Dascăl Amalia

35. Analysis of the moulding-casting technology of the casting pieces

- Lect. dr. eng. Josan Ana
- Lect. dr. eng. Putan Vasile
- Lect. dr. eng. Petre Doina

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