DEPARTMENT OF ELECTRICAL DRIVES AND MECHATRONICS

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1 DEPARTMENT'S PROFILE

The Department is responsible for education and research in electrical engineering in fields of power and industrial electronics, electrical machines and apparatus, controlled electrical drives and electromechanical systems, in automation of electrical equipment and in mechatronic systems. The Department offers both types of undergraduate courses (master and bachelor courses) as well as the Ph.D. postgraduate course.

2 STAFF

Professors: prof. Ing. Jaroslav Timko, CSc.
prof. Ing. Ladislav Zboray, CSc.




Associate Professors:	doc. Ing. Jaroslav Dudrík, CSc.	
	doc. Ing. Viliam Fedák, CSc.	
	doc. Ing. Jozef Fedor, CSc.	
	doc. Ing. Pavol Fedor, CSc.	
	doc. Ing. Ján Fetyko, PhD.	
	doc. Ing. Michal Kostelný, CSc.	
	doc. Ing. Irena Kováčová, CSc.	
	doc. Ing. Pavel Záskalický, PhD.	
Assistant Professors:	Ing. František Ďurovský, CSc.	Ing. Stanislav Fedor
	Ing. Želmíra Ferková, CSc.	Ing. Ján Kaňuch
	Ing. Bartolomej Fedor, CSc.	Ing. Juraj Németh
	Ing. Rastislav Harčarufka	Ing. Jaroslava Žilková, PhD.
	Ing. Vladislav Maxim, CSc.	Ing. Daniela Perduková, CSc.
Senior Scientists:	Ing. Katarína Harčarufková	Ing. Emanuel Hutník
	Ing. Peter Višnyi, CSc.	
Technical Staff:	Katarína Gočová	Alena Jakabová
	Ing. Vasiľ Graban	Zuzana Olexová
Ph.D. Students:	Ing. Martin Borbeľ	Ing. Slavomír Seman
	Ing. Stanislav Kron	Ing. Vladimír Slanina

3 EQUIPMENT

3.1. Teaching and Research Laboratories

- two laboratories for teaching of subjects on electrical engineering fundamentals
- three specialized laboratories for power electronics, one for electronics
- three laboratories for CAD design and simulation in electrical drives, power electronics and electrical machines (ANSYS, MATLAB, PSpice, and applied SW)
- two specialized laboratories for electrical drives and servosystems based on industrial systems
- three specialized laboratories for electrical machines and apparatus

3.2. Special Measuring Instruments and Equipment

Control Systems

- Modicon TSX Premium (Schneider Electric) incl. development SW (PL7 Pro V3.1)
- OMRON – Sysmac Mini SK20, OMRON – Sysmac CQM 1
- Allen Bradley Programmable controller SLC 200 incl. development SW RS logic 500, Tech. Terminal AB PanelView 550 and converter AB 1305

Apparatus

- Logic Analyser PHILIPS
- DOMINOPUTER – teaching kit

Converters

- Frequency Converter ABB ACS 140, 5,5 kW, RLLK 101 (EVÚ Nová Dubnica)
- DC Converters SIEMENS: SIMOREG 6RA24, 6RA70

- AC Converters SIEMENS: SIMOVERT 6SE21, MicroMaster Junior, SIMOVERT 6SE70 Master drive, 6SE70 Master Drives - Motion Control 2-axes servodrive
- DC thyristor converters SIMOREG 6RA24 a 6RA70 DCMaster (SIEMENS)
- Automat LOGO, Siemens
- Softstarter (ABB)
- Ward-Leonard driving system

4 TEACHING

4.1. Undergraduate Study (Bc.)

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Technical Documentation in El. Engineering	1st	2/1	Ďurovský
Electrical Machines	3rd	3/3	Kostelný
Power Electronics I.	3rd	3/3	Dudrík
Digital Control Techniques	3rd	2/3	Fedor, P. , Fedor, S.
Applied SW in Electrical Engineering	3rd	1/3	Dudrík, Fedák
Electrical Machines and Apparatus	4th	3/3	Kostelný, Fedor, J.
Power Electronics II.	4th	3/3	Dudrík
Automation of Electrical Equipment	4th	3/3	Fedor, P.
Electrical Drives	4th	3/3	Timko
Automated Electrical Drives I.	5th	3/3	Fetyko
Power Semiconductor Systems I.	5th	3/3	Ondera
Control Systems in Power Electronics	5th	2/2	Dudrík, Višnyi
Electrical Equipment for Vehicles	5th	2/2	Ďurovský
Robots and Manipulators	5th	2/2	Fetyko
Automated Electrical Drives II.	6th	3/3	Fetyko
Power Semiconductor Systems II.	6th	3/3	Ondera
Design of Electrical Drives	6th	2/2	Maxim
Industrial Drives	6th	2/2	Ďurovský
Fundamentals of Mechatronics	6th	2/3	Fetyko

4.2. Graduate Study (Ing.)

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Electrical Machines I.	5th	3/3	Kostelný
Components of Digital Control Systems	5th	2/2	Fedor, P. , Perduková
Electromechanical Systems	5th	2/2	Fedák, Fetyko

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Power Electronics	6th	3/3	Dudrík
Electrical Apparatus	6th	3/2	Fedor, J.
Electrical Machines II.	6th	3/3	Kostelný
Control Systems Software	6th	2/3	Fedor, P.
Mechatronics Fundamentals	6th	2/3	Fetyko
Electrical Drives	7th	3/3	Timko
Automation of Electrical Equipment	7th	3/3	Fedor, P.
State Control of Electrical Drives	7th	2/3	Zboray
Industrial Systems Identification	7th	2/3	Fedák
Control Circuits for Power Electronics	7th	2/3	Dudrík, Višnyi
Computer Aided Design	7th	2/3	Záskalický
Electrical Machines Design	7th	3/2	Ferková
Electrical Equipment for the Vehicles	7th	2/2	Ďurovský
Applied SW in Electrical Engineering	7th	1/3	Dudrík, Fedák
User Interfaces in Control Systems	7th	2/2	Fedor, P. , Perduková
Controlled Drives	8th	3/3	Zboray
Electrical Apparatus Construction	8th	2/3	Fedor, J.
Electrical Drives Design	8th	2/3	Maxim
Complex Drive Systems	8th	2/3	Fedák
Control Systems for Electrical Drives	8th	2/3	Fedor, P.
Power Semiconductor Converters	8th	2/3	Ondera
Computer Aided Design	8th	0/2	Fedor, S.
Control Electronics Laboratory Practice	8th	0/2	Fedor, S.
Master Thesis Workshop	9th	0/5	supervisor
Special El. Machines and Apparatus	9th	3/2	Kostelný, Fedor, J.
Semiconductor Converters Applications	9th	2/3	Ondera
Control Systems of Technological Lines	9th	2/3	Fedor, P.
Control of Robots and Manipulators	9th	2/3	Fetyko
Industrial Drives	9th	2/3	Fetyko, Ďurovský
Digital Control of Converters	9th	2/2	Višnyi
Neural and Fuzzy Control of El. Drives	9th	2/2	Timko
Master Thesis (Diploma Work)	10th	0/8	supervisor

4.3. Undergraduate and Graduate Study for Foreign Students (In English Language)

Subject	Lectures/exercises (hours per week)	Name of lecturer
Electrical Machines I.	3/3	Záskalický
Electromechanical Systems	2/2	Fedák, Fetyko
Power Electronics	3/3	Dudrík
Electrical Apparatus	3/2	Fedor J.
Electrical Machines II.	3/3	Záskalický
Mechatronics Fundamentals	2/3	Fetyko
Electrical Drives	3/3	Fedák
Automation of Electrical Equipment	3/3	Fedor, P. , Perduková
State Control of Electrical Drives	2/3	Zboray
Industrial Systems Identification	2/3	Fedák
Control Circuits for Power Electronics	2/3	Dudrík, Višnyi
Electrical Equipment for the Vehicles	2/2	Ďurovský
Applied SW in Electrical Engineering	1/3	Dudrík, Fedák
Controlled Drives	3/3	Zboray
Complex Drive Systems	2/3	Fedák
Power Semiconductor Converters	2/3	Dudrík
Master Thesis Workshop	0/5	supervisor
Semiconductor Converters Applications	2/3	Dudrík
Control of Robots and Manipulators	2/3	Fetyko
Industrial Drives	2/3	Fetyko, Ďurovský
Master Thesis (Diploma Work)	0/8	supervisor

5 RESEARCH PROJECTS

- *Application of Artificial Neural Networks and Fuzzy Logic in Control of Industrial Plants*, Scientific grant agency project (S.G.A.) No. 1/6253/99
- *Power High-frequency Indirect Converters with Soft Switching*, S.G.A. project No. 1/6110/99
- *Modern Methods of Analysis and Synthesis for Multi-motor Mechatronic Systems*, S.G.A. project No. 1/6056/99
- *Compensation and Activation of Centrifugal Forces in Vibration Equipment using Electrical Drive*, S.G.A. project No. 1/6052/99
- *Design of Reluctance Machines with Unsymmetrical Structures*, S.G.A. project No. 5004/98
- *Robust Control of Electrical Drives*, Institutional project of FEI TU Košice No. 4422
- *Shape Memory Devices Used as Actuators in Relays and Circuit Breakers*, Institutional project of FEI TU Košice No. 4409

- *New Trends Application in Andragogic*, Institutional project of FEI TU Košice No. 4408

6 CO-OPERATION

6.1. Co-operation In Slovakia

The Department co-operates with many industrial enterprises In Slovakia having joint project at modernising the electrical drives and control applications: US STEEL Košice, SIEMENS, ABB, BSH Drives and Pumps Michalovce, Křižík Prešov, Schneider Electric Slovakia, Spell Procont Prešov, Vonsch Podbrezová, TEKO Košice.

6.1.1. Visitors to the Department

Within framework of the EDPE 01 Int. Conference the participants from abroad visited the department (on 2 October): Prof. István Nagy (Budapest University of Technology and Economics), Dr. Ing Joe Cilia and Dr. Ing. Cyril Spiteri Staines (University of Malta). Further visitors:

- Assoc. Prof. Pavol Bauer, July 2001 within framework of the ELINA Leonardo da Vinci project
- Juha Kivioja – student University of Vaasa, Finland (3 months) – SOCRATES programme
- Daniel Trip, University of Oradea – a 6 months research stay based on Agreement on Co-operation between Romania and Slovakia

6.2. International Co-operation

Co-operation in the international project *Training in Electrical Engineering for Industry Automation – ELINA*, (Leonardo da Vinci Programme, SK/98/2/0538/PI/II.1.1.c/CONT) on Courses in EE for Industrial Automation with the partners: National Technical University of Athens, ENSEM Nancy, Delft University of Technology, Simulation Research – Aalphen an den Rijn, Brno Technical University, Slovak Chamber of Commerce and Industry, Křížik Prešov, VSZ Košice. The goal of the project consisted in preparation of the specialised courses from field of Electrical Engineering (topics on Computer Aided Design in Electrical Engineering and the Most Utilised SW in EE, Electrical Machines and Apparatus, Microelectronics, and Power Electronics, Electric Drives Systems and their Applications, Influence of Converters on Environment and Power Quality Improvement, Control of Technological Processes, Light Engineering, Electrical Heating). 27 different modules were developed In English within the range of 50 – 120 pages (totally 50 modules incl. languages of the partners: CZ, F, GR). The verification series of courses for industrial partners and other interested parties (SMEs) was organised and they will continue in 2002, too.

The department maintains intensive contacts with universities co-operating in previous international projects:

- University of Miskolc
- Napier University of Edinburgh
- Politecnico di Torino
- Universidad Politecnica de Valencia

6.2.1. Visits of Staff Members to Foreign Institutions

- Fetyko, J.: University of Miskolc, 22 February 2001. Member of the examination committee for final exams.
- Perduková, D.: Prag, 15-17 March 2001. Training in Microsoft 2000.
- Harčarufková, K.: Prag, 15-17 March 2001. Training in Microsoft 2000 .
- Fedák, V.: Belgium and The Netherlands, 13-20 March 2001. Paricipation in the E=TeM2 Conf. on Tomorrow's Education in El. Technologies (Liege). Joint Co-ordinator Commiteee Meeting Elina (Delft).
- Harčarufka, R.: Prag, 5-7 April 2001. Consultations with Prof. M.Shott (Oxford University).
- Záskalický, P.: Wroclaw, 19-22 June 2001. Participation in the Int. Conference
- Hutník, E.: Vienna, 14-18 May 2001. Excursion with students.
- Fetyko, J.: Vienna, 14-18 May 2001. Excursion with students.
- Fedák, V.: INPL, Vandeouvre-les-Nancy, 29 May – 4 June 2001. Final Joint Co-ordinator Meeting in ELINA Leonardo da Vinci project (No 05381).
- Fedák, V.: Brno University of Technology, Czech Republic, 11-13 May 2001. Inspection of the Activities within framework the ELINA project.
- Ferková, Ž.: Žďárske Vrchy, 6-8 June 2001. Conference of the COSMOS users.
- Fetyko, J.: Plzeň, 11-13 June 2001. Participation in the Conf. on Electrical Drives.
- Hutník, E.: Budapest, 6 June- 7 July 2001. Mobility within the CEEPUS project.
- Kron, S.: Budapest, 6 June – 7 July 2001. Mobility within the CEEPUS project.
- Fetyko, J.: University of Miskolc, 20 June, 2001. Member of the final examination committee.
- Fedák, V.: Vienna-Graz, 25-31 August 2001. Participation in the EPE 2001 int. conference and in council meetings (EPE EC, EPE GA, EPE-PEMC-C).
- Ďurovský, F.: Rožnov pod Radhoštěm, 25-29 September 2001. Participation in Int. Conference "Steel Strip 2001".
- Fetyko, J.: Berlin, 21-25 October 2001. Participation in the 18th Int. Conference on Electrical Hybrid Vehicles, EHV 18. Granted by DAAD.
- Fedák, V.: Berlin, 21-25 October 2001. Participation in the 18th Int. Conference on Electrical Hybrid Vehicles, EHV 18. Granted by DAAD.
- Harčarufková, K.: Hradec Králové, 6-11 November 2001. Participation in the int.seminar on Implementation of the Distance Education at the Universities.
- Záskalický, P.: Praha, 22-25 November 2001. Consultations at the Czech Academy on Science on mutual collaboration.
- Fedák, V.: Brno, 18-20 December 2001. Introductory meeting to the INETELE project.

6.3. Membership in International Organizations, Societies and Committees

- Fedák, V.: Executive Council member of EPE, General Assembly member (European Power Electronics and Drives Association - Brussels)
- Fedák, V.; Timko, J.: Committee members of EPE-PEMC-C (Power Electronics and Motion Control Council - Budapest)

Members of the Programme and Steering Committees of the International Conferences

- 14th Int. Conf. on Electrical Drives and Power Electronics, EDPE 2001: Viliam Fedák (chairman), Jaroslav Dudrík (programme chairman), Jozef Fedor, Ján

Fetyko, Jaroslav Timko
- 11th Symposium on Power Electronics Ee 2001, Novi Sad, Yugoslavia: Viliam Fedák

6.4. Membership In Slovak Organizations and Societies

- Timko, J. (Vice-chairman); Fedák, V.; Fedor, J.; Zboray, L.: members of Joint Slovak Board for the Ph.D. Study in Electrical Engineering
- Ferková, Ž.: member of Technical Standards Commission on Electrical Machines
- Fedor, J.: Working Group member of Accreditation Committee at Ministry of Education of SR
- Fedák, V.; Fedor, J.; Fetyko, J.; Kaňuch, J.; Ondera, J.; Timko, J.; Záskalický, P.; Zboray, L.: members of SES (Slovak Electrotechnic Society)

6.5. Contracts, International Projects

Co-ordinator and Contractor in the Leonardo da Vinci project *Training in Electrical Engineering for Industry Automation – ELINA,* (SK/98/2/0538/PI/II.1.1.c/CONT).

Staff members are involved in the following international projects:

- Leonardo da Vinci SK/98/1/84002/PI/I.1.1.a - PROQUA (1998-2001).
- Leonardo da Vinci SK/98/1/84012/PI/III.1.a/FPI – ESPESIT (1998-2001).
- TEMPUS Phare IB_JEP-13423-98 – PATRISEA (1998-2001).
- SOCRATES ODL Observation Project No. 56619-CP-1-IT-ODL-ODL – MOISE (1998-2001).
- Tempus Phare IB_JEP- 14168-1999 - TRUE (1998-2001).
- Leonardo da Vinci Project SK/98/1/84000/PI/I.1.1d/CONT - FACE (1998-2001).
- Leonardo da Vinci Project IB_JEP-14337-99 – EXPO (1999-2001).
- Leonardo da Vinci Project SK/98/2/0502/PI/II.1.111.b/FPS – EDUCRATOS.
- Project I2DV – Internet innovation of distance learning.

7 THESES

7.1. Masters Theses

1. BAŇAS, M. *Steering of Points and Signalling Inerlocker at the Factory Siding of the Railway Transport VSŽ Company by a Free Programmable Controller*. (Perduková, D.)
2. BARTO, M. *Controlling Modules of Drives for a Programmable Controller*. (Fedor, P.)
3. BELEJKANIČ, V. *Fuzzy Controller for Automating Washing Machine with Adaptivity of the Drum*. (Fedor, S.)
4. BORBEĽ, M. *Estimation of the AC Drives by Artificial Neural Networks*. (Timko, J.)
5. HVOLKA, M. *Visualisation of the Events in the Monitoring Mode Within the Guarded Object*. (Fedor, S.)
6. IVANČÁK, M. *Control of DC Drive by Artificial Neural Network*. (Timko, J.)
7. JACEČKO, A. *Two-Phase Synchronous Motor for Drive of the Pump of the Washing Machine*. (Kostelný, M.)
8. JAHODA, P. *Perform an Analysis of the Drive of Washing Machine*. (Fedor, S.)
9. KOHAN, D. *Control of the Storage Tank of Loose Materials by a Logic Controller*

Schneider Modicon TSX and Corresponding Visualisation System. (Perduková, D.)
10. MATURKANIČ, M. *Frequency Converter Control by a Microcomputer*. (Ďurovský, F.)
11. MIHALČIN, P. *Control of a Vibration Mill*. (Ďurovský, F.)
12. MOTYKA, R. *Control of a School Robot MA 2000 by DSP*. (Fetyko, J.)
13. SIRÁŇOVÁ, A. *Electrical Machine for Driving the Mountain Bike*. (Kostelný, M.)
14. SLOVENČÁKOVÁ, J. *Analytical Calculation of the Reluctance Motor Currents and Torques*. (Záskalický, P.)
15. SVINČIAK, M. *Direct Torque Control of the AC Drive*. (Fedák, V.)
16. URAM-KOCURIŠIN, M. *Speed Control of AC Drive via a Variable Structure*. (Zboray, L.)
17. VARGA, S. *Digital Modelling of the Industrial Plants*. (Harčarufka, R.)
18. VOZÁR, M. *One-Phase Synchronous Machine for Drive of the Pump*. (Záskalický, P.)
19. ŽIAK, Ľ. *Methodology of the Control Applications Implementation*. (Harčarufka, R.)

7.2. Doctoral Theses

1. BALARA, D. *Identification of Electrical Drives Parameters by Artificial Neural Networks*. Supervisor: Prof. Jaroslav Timko. Defended at University of Žilina, February 2001.
2. ŽILKOVÁ, J. *Artificial Neural Networks Application in Estimation of Asynchronous Motor Variables*. Supervisor: Prof. Jaroslav Timko. Defended at University of Žilina, February 2001.

8 OTHER ACTIVITIES

- *14th International Conference on Electrical Drives and Power Electronics, EDPE 2001* organised by the Department jointly with Slovak Electrotechnical Society in the Hotel Permon, the High Tatras on 3-5 October. More than 125 participants from 22 countries of all continents took part there. Altogether 84 papers were read in 3 keynote sessions, 5 oral sessions, 3 dialogue sessions. The details are to be found in http://www.tuke.sk/edpe. It has been announced the following conference will be held in 2003.
- *High-Tech Workshop, Herľany 2001*. High-Tech (as the abbreviation of High-Technology) is the engineering workshop aimed to the informal exchange of ideas of teachers, students, graduates and colleagues from practise in the Learning and Training Centre of TU Košice in Herľany (www.gejzir.sk). This workshop - in year 2001 already 13th in order - is organised annually (mostly due the 1st weekend in May) and its programme includes vocational, sporting and social parts with very interesting presentations and discussions, amusing sporting and other disciplines, camp-fire, camp-singing, etc. For more information about this action see www.tuke.sk/hth .

9 PUBLICATIONS

9.1. Books

1. FEDOR, P.; PERDUKOVÁ, D. *Programmable Controllers in Electrical Drives*. Košice: Mercury-Smékal, 2001, 56 pages. ISBN 80-968550-0-X (In Slovak).

9.2. Journals

1. FEDOR, P.; PERDUKOVÁ, D.; TIMKO, J. Study of Controlled Structure Properties with Reference Model. In *Acta Techn. CSAV 46, Institute of Electrical Engineering Acad. Sci.* Czech Republic, 2001, pp. 167-179.
2. BALARA, L. Non-linear Control of Electrical Drive. In *AT&P Journal plus*, 2001, pp. 22-24. (In Slovak).
3. ZÁSKALICKÝ, P. Nonlinear Theory of Analysis Variable-Reluctance Motor Drives. In *Zeszyty naukowe politechniky slaskiej*, 2001, pp.243-250.
4. ZÁSKALICKÝ, P. Optimisation of the Excitation of Switched Reluctance Motor, In *Acta Electrotechnica et Informatica*, 2001, vol.1, no. 1, pp. 45-49. (In Slovak).
5. KOVÁČ, D.; KOVÁČOVÁ, I. Influence of Utilizing Static Power Semiconductor Convertors on Quality of Electrical Power Line Parameters. In *Quality Innovation Prosperity*, 2001, vol.3, no. 2, pp. 74-84. ISSN 1335-1745.

9.3. Textbooks

1. HARČARUFKA, R.; HARČARUFKOVÁ, K.; ŠKINÁROVÁ, J.; ŽÁKOVÁ, K. *Fundamentals in Internet*. STU Bratislava, 2001. ISBN 80-227-1569-7 (In Slovak).
2. HARČARUFKOVÁ, K.; HARČARUFKA, R.; PERDUKOVÁ, D. *We are Working with Computer*. 1st distance course for continuous education of the teachers. ISBN 80-7099-675-7 (In Slovak).
3. HARČARUFKOVÁ, K.; HARČARUFKA, R.; PERDUKOVÁ, D. *Internet Innovation in Distance Learning*. Instruction book, Study Programme for 12DV. Institute for the long-life education, TU Košice, October 2001. ISBN 80-7099-675-7 (In Slovak).
4. FEDOR, S. *Computer Support for Processing of Documentation in Electrical Engineering*. Mercury-Smékal, Košice 2001, 108 p. ISBN 80-968550-4-2 (Slovak version: ISBN 80-968550-6-9).
5. FERKOVÁ, Ž. *Solution of Electromagnetic Fields by Finite Element Method*. Mercury-Smékal, Košice 2001, 50 p. ISBN 80-968550-6-9 (Slovak version: ISBN 80-89061-23-0).
6. FEDOR, J. *Electrical Apparatus for Circuits Protection*. Košice: Mercury-Smékal, 2001, 78 p. ISBN 80-968550-9-3 (Slovak version: ISBN 80-89061-24-9).
7. VIŠNYI, P. *Course on Microprocessor Programming*. Košice: Mercury-Smékal, 2001, 88 p. ISBN 80-89061-02-8 (Slovak version: ISBN 80-89061-25-7).
8. DUDRÍK, J. *Power Semiconductor Devices*. Košice: Mercury-Smékal, 2001, 72 p. ISBN 80-89061-03-6 (Slovak version: ISBN 80-89061-26-5).
9. ZBORAY, L.; ĎUROVSKÝ, F.; FARID, M.T. *Control of AC Drives*. Košice: Mercury-Smékal, 2001, 88p. ISBN 80-89061-05-2 (Slovak version: ISBN 90-89061-05-2).
10. ĎUROVSKÝ, F. *Industrial Drives*. Košice: Mercury-Smékal, 2001, 66p. ISBN 80-

89061-07-9 (Slovak version: ISBN 80-89061-27-3).

11. ĎUROVSKÝ, F.; SEMAN, S. *Technical Documentation in Electrical Engineering*. Košice: Mercury-Smékal, 2001, 106 p. ISBN 80-89061-08-7 (Slovak version: ISBN 80-89061-28).
12. PERDUKOVÁ, D. *Technological Processes Visualisation*. Košice: Mercury-Smékal, 2001, 92 p. ISBN 80-89061-12-5 (Slovak version: ISBN 80-89061-30-3).
13. FEDOR, P. *Programming of Small Logic Controllers*. Košice: Mercury-Smékal, 2001, 90 p. ISBN 80-89061-13 (Slovak version: ISBN 80-89061-31-1).
14. FEDOR, P. *Fuzzy Logic Applications in Process Control*. Košice: Mercury-Smékal, 2001, 60p. ISBN 80-89061-14-1 (Slovak version: ISBN 80-89061-32-X).
15. ŽILKOVÁ, J. *Artifical Neural Networks in Process Control*. Košice: Mercury-Smékal, 2001, 88 p. ISBN 80-89061-15-X p (Slovak version: ISBN 80-89061-33-8).
16. ZBORAY, L.; BALARA, L. *State and Robust Control of Electrical Drives*. Košice: Mercury-Smékal, 2001,102 p. ISBN 80-89061-16-8 (Slovak version: ISBN 80-89061-34-6).
17. FEDOR, P. *Transducers for Industry Automation*. Košice: Mercury-Smékal, 2001, 102 p. ISBN 80-89061-17-6 (Slovak version: ISBN 80-89061-35-4).
18. BADIDA, M.; ANNA, V.; ZVIRINSKÝ, V.; MAXIM, V.; BADIDOVÁ, D. *Control of quality, safety in work and environment protection*. Leonardo da Vinci project, Košice: Faculty of Mech. Eng. of Technical University, 2001 (In Slovak).
19. MAXIM, V.; ZVIRINSKÝ, V.; ANNA, V. *Electrotechnics*. Leonardo da Vinci project, Faculty of Mech.Eng. of Technical University of Košice, 2001. (In Slovak).
20. KOVÁČOVÁ, I.; ŠIMKO, V. *Elektrotechnics*. Košice: Elfa s.r.o., 2001, 217 p. (In Slovak).
21. KOVÁČ, D.; KOVÁČOVÁ, I. *Analysis of Electric Circuits I.*, Košice: Akris, 2001, 112 p. ISBN 80-968666-1-3.
22. KOVÁČOVÁ, I.; KOVÁČ, D. *Applied Electronics – Instructions to the excercises in labs*, Košice: Akris, 2001, 94 p. ISBN 80-968666-0-5 (In Slovak).
23. KOVÁČOVÁ, I.; KOVÁČ, D. *Theoretical Electrotechnics II.*, Košice: Elfa s.r.o., 2001, 168 p. ISBN 80-88992-27-3 (In Slovak).
24. KOVÁČOVÁ, I.; ŠIMKO, V. *Theoretical Electrotechnics I.*, Košice: Elfa s.r.o., 2001, 174 p. ISBN 80-88964-34-2 (In Slovak).

9.4. Conferences

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