

DEPARTMENT OF ELECTRICAL DRIVES AND MECHATRONICS

<http://www.tuke.sk/fei-kep>

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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, electromechanical systems and esp. in controlled electrical drives, 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, PhD.
prof. Ing. Ladislav Zboray, PhD.

Associate Professors: doc. Ing. Jaroslav Dudrík, PhD.
doc. Ing. Viliam Fedák, PhD.
doc. Ing. Jozef Fedor, PhD.
doc. Ing. Pavol Fedor, PhD.
doc. Ing. Ján Fetyko, PhD.
doc. Ing. Michal Kostelný, PhD.
doc. Ing. Irena Kováčová, PhD.
doc. Ing. Pavel Zásalický, PhD.

Assistant Professors: Ing. František Ďurovský, PhD. Ing. Stanislav Fedor
Ing. Želmíra Ferková, PhD. Ing. Ján Kaňuch
Ing. Bartolomej Fedor, PhD. Ing. Juraj Németh
Ing. Rastislav Harčarufka Ing. Jaroslava Žilková, PhD.
Ing. Vladislav Maxim, PhD. Ing. Daniela Perduková, PhD.

Senior Scientists: Ing. Katarína Harčarufková Ing. Emanuel Hutník
Ing. Peter Višny, PhD.

Technical Staff: Katarína Gočová Alena Jakabová
Ing. Vasil' Graban Zuzana Olexová

Ph.D. Students: Ing. Martin Borbeľ Ing. Slavomír Seman
Ing. Stanislav Kron Ing. Vladimír Slanina
Ing. Ondrej Šimko

3 EQUIPMENT

3.1. Teaching and Research Laboratories

- two laboratories for teaching of subjects on electrical engineering basics
- three specialized laboratories for power electronics, one for electronics
- laboratory for CAD and CAE in electrical drives, power electronics and electrical machines (ANSYS, MATLAB, PSpice, and applied SW) – 10 x PC
- two specialized laboratories for electrical drives and servosystems based on industrial systems
- two specialized laboratories for electrical machines and one for electrical 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

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

Advanced teaching equipment

- DOMINOPUTER – teaching kit
- Educational Robot Tech Quipment MA 2000

4 TEACHING

4.1. Undergraduate Study (Bc.)

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Technical Documentation in El. Engineering	1 st	2/1	Žurovský
Electrical Machines	3 rd	3/3	Kostelný
Power Electronics I.	3 rd	3/3	Dudrík
Microprocessor Techniques	3 rd	2/3	Fedor, P., Perduková D.

Applied SW in Electrical Engineering	3 rd	1/3	Dudrík, Fedák
Electrical Machines and Apparatus	4 th	3/3	Kostelný, Fedor, J.
Power Electronics II.	4 th	3/3	Dudrík
Automation of Electrical Equipment	4 th	3/3	Fedor, P.
Electrical Drives	4 th	3/3	Timko
Automated Electrical Drives I.	5 th	3/3	Fetyko
Power Semiconductor Systems I.	5 th	3/3	Ondera
Control Systems in Power Electronics	5 th	2/2	Dudrík, Višnyi
Electrical Equipment for Vehicles	5 th	2/2	Ďurovský
Robots and Manipulators	5 th	2/2	Fetyko
Automated Electrical Drives II.	6 th	3/3	Fetyko
Power Semiconductor Systems II.	6 th	3/3	Ondera
Design of Electrical Drives	6 th	2/2	Maxim
Selected Industrial Drives	6 th	2/2	Ďurovský
Fundamentals of Mechatronics	6 th	2/3	Fetyko

4.2. Graduate Study (Ing.)

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Technical Documentation in El. Engineering	1 st	2/1	Ďurovský
Electrical Machines I.	5 th	3/3	Kostelný
Components of Digital Control Systems	5 th	2/2	Fedor, P. , Perduková
Electromechanical Systems	5 th	2/2	Fedák, Fetyko
Power Electronics	6 th	3/3	Dudrík
Electrical Apparatus	6 th	3/2	Fedor, J.
Electrical Machines II.	6 th	3/3	Kostelný
Control Systems Software	6 th	2/3	Fedor, P.
Mechatronics Fundamentals	6 th	2/3	Fetyko
Electrical Drives	7 th	3/3	Timko
Automation of Electrical Equipment	7 th	3/3	Fedor, P.
Semestral Project	7 th	0/2	Supervisor
State Control of Electrical Drives	7 th	2/2	Zboray
Industrial Systems Identification	7 th	2/2	Fedák
Control Circuits for Power Electronics	7 th	2/2	Dudrík, Višnyi
Computer Aided Design	7 th	2/2	Záskalický
Electrical Machines Design	7 th	2/2	Ferková
Electrical Equipment for the	7 th	2/2	Ďurovský

Vehicles			
Applied SW in Electrical Engineering	7 th	1/3	Dudrík, Fedák
Visualisation of Electrical Systems	7 th	2/2	Fedor, P., Perduková
Controlled Drives	8 th	3/3	Zboray
Electrical Apparatus Construction	8 th	2/3	Fedor, J.
Electrical Drives Design	8 th	2/3	Maxim
Complex Drive Systems	8 th	2/3	Fedák
Control Systems for Electrical Drives	8 th	2/3	Fedor, P.
Power Semiconductor Converters	8 th	2/3	Ondera
Computer Aided Design	8 th	0/2	Fedor, S.
Control Electronics Laboratory Practice	8 th	0/2	Fedor, S.
Semestral Project	8 th	0/2	supervisor
Master Thesis Workshop	9 th	0/5	supervisor
Special Electrical Machines and Apparatus	9 th	3/2	Kostelný, Fedor, J.
Semiconductor Converters Applications	9 th	2/3	Ondera
Control Systems of Technological Lines	9 th	2/3	Fedor, P.
Control of Robots and Manipulators	9 th	2/3	Fetyko
Selected Industrial Drives	9 th	2/3	Fetyko, Ďurovský
Digital Control of Converters	9 th	2/2	Višnyi
Neural and Fuzzy Control of El. Drives	9 th	2/2	Timko, Žilková
Master Thesis (Diploma Work)	10 th	0/8	supervisor

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

Subject	Lectures/exercises (hours per week)	Name of lecturer
Control Theory	2/2	Fedák
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
Measurement in El. and Power Eng.	2/3	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 of Vehicles	2/2	Maxim
System Identification	2/2	Fedák
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
Power Semiconductor Converters Applications	2/3	Dudrík
Electrical Drives Design	2/3	Maxim
Control of Robots and Manipulators	2/3	Fetyko
Selected Industrial Drives	2/3	Fetyko, Ďurovský
Master Thesis (Diploma Work)	0/8	supervisor

5 RESEARCH PROJECTS

- *Modern Methods of Identification and Control of Industrial Systems*, Scientific grant agency project (S.G.A.) No. 1/9033/02 (01.2002-12.2004)
- *Voltage and Current Power with High Efficiency and Decreased Feedback Influence*, S.G.A. project No. 1/9025/02 (01.2002-12.2004)
- *Modern Control Methods for Mechatronic Systems*, S.G.A. project No. 1/9277/02 (01.2002-12.2004)
- *Development of Special Electrical Machines for Industrial Automation*, S.G.A. project No. 1/8127/01 (01.2002-12.2004)
- *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, Křížik Prešov, Schneider Electric Slovakia, Spell Procont Prešov, Vonsch Podbrezová, TEKO Košice.

6.1.1. Visitors to the Department

- Assoc. Prof. Pavol Bauer (May 2002) - a series of lectures
- Daniel Trip, University of Oradea, Romania
- Marcin Szczygiel, Technical University of Silesia in Gliwice, (15 April – 12 May 2002) CEEPUS: PI-0119-01/02

- Xavier Lluch Cobo, Polytechnic University of Mataró, Spain (30 June –31 August 2002).

6.2. International Co-operation

The department maintains intensive contacts with universities co-operating in international projects (current and past ones):

- University of Miskolc
- Politecnico di Torino
- Institut National Polytechnique de Lorraine, Nancy
- University of Technology and Economy, Budapest
- Brno University of Technology
- Silesian University of Gliwice
- University of Maribor

6.2.1. Visits of Staff Members to Foreign Institutions

- Kostelný M.; Záskalický P.; Ferková Ž.; Kaňuch J.: Ostrava, Czech Republic, 22-24 January 2002. In. symposium of teachers of electrical machines.
- Fedor, P.: Viena, Austria, 20-26 January 2002. Training in the Control System Centrum CS 3000 Yokogawa.
- Fedák, V.: Zagreb, Croatia, 23-27 February 2002. Participation in the ISC of the EPE-PEMC 2002 Conference.
- Fedák, V.: Prague, Czech Republic, 25 March 2002. Participation in the seminar on Leonardo da Vinci programme.
- Fedor, P.: Ostrava, Czech Republic, 24-25 April 2002. Participation in the Int. Student Competition ŠTOČ '02.
- Hutník, E.; Ďurovský, F.: Viena, Austria, 15-18 April 2002. Visit with students of the SIEMENS Co. Fetyko, J.: Erlangen, Germany, 14-17 May 2002. Visit of the SIEMENS Co.
- Fedák, V.: Podgorica, 29 May –2 June 2002. Participation in the co-ordinator meeting of the TEMPUS project No JEP CD-16127-2001.
- Fedor, B.: Miskolc, Hungary, 7 June 2002
- Fedák, V.: Maribor, Slovenia, 8 June – 2 July 2002. Study stay granted by the CEEPUS project No PL-0119-01/02.
- Záskalický, P.: Kielce, Poland, 17-21 June 2002. Participation in the conference SYMEP '02.
- Fetyko, J.; Fedor, P.; Ďurovský, F.; Perduková, D.; Fedor, S.; Slanina, V.; Ferková, Ž.; Borbel', M.: Liberec, Czech Republic, 24-26 June 2002. Participation in the int. symposium of teachers of electrical drives, SYMEP '02.
- Záskalický, P.: Gliwice, Poland, 24 June–12 July 2002. Study stay granted by the CEEPUS project No PL-0119-01/02.
- Fedák, V.: Maribor, Slovenia, 3 July – 5 July 2002. Participation in the Int. Symposium on Advance Motion Control, AMC '02.
- Ferková, Ž.: Prague, Czech Republic, 10-13 September 2002. Participation in the ISEM '02 Int. Conference
- Ferková Ž.; Maxim V.: Liberec, Czech Republic, 12-15 September 2002. Co-operation with the TU Liberec.
- Fedák, V.: Dubrovnik-Cavtat, Croatia, 6-13 September 2002. participation in the Int. Conference EPE-PEMC 2002.

- Fedák, V.: Torino, Italy, 13-17 September 2002. Co-ordinator meeting of the TEMPUS project.
- Ferková, Ž.: Žďárske Vrchy, Czech Republic, 25-27 October 2002. 19th conference of the COSMOS Users.
- Slanina, V.: Praha, Czech Republic, 6-8 November 2002. MATLAB '02 Conference.
- Fetyko, J.: Miskolc, Hungary, 8 November 2002. Participation in the seminar.
- Ferková, Ž.: Brno, Czech Republic, 11-15 November 2002. Co-operation with the VUT Brno and participation in the Leonardo da Vinci meeting.
- Fedák, V.: Brno, Czech Republic, 13-17 November 2002. Co-ordinator meeting of the INETELE project (Leonardo da Vinci programme).

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

- ISC of the EPE-PEMC 2002: Fedák V.; Timko J.

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 in SR
- 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 The SES (Slovak Electrotechnic Society), Branch at FEEI TU Košice

6.5. Contracts, International Projects

The Department is a co-ordinating body in the Leonardo da Vinci project *Interactive and Unified E-Based Education and Training in Electrical Engineering – INETELE*, (No CZ/02/B/F/PP/ 134009). The objective of the project is to facilitate understanding and enhancement the studying in field of electrical engineering by teaching materials in electronic form with animated figures and interactive simulations. Target groups consist of students (secondary and university level), unemployed, disabled and all those who needs to refresh the knowledge from EE. Partnership consist of universities, chambers of commerce and industry, research institute and SME: Montanuniversität Leoben (A), Brno University of Technology (CZ), Institut National Polytechnique de Lorraine, Nancy (F), Budapest University of Economics and Technology (H), Silesian Technical University, Gliwice (PL), Delft University of Technology (NL), Slovak Chamber of Commerce and Industry (SK), Chamber of Commerce (CZ), Simulation Research (NL), Mercury-Smékal, Košice (SK). Duration of the project: 2001-2004. Co-ordinator: Fedák, V.

Staff members are also involved in the following international projects:

- TEMPUS JEP CD-16127-2001: Standardisation of Curriculum for Electrical Machines Using Multimedia
- Leonardo do Vinci: SK/02/B/P/PP/142256: Efficient E-Learning Network Services Establishment for Education without Borders
- CEEPUS PL-0119-01/02: Multimedia as Auxiliary Tool in Teaching and Learning of Electrical Engineering

7 THESES

7.1. Masters Theses (Ing. Study)

1. Križ, Š.: *Microcomputer Control of a Frequency Converter* (Ďurovský, F.)
2. Miľko, M.: *Replacement of the Dynamic System by Fuzzy System* (Perduková, D.)
3. Balogh, R.: *Possibilities of PC Support at Teaching in Power Electronics and Semiconductor Converters* (Ondera, J.)
4. Valent, M.: *Car Converter with High Efficiency and Output Power of 120 W* (Kováčová, I.)
5. Šimko, O.: *Simulation and Visualisation Model of Robot Movement Control* (Fetyko, J.)
6. Vícen, P.: *Fuzzy Addaptive Controllers for the Servodrives of Robots* (Fetyko, J.)
7. Mitruška, P.: *Estimation of State Variables of Electrical Drive with Linear Asynchronous Motor by Artificial Neural Networks* (Žilková, J.)
8. Biganič, P.: *Design of a Neural Controller for the DC Motor Drive* (Timko, J.)
9. Keresturi, M.: *Control of a Cran Drive* (Zboray, L.)
10. Malobický, M.: *Simulation of the Switched Reluctance Motor in the Pspice programme* (Maxim, V.)
11. Pelegrin, R.: *Model of the Switched Reluctance Motor $2p_1/2p_2=6/4$* (Ferková, Ž.)

Note: All theses are In Slovak.

7.2. Final Theses (Bc. Study)

1. Tuhársky, M.: *High-Frequency Transformer* (Ferková, Ž.)
2. Bohinský, K.: *Educational Panel for Teaching of Engine Control* (Ďurovský, F.)
3. Kliman, M.: *Fuzzy Modelling and Control of Electrical Drive* (Fedor, P.)
4. Bugár, M.: *Fuzzy Model of a Continuous Line* (Perduková, D.)
5. Nyiri, B.: *Fuzzy Model of Asynchronous Motor* (Perduková, D.)
6. Barjak, V.: *Educational Panel with the LOGO Module* (Ďurovský, F.)

Note: All theses are In Slovak.

7.3. Theses to the PhD. Exam.

1. Seman, S.: *Models of Cold Tandem Mills*
2. Slanina, V.: *Sensorless Control of Asynchronous Motor*

8 OTHER ACTIVITIES

8.1. Symposia, Workshops, Conferences

- *High-Tech Workshop, Herľany 2002*. 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). The 2002 workshop, already 14th in order, is organised annually and its programme includes specialised, sport and social parts with extremely interesting presentations and discussions, and amusing sporting and other disciplines. More information about this action are to be found in www.tuke.sk/hth.

8.2. Student Competitions and Rewards

- *International Competition in Student Scientific Activity. Ostrava, June 2002*.
Balogh, R.: *Possibilities of PC Support at Teaching in Power Electronics and Semiconductor Converters (the 3rd place)*
Kerestúri M.: *Control of a Cran Drive (the 3rd place)*
Šimko, O.: *Simulation and Visualisation Model of Robot Movement Control (the 1st place)*
- "Werner von Siemens Excellence Award for the Master Thesis". Mr. Ing. Ondrej Šimko awarded by the companies Siemens, s.r.o., Siemens Business Services s.r.o., SWH s.r.o. and Slovak Rector's Conference to the 1st position in category "Final Theses" to his work (final thesis): Simulation and Visualisation Model of Robot Movement Control (www.siemens.sk).

8.3. Project for Industry

1. KOSTELNÝ, M.; FEDOR, J.; FERKOVÁ, Ž. Commutation Relations in Universal Motor. BSH Drives and Pumps, s.r.o., Michalovce.
2. FETYKO J.; ĎUROVSKÝ, F.; HUTNÍK, E. Design and Realisation of the Coiler No. 2 in US Steel Košice, The Hot Tandem Mill Plant.
3. FETYKO J.; ĎUROVSKÝ, F.; HUTNÍK, E. Design and Realization of Drives for Turboexhauster for Sintering Strips. US Steel Košice, The Blast Furnace Plant
4. FETYKO J.; ĎUROVSKÝ, F.; HUTNÍK, E. Design and Realisation of Drives and Control of Cutting Line. US Steel Košice, The Hot Tandem Mill Plant.
5. FETYKO J.; ĎUROVSKÝ, F.; SEMAN, S.; SLANINA V. Simulation of Dynamic States in 4- and 4-Rolling Mill Stand in US Steel Košice, The Cold Tandem Mill Plant.
6. DUDRÍK, J.; ONDERA, J.; VIŠNYI, P. Development of Source for Accumulator Charging with Sinus Input Current. Telegrafia, s.r.o., Košice.

9 PUBLICATIONS

9.1. Books

1. TIMKO, J.; ŽILKOVÁ, J.; BALARA, D.: *Application of Artificial Neural Networks in Electrical Drives*. Košice : Calypso, s.r.o., 2002, 239 p. ISBN 80-85723-27 (In Slovak)

9.2 Journals

7. DUDRÍK, J.; ONDERA, J.; VIŠNYI, P.; RINDOŠ, P.; LENHARDT, P. Low-frequency Switched Amplifier of High Power. In *Elektro*, 2002, vol. 12, no. 10, pp. 2-5.
8. DUDRÍK, J.: Design of the Smoothing Choke for Switched Sources with Variable Voltage. In *Journal "Časopis EE"*, 2002, vol. 8, no. 5, pp. 6-7. (In Slovak)
9. FEDOR, P.; PERDUKOVÁ, D. Fuzzy Controller without Necessity of Deriving. In *Elektrotechnika v praxi*, Ostrava, 2002, vol. 12, July/August, pp. 54-56. ISSN 0862-9730. (In Slovak)
10. FEDOR, P.; PERDUKOVÁ, D.; TIMKO, J. The Multi-Motor Drive Model for Teaching in the Motion and Process Control Engineering. In *Acta Electrotechnica et Informatica*, 2002, vol. 2, no. 2, pp. 19-25. ISSN 1335-8243. (In Slovak)
11. FEDOR, P.; PERDUKOVÁ, D. Fuzzy Access in Ergonomic System Modelling. In *AT&P Journal*, 2002, vol. 4, no. 11, pp. 70-71. ISSN 1335-2237. (In Slovak)
12. FERKOVÁ, Ž.; ZBORAY, L.; ĎUROVSKÝ, F. Model and Control of Switched Reluctance Motor. In *Acta Electrotechnica et Informatica*, 2002, vol. 2, no. 2, pp. 13-19.
13. FEDOR, S.; KLUCH, K.; FERKOVÁ, Ž. Unconventional Supply Source of Equipment for Icebound Sensing. In *Elektrotechnický magazín* (Czech Republic), 2002, vol. 12/2002, no. 4. (In Slovak)
14. ŽILKOVÁ, J.; TIMKO, J. On-line Estimation of Quantities Using Artificial Neural Networks. In *Acta technica ČSAV*, Praha, 2002, vol. 47, no. 3, pp. 305-315.
15. ZÁSKALICKÝ, P. Calculation of the Torque Ripple of the Two-phase Synchronous Permanent Magnets Motor. In *Acta Electrotechnica et Informatica*, 2002, vol. 2, no. 2, pp. 56-60, ISSN 1335-8243.
16. KAŇUCH, J.; TVRDOŇ, M. Measurement of the Load Angle of Synchronous Machine. In *Journal "Časopis EE"*, 2002, vol. 8, no.6, pp. 18, 27. (In Slovak)
17. HIČÁR, M.; ZBORAY, L.; BALARA, L. The Robust Control of the Cranes's Crab. In *Acta Electrotechnica et Informatica*, 2002, vol. 2, no. 1, pp. 5-9.
18. KERESTÚRI, M.; ZBORAY, L.; HIČÁR, M. Robust Control with Enlarged Interval of Uncertain Parameters. In *ADVANCES in Electrical and Electronic Engineering*, Žilina, 2002, vol. 1, pp. 9-12. ISSN 1336-1376
19. ZÁSKALICKÝ, P. Dynamic Model of Two-phase Permanent Magnet Synchronous Motor. In *Scientific Letters of Silesian University of Technology, Elektryka*. PL ISSN 0072-4688 (accepted for printing).
20. ČVERČKO, J.; MATINA, R.; BOROŠ, H.; ĎUROVSKÝ, F. Optimization of the Rolling Processes at the 4 Stand and 4 Stand Cold Rolling Tandem Mill. *Acta Metallurgica Slovaca*. In *Int. Conference "THER TECH FORM '02" (Theoretical and Technological Problems of Steel and Nonferrous Metal Forming)*, Košice, 2002, pp. 231-241. ISSN 1335-1532, (In Slovak)
21. BORBEL, M., ŽILKOVÁ, J., TIMKO, J.: Neural Estimation for the Induction Motor

Drive. *In Acta Electrotechnica et Informatica*, no. 4, vol. 2, 2002, pp. 27-30, ISSN 1335-8243 (In Slovak)

9.3 Textbooks

1. HARČARUFKOVÁ, K.; HARČARUFKA, R.; PERDUKOVÁ, D. Basic Work in PowerPoint. *Textbook for distance education*. Bratislava : STU, 2002, 167 p. ISBN 80-227-1653-7. (In Slovak)
2. KOVÁČ, D.; KOVÁČOVÁ, I. Theoretical Electrotechnics I. Košice : Elfa, 2002, 112 p. ISBN 80-89066-27-5. (In Slovak)
3. ŠIMKO, V.; KOVÁČOVÁ, I. Electrotechnics – Selected Chapters. Košice : Elfa, 2002, 237 p. (In Slovak)
4. ĎUROVSKÝ, F.; FERKOVÁ, Ž.; SLANINA, V.; HUTNÍK, E. Simoreg 6 RA 24. Košice: Dept. of El. Drives and Mechatronics, Technical University, 2002, 84 p.

9.4 Conferences

1. PERDUKOVÁ, D.; FEDOR, P.; FEDOR, S. Some Properties of Fuzzy Controllers in Electrical Drives. In *Proc. Symposium SYMEP 2002*, Liberec, June 2002, pp. 74-80, ISBN 80-7083-612-1. (In Slovak)
2. FEDOR, S.; FEDOR, P.; PERDUKOVÁ, D. Controller with Microprocessor for Washing Machine Drive. In *Proc. Symposium SYMEP 2002*, June 2002, pp. 237-242. ISBN 80-7083-612-1. (In Slovak)
3. HARČARUFKA, R.; HARČARUFKOVÁ, K. Startingpoints for Design of 3-stages Study Programme in Field of Mechatronics. In *Proc. 5th Int. Symposium Mechatronika 2002*, Gabčíkovo May 2002, pp. 25-30. ISBN 80-227-1714-2. (In Slovak)
4. HARČARUFKA, R.; HARČARUFKOVÁ, K.; ORBÁNOVÁ, I. Project I2DV/DVUI and Achieved Experiences. In *Proc. Int. Conference on Virtual University*, Bratislava, 2002, pp. 55-59. ISBN 80-227-1811-4. (In Slovak)
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