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 Electrotechnics Department 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.

In the laboratories of the Metallurgy Department, 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 Mechanics Department 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 fields of electrotechnics, mechanics and metallurgy.

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

Modeling and simulation of electric and thermal equipment. Adaptive processing of signals. Implementation of programming automatic machines and micro controllers in applications. Increasing the electric power quality in the electric railway transport. Implementation of systems based on virtual reality and educational software applications. Assimilating, making, casting of steel, pig iron and non-ferrous alloys. Material research, plastic deformation, and thermal treatment. New technologies of producing composite materials and metal powders. Recycling the metal ferrous and non-ferrous waste in iron and steel industry and other branches. Optimizing the resistance structures. Theory of semi groups of limited linear operators both in Banach spaces and local convex spaces and its applications in the study of Schrödinger operators.

KEYWORDS

Induction heating; numerical modeling; numerical control; electromagnetic compatibility; optimizing; metallurgy; fatigue; tensions; mechanical characteristics; C_0-semi groups; regressions; elementary probability law; reliability; availability.

ACTIVITIES

- Numerical modeling (using the Finite Differences' Method -MDF and Finite Elements' Method - MEF) of electromagnetic and thermal fields of materials heated by electromagnetic induction;
- Analysis of electromagnetic interference produced by operating the induction hearth furnaces which are supplied at industrial frequency;
- Research on the main energy quality indicators;
- Analysis of the electric power quality;
- Accomplishing a filtering system for the main harmonic of voltage and current;
- Conceiving an automatic system of current harmonic filtering;
- Study on principles and methods of harmonic regime compensation;

- Conceiving the structure of a hierarchic system meant to lead the continuous casting process;
- Conceiving the structure of an expert system based on Fuzzy logic meant to control the level of steel in the crystallizing vessel and secondary cooling;
- Setting up the leading utility programs based on experimental measurements and conceived;
- Projecting the Fuzzy utility programs that are necessary to calculate the command figures used by these utility programs;
- Drawing up the rules' basis and their technological analysis using a mathematical model.
- 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.);
- Using in the iron and steel industry of some iron and non-ferrous metals concentrates (cobalt, nickel, molybdenum, wolfram) resulted from processing of gangue stored in slag dumps;
- Reducing the pollution degree in iron and steel industry;
- Improving the technologies of carbon steel and alloyed steel making technologies;
- New technologies of making and processing the metal alloys with special destination;
- Assimilation in fabrication process of some alloyed steels with special destination;
- Research on endurance in operating the main and auxiliary plastic deformation equipment;
- Studies and research on deformability and thermal treatment of high resistance steels;
- Technologies of iron making and casting assigned to cast pieces for mechanical engineering and metallurgical equipment;
- Studies on increasing the utilization characteristics of foundry alloys;
- Adapting new technologies of forming and casting ferrous and non-ferrous alloys;
- Numerical simulation of heating processes for steels in flame furnaces in order to accomplish plastic deformation;
- Research on thermal fatigue and endurance of rolls for rolling mills;
- Research on thermal and equivalent tensions of rolls for hot rolling mills;
- Processing in semi-solid status of metal alloys;
- Materials' tests at ambient temperature and low and high temperatures as well.

RESEARCH PROJECTS

1. Grant AT 2004 (continue in 2005): *Endurance research about running of rolls for hot rolling mills* - code CNCSIS 24 no. 32940/22.06.2004, Director: lect.dr.ing. Camelia Pinca-Bretotean, Value: 7.000 RON
2. Grant AT 2005: *Research on electric parameters of industrial plates' electrofilters* - code CNCSIS 73, no. 27688/14.03.2005, Director: lect.dr.ing. Gabriel Popa, Value: 9.000 RON
3. Grant A 2005: *Complex relay meant to protect the contact line against abnormal operating* regimes – code CNCSIS 623 no. 27688 / 14.03.2005, Director: lect.dr.ing. Caius Pănoiu, Value: 6.500 RON
4. Project CEEx - module II ET: 3196/13.10.2005: *Research and experiments on improving the continuous cast semi-finished steel products*, Director: lect.dr.ing. Ana Socalici, Value: 75.000 RON
5. Project CEEx - module II ET: 3194/13.10.2005: *Optimizing the steel thermal regime in the route treatment furnace – aggregate and continuous casting equipment*, lect.dr.ing. Erika Diana Ardelean, Value: 61.000 RON

PUBLICATIONS

BOOKS

1. Deaconu, S., *Machines and electric control*, "Politehnica" Publishing House, Timişoara, 2005, ISBN 973-625-200-0, 268 pages (published in Romanian)
2. Cristea, D., Iordan, A., Berdie, A., *Personal Computers' Utilization, laboratory guide*, "Mirton" Publishing House, Timişoara, 2005, ISBN 973-661-681-9, 78 pages (published in Romanian)
3. Raţiu, S., A., *Furnaces and heating equipment*, "Mirton" Publishing House, Timişoara, 2005, ISBN 973-661-556-1, 256 pages (published in Romanian)
4. Benea, M., C., Petroman, I., *Basis of tourism*, "Mirton" Publishing House, Timişoara, 2005, ISBN 973-661-671-1, 196 pages (published in Romanian)
5. 3. Benea, M., *Chemistry –laboratory copybook*, II-nd Edition, "Mirton" Publishing House, Timişoara, 2005, ISBN 973-661-711-4, 60 pages (published in Romanian)
6. Miklos, I., Miklos, I., Zs., *Machine components. Mechanical transmissions*, "Mirton" Publishing

House, Timişoara, 2005, ISBN 973-661-659-2, 143 pages (published in Romanian)

7. Maksay, Ş., Stoica, D., *Calculus of probabilities,* "Politehnica" Publishing House, Timişoara 2005, ISBN 973-625-213-2, 150 pages (published in Romanian)
8. Mechanical Department Team, *Fundamental and specialty disciplines – Synthesis*, " Mirton" Publishing House, Timişoara, 2005, ISBN 973-661-634-7, 605 pages (published in Romanian)

PUBLISHED PAPERS

1. Benea, M., C., *Approche operationnelle des indicateurs du tourisme durable dans les pays en developpement,* International Conference „The binomial bareness-wealth and integration of Romania in the European Union", Sibiu, ISBN 973-739-101-2, volume III, pp. 29-36
2. Benea, M., C., *Group that work, The X-th session of scientific communications with international attendance*, „Leadership and management at horizon of the XXI-th century", Sibiu, "Academia Forţelor Terestre" Publishing House Sibiu, ISBN 973-7809-29-7, pp. 141-148
3. Kiss, I., Maksay, St., T*he optimal form of moulding in the case of the semi-hard cast nodular iron rolls harness's,* "Masinstvo" – Journal of Mechanical Engineering, No.1/2005, Zenica, Bosnia & Herzegovina, pp. 17-22
4. Kiss, I., Maksay, S., *The triple correlation theory and optimal form of molding in the case of the semi-hard cast iron rolls harness's,* "Metalurgia International" Revue, No. 2 / 2005, Bucharest, pp. 14-21
5. Kiss, I., Maksay, S., *Optimization model and modeling in matlab area in the case of ductile cast irons,* "Metalurgia International" Revue, No. 3 / 2005, Bucharest, pp. 28-34
6. Kiss, I., Riposan, I., Maksay, S., *Some mathematical interpretations in the area of cast iron cylinders,* Annals of the Faculty of Engineering Hunedoara, 2005, Tome III, Part 2, pp. 193-200
7. Găvănescu, A., Nicolae, M., *The refining of steel by synthetic slag treatment,* Scientific Bulletin of the UPB, Series B, Vol. 67, No. 2, pp. 63-71
8. Puţan, V., *Modeling and simulation for thermal stratification of the liquid alloy in the casting ladle during the period of down-time,* The V-th National Conference with international attendance "Professor Dorin Pavel – founder of the Romanian Hydro-energetics", Sebeş 2005, Vol. VIII, pp. 339-346
9. Vîlceanu, L., *Analitical study on state of stress for contact between steel rope's wires,* The V-th National Conference with international attendance "Professor Dorin Pavel – founder of the Romanian Hydro-energetics", Sebeş 2005, Vol.VII, pp. 559-566
10. Popa, E., Kiss, I., Danciu, A., *Research and experiments, the influence of casting parameters upon the surface temperature of the continuos cast - semiproduct,* Annals of the University in Oradea, 2005, pp. 141-144
11. Popa, E., *Considerations on the mass transfer in and above the layer of casting powder, in the crystallizing vessel of the continuous casting machine,* International materials – New horizons and processing techniques, Timişoara, 2005, pp. 143-146
12. Popa, E., *Experimental results on influence of casting parameters on continuous cast semi-finished steel products' temperature,* The X-th Session of scientific communications with international attendance: Leadership and Management at horizon of the XXI-th century, Sibiu 2005, pp. 286-29
13. Ardelean, E, Ardelean, M., Socalici, A., Josan, A., *The effects of operational parameters on secondary solidification of continuous cast semifinished parts,* "Metalurgia Internaţional" Revue, No. 3, 2005, pp. 35-41
14. Ardelean, E., *The influence of technological work parameters on primary solidification of semifinished parts obtained by continuous casting*, "Metalurgia Internaţional" Revue, No. 1, 2005, pp. 15-21
15. Ardelean, E, Socalici, A., Hepuţ, T., Ardelean, M., *Research regarding the temperature influence on continuous casting process,* Scientific Bulletin of the "Politehnica" University in Timişoara, Vol. 50(64), 2005, pp. 137-142
16. Ardelean, E., *Research on thermal regime of steel making and continuous casting*, X-th Session of scientific communications with international attendance: Leadership and Management at horizon of the XXI-th century, Sibiu, 2005, pp. 270-277
17. Iagăr, A., Pănoiu, C., Abrudean, C., *The influence of the crucible induction furnaces upon the power supply network,* DEMI 2005, 7th International Conference on Accomplishments of Electrical and Mechanical Industries, Banjaluka, Yugoslavia, 27-28 May 2005, pp. 451-458
18. Iagăr, A., Abrudean, C., *Optimization of volume induction heating process of steel ingots*, 5th International Conference on Electromechanical

and Power Systems, Oct. 6-8 2005, SIELMEN 2005, Chisinau, Moldavia, pp. 929-932

19. Popa, G., N., Popa, I., Deaconu, S., *Solutions for electric power supply and automation of plate electrofilters*, Revue of automation and instrumentation, No.1, Bucharest, 2005, pp. 17-20

20. Popa. G., N., Popa, I., Deaconu, S., *The Study of Corona Currents for an Electrostatic Discharge System*, 7th International Conference on Accomplishments of Electrical and Mechanical Industries, section Mechanics and Constructions, DEMI 2005, Banja-Luka, 2005, pp. 127-132

21. Popa, G., N., Popa, I., Deaconu, S., *Complex Electronic Protection of the Low-Voltage Three Phase Induction Motors*, 11th International Conference on Electrical Machines, Drives and Power Systems, section Electrical Machines II, ELMA 2005, Sofia, Bulgaria, 2005, pp. 53-58

22. Popa, G., N., Diniş, C., Abrudean, C., Tirian, O., *Simulations and Measurements of Some Parameters from Plate-Type Electrostatic Precipitators*, 11th International Conference on Electrical Machines, Drives and Power Systems, section Technologies, New Materials and Components II, ELMA 2005, Sofia, Bulgaria, 2005, pp. 382-387

23. Popa, G., N., Popa, I., Deaconu, S., Diniş ,C., Iagăr, A. *Electrostatic Charged of Dust Particles in Industrial Plate-Type Electrostatics Precipitators*, 5th International Conference on Electromechanical and Power Systems, Vol. II, SIELMEN 2005, Chişinău, Moldavia, pp. 764-766

24. Popa, G.,,N., Popa, I., Deaconu, S., *Dust Particles Migration and Deposition in Plate-Type Electrostatic Precipitators*, 5th International Conference on Electromechanical and Power Systems, Vol. II, SIELMEN 2005, Chişinău, Moldavia, pp. 767-769

25. Popa, G., N., Popa, I., Deaconu, S., Abrudean, C., Tirian, O. *Modeling of voltage-current characteristics for plate electrofilters*, V-th National Conference with international attendance "Professor Dorin Pavel – founder of the Romanian Hydro-energetics", Science and Engineering, Vol. VII, Sebeş, 2005, pp. 273-278

26. Popa, I., Popa, G., N., Deaconu, S., *Analytical Method of the Start Time of Three-Phase Induction Motors with Resistance Torque Dependent by Square Speed*, 7th International Conference on Accomplishments of Electrical and Mechanical Industries, section Thermotechnique and Energetics, DEMI 2005, Banja-Luka, 2005, pp. 459-464

27. Popa, I., Popa G., N., Deaconu, S., Nekula, F., *Time electronic relays with different functions, accomplished with transistors*, V-th National Conference with international attendance "Professor Dorin Pavel – founder of the Romanian Hydro-energetics", Science and Engineering, Vol. VII, Sebeş, 2005, pp. 279-284

28. Diniş, C., *Simulation of material processing in a sintering heat using the Fuzzy logic*, Mining Revue No. 5 (167)/2005, ISSN 1220-2053, 2005, pp. 27 – 36

29. Diniş, C., *Modeling and Management of sintering processes using Fuzzy Logic*, 7th International Conference on Accomplishments of Electrical and Mechanical Industries, Banjaluka, DEMI 2005, 27-28 May, pp. 349-356

30. Diniş, C., Pop, E., Leba, M., *Software-oriented controller for hierarchical management of materials transportation process in sintering plants*, 5th International Conference on Electromechanical and Power Systems, SIELMEN 6-8 of October 2005 Chişinău, Moldavia, Vol. 2, pp. 687-691

31. Iordan, A., *Educational software for presentation of binomial distribution and its applications to define stohastical textures*, X-th Session of scientific communications with international attendance: Leadership and Management at horizon of the XXI-th century, Sibiu, 24-26 November 2005, Volume XII, pp. 192-199

32. Iordan, A., *Software for complex numbers' presentation and their applications in geometry*, X-th Session of scientific communications with international attendance: Leadership and Management at horizon of the XXI-th century, Sibiu, 24-26 November 2005, Vol. XII, pp. 200-207

33. Deaconu, S., Popa, G., N., Popa, I., *Reducing the energetic consumption for dry dedusting installation of the Electric Arc Furnaces*, V-th National Conference with international attendance "Professor Dorin Pavel – founder of the Romanian Hydro-energetic", Sebeş, 2005, pp. 285-288

34. Deaconu, S., Popa, G., N., Popa, I., *Increasing the operational safety and efficiency for energetic groups of steam power plants*, SIG-2005, Sinaia, 2005, pp. 540-543

35. Deaconu, S., Tutelea, L., Popa, G., N., Popa, I., *The influence of magnetic saturation towards the induced voltage for homopolar synchronous generator*, SIELMEN, Chişinău, 2005, pp. 783-786

36. Deaconu, S., Popa, G., N., Popa, I., *Hydroelectric power-plants optimal operation in cascade configuration*, DEMI, 27-28 May, Banja Luka, 2005, pp. 489-492

37. Deaconu, S., Popa, G., N., Popa, I., *Modern acuator systems for disc saws used in roll mills*, Universitaria SIMPRO, Petroşani, 2005, pp. 60-61

38. Deaconu, S., Popa, G.N., Popa, I., *Variable speed induction generators connected to the grid or in island mode operation*, ELMA, Sofia, 2005, pp. 403-404

39. Deaconu, S., Tutelea, L., *Experimental identification of the ideal regime at the induction machine*, Annals of the Faculty of Engineering Hunedoara, Tom III, Part 2, Hunedoara, 2005, pp. 173-178

40. Muscalagiu, I., *The Effect of Flag Introduction on the Explosion of Nogood Values in the Case of ABT Family Techniques*, 4th International Central and Eastern European Conference on Multi-Agent Systems (CEEMAS'05), Budapest, Hungary, September 15-17, 2005, Proceedings Spring Verlang, LNAI Series, vol. 3690, pp. 286-289

41. Pinca Bretotean, C., Kiss, I., Hepuţ, T., Tirian G.O., *Experimental Researches upon the durability in exploitation of the hot rolling mill cylinder*, 9th International research/expert conference Trends in the development of machinery and associated technology TMT – 2005, Turkey, vol I, pp. 411-418

42. Pinca Bretotean, C., Tirian, G.O., *Investigation methods for endurance of rolls for hot rolling mills*, Session of Scientific Communications NavMarEdu 2005, Constanţa, pp. 91-94

43. Dascăl, A., *Experimental tests meant to determine the Brinell hardness at high temperatures*, V-th National Conference with international attendance "Professor Dorin Pavel – founder of the Romanian Hydro-energetic" Şebeş, 2005, ISBN 973-720-015-0, pp. 613-618

44. Dascăl, A., *Study of material behavior at high temperatures in a steam boiler economizer*, Vth National Conference with international attendance "Professor Dorin Pavel – founder of the Romanian Hydro-energetic", Şebeş, 2005, ISBN 973-720-016-0, pp. 607-612

45. Dascăl, A., Jitian, S., *The shock bending of 12MoCr90 steel under high temperatures*, BRAMAT 2005 - International Conference on Materials Science and Engineering, Braşov, 2005, ISBN 973-635-454-7, paper no O1C3

46. Dascăl, A., Pinca Bretotean, C., Kiss, I., *The behavior of the hardness tests of 16Mo3 steel under high temperatures*, BRAMAT 2005, International Conference on Materials Science and Engineering, Braşov 2005, ISBN 973-635-454-7, paper no O1C2

47. Dascăl, A., Maksay, S., Pinca Bretotean, C., Hepuţ, T., *Numerical research on optimizing the chemical composition for OLT 35K steel with a view to obtaining superior mechanical features at high temperature*, "Metalurgia" Revue No. 6, 2005, pp. 30-36

48. Dascăl, A., Ardelean, M., *Aspects regarding to the behavior at heating of materials - component of a steam boiler*, Annals of the ORADEA University, Part of Management and Technological Engineering, CD-ROM Edition Vol.IV (XIV), 2005-08-05, ISSN 1583-0694, pp. 39- 46

49. Dascăl, A. *Experimental researches on how OLT 35K steel deals with high temperature*, "Metalurgia Internaţional" Revue Vol. X, 2005, No. 4, pp. 19-24

50. Lemle, L., D., Jiang, Y., *Note on Hille-Yosida theorem*, Works of the „UNIVERSITARIA SIMPRO 2005" International Multi-disciplinary Scientific Symposium, "Universitas" Publishing House, Petroşani, 2005, pp. 27-30

51. Lemle, L.D. *Une étude comparative concernant les semi-groupes de classe* C_0 *et les semi-groupes intégrés*, Lecturas Matemáticas, 26, 2005, pp. 35-96

52. Petrila, T., Maksay, S., *A New Numerical Approach of a Sliding Boundary Layer*, International Journal Computers and Mathematics with applications, Volume 50, Issues 1-2, July 2005, pp. 113-121

53. Stoica, D., Maksay, St., Podaru V., *Considerations about Cauchy modeling truncated*, 31st International Attended Scientific Conference „Modern Technologies in the XXI Century", "Academia Tehnică Militară" Publishing House, Bucharest, 2005, ISBN 973-640-074-3, pp. 151-155

54. Stoica, D., Maksay, St., *Considerations about exponential modeling truncated*, Works of the „UNIVERSITARIA SIMPRO 2005" International Multi-disciplinary Scientific Symposium, "Universitas" Publishing House, Petrosani, pp. 39-42

55. Weber, F., *Refrigerating enclosure used at Brinell hardness test in conditions of low temperatures*, Science and Engineering, AGIR Publishing House, Bucharest, 2005, ISBN 973-720-015-2, Vol. 7, pp. 571-576

56. Weber, F., *Experimental analysis of thermal transfer in samples at low temperatures*,

Science and Engineering, AGIR Publishing House, Bucharest, 2005, ISBN 973-720-015-2, Vol. 7, pp. 577-582

PhD THESIS

1. Mihuţ, C.G., *Optimizing the bimetal casting technology of high diameter rolls for rolling mills*
2. Puţan, V., *Studies on hydrodinamics and thermal regime of alloy at the level of casting ladles*
3. Kiss, I., *Research on improving the quality of rolls for rolling mills that are cast from nodular graphite iron*
4. Găvănescu, A., *Research on influence of using synthetic lime aluminum slags on steel purity*
5. Iagăr, A., *Contributions regarding to modeling and leading of induction heating electrotechnology*

PERSPECTIVES, INTERESTS, STRATEGIC PRIORITIES

- Research development for continuous casting products;
- Waste recycling;
- Improvement of plastic deformed steel products' quality (by rolling, forging, thermal treatment);
- Environmental protection;
- Development of some mathematical models 2D and 3D based on MDF, and of some simulating programs able to allow numerical control of induction heating for complex shape parts;
- Projecting a numerical control system for heating in volume/ superficial hardening of steel parts;
- Making compatible the induction heating installations that are supplied at industrial frequency;
- Conceiving a controller in real time and a software according to the intelligent command of a complex system of conveying belt in a sintering plant;
- Improvement of ABT Technique performances through introducing the message management ;
- Electrical parameters' analysis from electromagnetic compatibility point of view, for different consumers;
- Utilization of purchasing plates, development plates with micro-controller and some automatic programming machines to measure and command some industrial processes;
- Theoretical and experimental study of electrofilters with industrial plates;
- Accomplishing new sizing methods for electric installations of different configurations;
- Accomplishing of new electronic protections used for low voltage electric engines;
- Utilization of programming automatic machines to command some industrial processes;
- Research on aeolian electric plants;
- Implementation of a virtual information system assigned to interactive study and in the field of data structures and programming modern techniques;

RESEARCH TEAMS

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

- Prof.dr.eng. Teodor Hepuţ
- Lect.dr.eng. Doina Petre
- Lect.dr.eng. Erika Ardelean
- Lect.dr.eng. Virginia Socalici
- Lect.dr.eng. Vasile Puţan
- Lect.dr.eng. Ana Josan

2. Research of materials, plastic deformations and thermal treatments

- Prof.dr.eng. Ioan Ilca
- Lect.dr.eng. Isidor Prejban
- Lect.dr.eng. Gabriela Mihuţ
- Lect.dr.eng. Sorin Raţiu
- Assist.eng. Erika Popa

3. Reduction of material and energy specific consumption in iron and steel industry and other branches.

- Prof.dr.eng. Ioan Ilca
- Prof.dr.eng. Teodor Hepuţ
- Lect.dr.eng. Isidor Prejban
- Lect.dr.eng. Lucia Vîlceanu
- Lect.dr.eng. Doina Petre
- Lect.dr.eng. Laura Benea

4. New technologies of producing composite materials and metal powders.

- Prof.dr.eng. Teodor Hepuţ
- Lect.dr.eng. Erika Ardelean
- Lect.dr.eng. Vasile Puţan
- Assist.dr.eng. Imre Kiss

5. Recycling of ferrous and non-ferrous waste in iron and steel industry and other branches.

- Prof.dr.eng. Teodor Hepuţ
- Lect.dr.eng.. Virginia Socalici
- Lect.dr.eng. Vasile Puţan
- Assist.dr.eng. Adrian Găvănescu
- Assist.dr.eng. Imre Kiss

6. Environmental protection in iron and steel industry and other fields of pollution.

- Prof.dr.eng. Teodor Hepuţ
- Lect.dr.eng. Erika Ardelean
- Lect.dr.eng. Virginia Socalici
- Lect.eng. Marius Ardelean
- Assist.dr.eng. Adrian Găvănescu

7. Numerical modeling and control of induction heating electrotechnology.

- Lect.dr.eng Angela Iagăr

- Lect.dr.eng. Caius Pănoiu
- Lect.dr.eng Nicolae Rusu
- Lect.dr.eng. Sorin Deaconu
- Assist.eng. Cristian Abrudean

8. Artificial Intelligence, Distributed Programming. Multi-agent Systems, Programming with Distributed Constraint (DCSP- Distributed Constraint Satisfaction Problem)

- Lect.eng. Ionel Muscalagiu
- Lect.dr.eng. Vidal Jose Vidal
- Lect.dr.eng. Manuela Panoiu
- Lect.dr.eng. Horia Emil Popa

9. Improving the performances of electrofilters with industrial plates

- Lect.dr.eng.Iosif Popa
- Lect.dr.eng. Sorin Deaconu
- Lect.dr.eng. Corina Diniş
- Lect.dr.eng. Angela Iagăr
- Assist.eng. Cristian Abrudean
- Asist.eng. Ovidiu Tirian

10. Physics of nano-particles disperse systems – methods and models of simulation

- Lect.dr.eng. Mihaela Osaci
- Lect.eng. Ionel Muscalagiu
- Lect.dr.eng. Manuela Panoiu
- Assist.eng. Cristian Abrudean
- Assist.eng. Anca Iordan

11. Research on implementation of systems based on virtual reality and applications of educational software

- Lect.dr.eng. Manuela Pănoiu
- Lect.dr.eng. Caius Pănoiu
- Lect.eng. Ionel Muscalagiu
- Lect.dr.eng. Mihaela Osaci
- Lect.eng. Adela Berdie
- Assist.eng. Anca Iordan
- Assist.eng. Sorina Şerban

12. Thermal fatigue of rolls for rolling mills. Endurance of rolls for rolling mills

- Lect.dr.eng. Camelia Pinca Bretotean
- Lect.dr.eng. Ana Josan
- Lect.dr.eng. Gabriela Mihuţ
- Lect.dr.eng. Sorin Raţiu
- Assist.eng. Cristina Miklos
- Assist.eng. Ovidiu Tirian
- Assist.eng. Imre Kiss

13. Processing in semi-solid status of metal alloys

- Lect.dr.eng.. George Vasile Cioată
- Lect.dr.eng. Vasile Alexa
- Assist. dr. eng. Imre Kiss
- Assist. eng. Cristina Miklos
- Assist. Daniela Stoica

14. Increasing the life span of metallurgical equipment

- Lect.dr.eng. Teodor Vasiu
- Prof.dr. Ştefan Maksay
- Lect.dr.eng. Carmen Alic
- Lect.dr.eng. Imre Miklos
- Lect.dr.eng. Imre Zsolt Miklos
- Assist.eng. Adina Budiul Berghian

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