

DEPARTMENT OF PRODUCTION ENGINEERING

Head of Department:

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I. STAFF

Professors

Ladislav Javorčík, PhD., Prof.

Professor in: Production Machines

Research topics: Automation of Production Technique, New Technologies in Production
Technique, Conceptual Solutions of Production Machines Design

Associate Professors

Lubomír Šooš, PhD., Assoc. Prof.

Associate Professor in: Production Machines

Research topics: Production Machines Nodal Points Development, Ecological Machines Design,
Creation of the Software for Production Machines Design

Milan Lenárt, PhD., Assoc. Prof.

Associate Professor in: Production Technology

Research topics: Cutting Tools Design and Diagnostics, Fixtures Design

Senior lecturers: 3

Research workers: 7

PhD students: 6 (internal form), 7 (external form)

Technical staff: 2

Mechanics: 2

II. EQUIPMENT

II.1 Teaching and Research Laboratories

- Applied software laboratory
- CNC-laboratory (Grundig Numeric)
- Fluid Systems laboratory
- E-learning laboratory
- Measuring laboratory for construction units

II.2 Laboratory Equipment

- CNC Systems (milling, turning)- Grundig Numeric, Rotary and linear sensors, Drive unit MEZOMATIC, Stepping Motors, software for preparing NC software for PC's, 14 PC, 1 WS, LAN
- software: I-DEAS, Pro-Engineer, CATIA, AutoCAD 2004, Amipro, WINCMD, Matlab, MS Word, SolidWorks 2005 (for educational use only), CosmosWorks 2005 (for educational use only), SolidCAM 2005 (for educational use only), COSMOS/M, HEAD STOCK, Databases – STEEL, TECHNOL
- datacollector Microlog CMVA 10 – SKF Slovakia
- grinding machine BRH 32CNC – VOJUS, Inc., Považská Bystrica
- 13 computer work stations, data-projector with reflex silver screen, video-software, cameras, microphones and loudspeakers for video conferences
- new ribbon saw (company: Pedrazzoli)
- high-frequency drilling machine (company: FLOT)
- apparatus for measuring of technical parameters of nodal points of production technique (frequency changer, oven, moisture-meter, thermometer, gear-box)
- apparatus for Fluid Systems Laboratory
- electric and pneumatic components from SME
- CNC systems of machining machines (milling, turning) from company Grundig Numeric, rotary and linear sensors of position, servo-drive and MEZOMATIC, step motor, software for preparing NC programs for PC, 14 PC, 1 WS, LAN, servo-drives from company SEW-EURODRIVE
- Software: SolidWorks, CATIA, Auto-CAD 2002 LT, Amipro, WINCMD, Matlab, MS Word, COSMOS/M, special SW – HEAD STOCK, Databases – OCEL, TECHNOL

II.3 New Equipments at department

- E-learning laboratory
Laboratory is equipped by modern computer technology, cameras technique permits realization of videoconferences. In the year 2006 we built Student design Office. The Office is assigned especially for design activities of students of 2nd and 3rd degree. The reconstruction includes building reforms, new Windows, new electricity, air-condition, new sun-blinds. Original room was separated for two parts by a wall. Designing part will be equipped by the most modern computer technique. The other part – printing laboratory will be equipped by 3D scanner, 3D printer, 3D camera.

III. TEACHING

III.1 Graduate Study

Name of subject	semester	hours per week		reader's name
		lectures	seminars	
Production Machines I	7	2	2	L. Javorčík
Selected articles from mechanics	7	2	1	L. Starek
Controlling of Production Technique	7	2	2	Ľ. Kolláth
Tools and Fixtures	7	2	2	M. Lenárt

Fluid Systems	7	2 – 2	Ľ. Kolláth
Design of Elements	7	0 – 2	I. Kopecký
Foreign language	7	0 – 2	J. Galata
Mathematical statistics	8	1 – 1	I. Janiga
Low-waste technologies	8	2 – 2	Ľ. Šooš
Production Machines II	8	2 – 2	J. Slavkovský
Semestral Project I	8	0 – 4	
Computer – Aided Manufactur	8	1 – 2	Ľ. Šooš
Forming tools	8	2 – 2	Š. Kovalík
Special Technologies	9	2 – 1	P. Kostka
Modelling and simulation	9	2 – 2	Ľ. Kolláth
Automation equipment	9	2 – 1	M. Lenárt
Machine for assessing of waste	9	2 – 2	Ľ. Šooš
Semestral Project II	9	0 – 4	
Produce Development PDM/DFx	9	1 – 2	L. Javorčík
Mechatronic systems	10	2 – 1	Ľ. Kolláth
Modular designing	10	2 – 1	Ľ. Šooš
Thesis Project	10	0 – 5	
Security and Health Protection at Work	9	1 – 1	J. Beniák
Information and commutations' technologies	10	2 – 1	M. Horvát
Technical Diagnostics	10	2 – 1	M. Lenárt
Experimental methods	10	2 – 1	M. Lenárt
CA methods	10	2 – 2	Ľ. Šooš
Environmental management	10	2 – 1	Ľ. Šooš
Methodics designing	7	2 – 0	I. Kopecký
Ecology in engineering	9	2 – 0	P. Gros

III.2 Undergraduate Study

Name of subject	semester	hours per week		reader's name
		lectures	seminars	
Production Machines and systems	6	2 – 2		L. Javorčík
Tools and Fixtures I	5	2 – 2		M. Lenárt
Controlling of Production Technique	6	3 – 2		Ľ. Kolláth
Environmental Technique	6	2 – 2		Ľ. Šooš

IV. RESEARCH TOPICS

- Automation of Production Technique
- Conceptual Solutions of Production Machines Design
- Creation of Software for Production Machines Design
- Cutting Tools Design and Diagnostics
- Ecological Machines Design
- Fixtures Design
- New Technologies in Production Technique
- Production Machines Nodal Points Development

V. RESEARCH PROJECTS

RTD projects:

- APVT 99-02-2604 Machinery for extreme fast dividing materials. Contractual period 10/2005 – 12/2006, contact person Ľ. Kolláth
- APVT 20-021104 Modular structural disintegration machinery for the disintegration of solid organic waste. Contractual period 01/2005 – 12/2007, contact person Ľ. Šooš
- VEGA 1/3187/06 Production of shape accurating blocks for europallet by pressing. Contractual period 2006 – 2008, principal investigator Ľ. Šooš
- VEGA No. 1/3181/06 Universal tool carrier for extreme fast dividing of materials. Contractual period 2006 – 2008, principal investigator Ľ. Kolláth

Cooperative Contracts:

- ZoD 4/06 Seminar Briquetting and pelleting 2006. Project head Ľ. Šooš
- ZoD 30/06 Institute of materials and mechanics of machines SAV, Bratislava – Engineering documentation of technological equipment for pressure infiltration of pore graphite components. Principal investigator Ľ. Šooš
- ZoD 44/06 MicroStep – HDO, Ltd. – Production tester of tires uniformity and dynamic calibration machine for tires. Principal investigator Ľ. Šooš
- ZoD 58/05 AVS Plus, Ltd. – Project of pelleting line. Principal investigator Ľ. Šooš
- ZoD 60/05 Technique of Environment Protection – TOP 2006, international conference Častá-Papiernička. Principal investigator: Ľ. Šooš
- ZoD č. 68/05 Institute of materials and mechanics of machines SAV – Engineering documentation of technological equipment for pressure infiltration. Principal investigator: Ľ. Šooš

VI. COOPERATION

VI.1 Cooperation in Slovakia

- AQUACLEAN, Ltd., Bratislava
- BIG Group Bratislava
- Ing. Častulík, Ltd., Bratislava
- MATADOR, Inc., Púchov
- MicroStep, Ltd., Bratislava

- SKF Slovensko
- TRENS, Inc., Trenčín
- VUJE, Inc., Trnava
- VURAL, Inc., Žilina
- INA Skalica, Ltd., Skalica
- AVS Plus, Slovakia, Ltd.
- KOVOD

VI.2 International Cooperation

- SETRA, Ltd. Brno, Czech Republic
- TU Magdeburg, Germany
- TU Vienna, Austria
- VŠB-TU Ostrava, Czech Republic

VI.5. Membership in Domestic Organisations and Societies

- L. Javorčík – Member of Editorial Board – Transaction of TU Košice
- L. Javorčík – Member of Scientific Board of Faculty of Mechanical Engineering STU in Bratislava
- L. Javorčík – Chairman of Departmental Committee of PhD.- study – Production Machines and Equipment
- L. Javorčík – Member of Committee for Final Examinations – Production Engineering
- E. Šooš - Member of Council of Universities SR
- E. Šooš - Member of work group of Accreditation Committee Ministry of Education SR
- E. Šooš – External Expert – 039 of Slovak Society for Control and Quality Systems
- E. Šooš - Chairman of ZKpSP Directorate
- E. Šooš - Editorial Board of Magazine „Wastes”
- E. Šooš - Member of Committee of Ministry of Environment SR for delivering of Accreditations
- E. Šooš - Member of Committee of Recycling Fund – multilayer materials

VI.6 Membership in International Organisations and Societies

- L. Javorčík - International Federation of Automatic Control (IFAC) – TC Integration in Manufacturing
- L. Javorčík - TC on Control Education (EDCOM)
- L. Javorčík - A Member of Expert Committee - Centre of Excellence (EU)
- L. Javorčík - Ministry of Education – Expert’s Committee for bankruptcy estate
- E. Šooš - DAAAM International Symposium Staff
- E. Šooš - Member of organizing committee Combustion 2004, VŠB-TU Ostrava, Czech Republic
- E. Šooš - Member of organizing committee ROBTEP, FME TU Košice
- E. Kolláth - Member of scientific committee for international scientific conference Scientific Conference of Young Scientists, Cluj-Napoca, Rumania
- E. Kolláth – member of the jury for Recycling fund projects
- E. Kolláth - member of Convocation professional section of university at ASPEK

VI.7 Foreign Visitors at the Department

- Prof. Csaba Gyenge – TU Cluj-Napoca, Romania

VI.8 Visits of Staff Members and Postgraduate Students to Foreign Institutions

- E. Kolláth – Prague, Czech Republic (1 day)
- E. Šooš, E. Kolláth – Luhačovice, Czech Republic (2 days)
- J. Beniak, P. Križan, M. Letko - Brno, Czech Republic (2 days)

VII. THESES

VII.3 Graduate Theses (Diploma Works)

(Supervisor's name in the brackets)

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|--|-----------------|
| [1] Belan, O.: <i>CNC machines for ultra quickly separation of materials</i> | (E. Kolláth) |
| [2] Ivanovič, M.: <i>Press for old cars compacting</i> | (E. Šooš) |
| [3] Janík, T.: <i>Parameters of two-rotors headstock „DUPLO“</i> | (E. Šooš) |
| [4] Kovačič, M.: <i>Optimisation of cutting tool of shredding machine</i> | (M. Lenárt) |
| [5] Labuda, T.: <i>Design of equipment to increase of productivity eggs of rhagoletis and their automated collection</i> | (I. Morávek) |
| [6] Magál, M.: <i>Universal bending machine for stripes, pipes and profiles</i> | (J. Slavkovský) |
| [7] Matúš, M.: <i>Progressive construction of compacting machine</i> | (E. Šooš) |
| [8] Petriková, B.: <i>Single-rotor shredder in system of modular building of shredding machines</i> | (E. Šooš) |
| [9] Ploskuňáková, L.: <i>Energetic valuation of sludge</i> | (E. Šooš) |
| [10] Sobolič, V.: <i>High-frequency headstock with integrated power drive</i> | (M. Lenárt) |
| [11] Zeman, E.: <i>E-catalogue of typing support solutions of machine tool spindle</i> | (L. Javorčík) |

VIII. OTHER ACTIVITIES

VIII.1 Organisation of Department Actions

- Seminar Briquetting and pelleting 2006, February 2006
- International Conference Technique of Environment Protection – TOP 2006, June 2006

VIII.2 Membership in Committees, Organisations and Editorial Boards

- L. Javorčík - Chairman of Committee for Final Examinations in Specialization Machines and Equipment for Production Technique, Faculty of Mechanical Engineering, Bratislava
- L. Javorčík - Member of Committee for Final Examinations in Specialization Mechanical Technology MTF Trnava
- L. Javorčík - Member of SOK PhD-study in Specialization Production Engineering
- E. Šooš - Member of Committee for Final Examinations in Specialization Machines and Equipment for Production Technique, Faculty of Mechanical Engineering, TU Košice

- E. Šooš - Member of Committee for dissertation exams, TU Košice
- E. Šooš - Chairman of Committee for Final Examinations in Specialization Machines and Equipment for Production Technique, Faculty of Mechanical Engineering, Bratislava
- E. Šooš - Member of Committee for Final Examinations in Specialization Mechanical Engineering Technology
- E. Šooš - Adviser in Science Specialization Production Technique
- E. Šooš - Member of Commission for Public Acquisition at Ministry of Work, Social Care and Family SR
- E. Šooš - Head of Organizing Committee of International Conference TOP 2006
- E. Šooš - Director of Office for Cooperation with Industry
- E. Šooš - Vice-president of Senatus Academicus STU Bratislava
- E. Šooš - Environmental Auditor of Ministry of Environment SR
- M. Lenárt - Member of Committee for Final Examinations in Specialization Machines and Equipment for Production Technique, Faculty of Mechanical Engineering, STU Bratislava
- M. Lenárt - Editor Officer of Faculty of Mechanical Engineering STU, Bratislava
- M. Lenárt - Member of Committee for Defence PhD-works in Specialization Metrology, Faculty of Mechanical Engineering STU, Bratislava
- M. Lenárt - Adviser in Science Specialization Production Technique
- E. Kolláth - Member of Organizing Committee of International Conference TOP 2006
- E. Kolláth - Member of Committee for Final Examinations in Specialization Machines and Equipment for Production Technique, Faculty of Mechanical Engineering, STU Bratislava
- E. Kolláth - Member of Committee for Final Examinations in Specialization Production Engineering and Management, Faculty of Mechanical Engineering, STU Bratislava
- E. Kolláth - Organizing Guarantee of Seminar Briquetting and Pelleting
- E. Kolláth - Organizing Guarantee of Workshop "Parallel Kinematic Structures"
- M. Horvát - Member of Organizing Committee of International Conference TOP 2006
- M. Horvát - Member of Committee for Organisation of seminar "Briquetting and Pelletizing"
- M. Horvát - Administrator of Computer Network and Webmaster
- L. Havlík - Chairman of Liquidation Committee of Faculty of Mechanical Engineering

IX. PUBLICATIONS

- [1] Árvay, J.: *Analyse and resources of optimization of force proportion on pressing process at pressing tool - pressing screw*. In: Acta Mechanica Slovaca, ISSN 1335-2393, Vol. 10, No. 2-A, pp. 41-46 (in Slovak)
- [2] Beniák, J.: *Experimental measuring device for disintegration of solid materials*. In: Proceedings of the international conference Odpady 2006, Spišská Nová Ves, November 2006, ISBN 80-968214-6-6, pp. 236-341 (in Slovak)
- [3] Beniák, J.: *Force measurement in shredding process*. In: TOP 2006, Proceedings of the international conference, Častá Papiernička, June 2006, ISBN 80-227-2436-X, pp. 41-47 (in Slovak)
- [4] Chren, O.: *Analyse of behaviour of parallel kinematics*. Written theses for a PhD. exam, Bratislava, STU, 2006, 51 pp. (in Slovak)

- [5] Harman, B., Chren, O., Kolláth, L.: *Determination of working space of conceptual tricept by means of Monte Carlo method*. In: Proceedings of the international conference Mechanical Engineering 2006, November 2006, ISBN 80-227-2513-7, pp. 745-750 (in Slovak)
- [6] Harman, B., Chren, O., Kolláth, L.: *The movement equations of tricept*. In: Proceedings of the international conference CO-MAT-TECH 2006, Trnava, October 2006, ISBN 80-227-2472-6, p. 311-316 (in Slovak)
- [7] Harman, B., Šooš, L., Cibula, J., Krížik, P.: *Determination of basic parameters of pellet briquette and their optimization*. In: Proceedings of the international conference Mechanical Engineering 2006, November 2006, ISBN 80-227-2513-7, pp. 737-744 (in Slovak)
- [8] Javorčík, L., Onderová, I.: *Knowledge triangle - higher education, research and innovation - a role in the field of production engineering*. In: Proceedings of the international conference Mechanical Engineering 2006, November 2006, ISBN 80-227-2513-7, pp. 751-755 (in Slovak)
- [9] Kolláth, L., Gros, P., Onderová, I.: *Design of CNC laser cutting machine using the F.E.M.* In: Acta Mechanica Slovaca, ISSN 1335-2393, Vol. 10, No. 2-A, pp. 231-238 (in Slovak)
- [10] Kolláth, L., Gros, P., Onderová, I.: *High speed CNC laser cutting machine with linear motors*. In: Manufacturing Engineering, ISSN 1335-7972, Vol. 5, No. 2 (2006), pp. 26-29 (in Slovak)
- [11] Kolláth, L., Javorčík, L.: *An intelligent monitoring system for a CNC machine tool*. In: Manufacturing Engineering, ISSN 1335-7972, Vol. 5, No. 4 (2006), pp. 9-12
- [12] Kolláth, L., Šooš, L.: *International conference on Engineering of Environment Protection - TOP 2006*. In: Spektrum, Bratislava, STU, Vol. 13, No. 1 (2006), pp. 13-14 (in Slovak)
- [13] Krajný, Z.: *Using of the sun beam for machining materials*. In: TOP 2006, Proceedings of the international conference, Častá Papiernička, June 2006, ISBN 80-227-2436-X, pp. 239-248 (in Slovak)
- [14] Križan, P., Komžík, M.: *Possibilities of energetical valuation vegetable waste from plantations, vineyards and gardens*. In: Sady a vinice, Nitra, ISSN 1336-7684, Vol. 1, No. 4 (2006), pp. 12-13 (in Slovak)
- [15] Križan, P.: *Compacting process and his experimental research*. In: Proceedings of the international conference Odpady 2006, Spišská Nová Ves, November 2006, ISBN 80-968214-6-6, pp. 229-235 (in Slovak)
- [16] Križan, P.: *Experimental research of factors which have influence on extrusion quality*. In: TOP 2006, Proceedings of the international conference, Častá Papiernička, June 2006, ISBN 80-227-2436-X, pp. 249-254 (in Slovak)
- [17] Križan, P.: *Material humidity - factor which have a great impact on the extrusion quality at compacting*. In: Manufacturing Engineering, ISSN 1335-7972, Vol. 5, No. 4 (2006), pp. 32-35 (in Slovak)
- [18] Križan, Peter: *Parameters which have an impact on pressing tension in pressing chamber*. In: Proceedings of the international conference Mechanical Engineering 2006, November 2006, ISBN 80-227-2513-7, pp. 789-794 (in Slovak)
- [19] Križan, Peter: *Theoretical and experimental research of compacting process*. In: Proceedings of the conference Briketovanie a peletovanie, Bratislava, 2006, ISBN 80-227-2371-1, pp. 109-113 (in Slovak)

- [20] Krížik, P.: *New developed design of compact machine*. In: TOP 2006, Proceedings of the international conference, Častá Papiernička, June 2006, ISBN 80-227-2436-X, pp. 255-260 (in Slovak)
- [21] Krížik, P.: *Proposal of new design of compact machine*. In: Proceedings of the conference Briketovanie a peletovanie, Bratislava, 2006, ISBN 80-227-2371-1, pp. 137-140 (in Slovak)
- [22] Kureková, E., Árvay, J.: *Design of experiments for devices used in waste processing*. In: TOP 2006, Proceedings of the international conference, Častá Papiernička, June 2006, ISBN 80-227-2436-X, pp. 273-280 (in Slovak)
- [23] Letko, M.: *Advantages and disadvantages of modular design of disintegration machines used for processing of raw material before pelletizing and briquetting process*. In: Proceedings of the conference Briketovanie a peletovanie, Bratislava, 2006, ISBN 80-227-2371-1, pp. 141-144 (in Slovak)
- [24] Letko, M.: *Modular designs of double-shaft cylindrical disintegration machines*. In: TOP 2006, Proceedings of the international conference, Častá Papiernička, June 2006, ISBN 80-227-2436-X, pp. 307-312 (in Slovak)
- [25] Onderová, I.: *CNC cutting machine with the linear motors*. In: Proceedings of the international conference Mechanical Engineering 2006, November 2006, ISBN 80-227-2513-7, pp. 812-818 (in Slovak)
- [26] Onderová, I.: *Measurement of accuracy and repeatability of positioning of high speed CNC laser cutting machine*. In: Proceedings of the international conference CO-MAT-TECH 2006, Trnava, October 2006, ISBN 80-227-2472-6, pp. 1-7 (in Slovak)
- [27] Palenčár, R., Gros, P., Halaj, M.: *Evaluation of the positional deviation of numerically controlled axes*. In: Journal of Mechanical engineering, Bratislava, ISSN 0039-2472, Vol. 57, No. 1 (2006), pp. 1-12
- [28] Šooš, L., Gros, P.: *Project of crankshaft briquetting press*. In: Acta Mechanica Slovaca, ISSN 1335-2393, Vol. 10, No. 2-A, pp. 521-530 (in Slovak)
- [29] Šooš, L., Koleják, M.: *Waste as a source of energy*. In: TOP 2006, Proceedings of the international conference, Častá Papiernička, June 2006, ISBN 80-227-2436-X, pp. 445-452 (in Slovak)
- [30] Šooš, L., Koleják, M.: *Waste as a source of energy*. In: Odpady, ISSN 1335-7808. - Vol. 6, No. 10 (2006), pp. 3-8 (in Slovak)
- [31] Šooš, L., Kolláth, L., Krížik, P.: *Energetical evaluation of sludge*. In: Proceedings of the conference Odpady - Luhačovice 2006, Luhačovice, September 2006, CEMC, 2006, pp. 225-233 (in Slovak)
- [32] Šooš, L., Kolláth, L., Letko, M.: *Realised projects of briquetting and pelleting technology lines*. In: Proceedings of the conference Briketovanie a peletovanie, Bratislava, 2006, ISBN 80-227-2371-1, pp. 81-89 (in Slovak)
- [33] Šooš, L., Križan, P., Letko, M.: *Development of new constructions of compacting machines for rare extrusion producing*. In: Proceedings of the conference ENEF 2006, Sliač, November 2006, on CD (in Slovak)
- [34] Šooš, L.: *Collecting and processing of end of life vehicles (ELV)*. In: Odpadové forum, Prague: CEMC, No. 10 (2006), pp. 14-16 (in Slovak)

- [35] Šooš, L.: *Cultured solid biofuel and its competitive*. In: Proceedings of the international conference Vykurovanie 2006, Tatranské Matliare, March 2006, ISBN 80-89216-06-4, pp. 187-191 (in Slovak)
- [36] Šooš, L.: *Cultured solid biofuel*. In: Topenářství, instalace, Prague, ISSN 1211-0906. - No. 5 (2006), pp. 38 (in Slovak)
- [37] Šooš, L.: *Duplo drive, reality or vision?* In: Acta Mechanica Slovaca, ISSN 1335-2393, Vol. 10, No. 2-A, 2006, pp. 515-518 (in Slovak)
- [38] Šooš, L.: *Interface between faculty and practice in solving projects in the waste management department*. In: Proceedings of the conference Odpadové fórum 2006, Milovy, April 2006, ISBN 80-02-01792-7, pp. 3229-3234 (in Slovak)
- [39] Šooš, L.: *Nontraditional sources of energy*. In: Proceedings of the conference Tepelná energia - CZT - energia pre všetkých, Trnava, October 2006, on CD (in Slovak)
- [40] Šooš, L.: *Pellets as a renewable energy source and the problems of domestic market*. In: Životné prostredie, Bratislava, SAP-Slovak Academic Press, ISSN 0044-4863, Vol. 40, No. 3 (2006), pp. 143-147
- [41] Šooš, L.: *Profits and difficulties of production of generous biofuels*. In: Alternativní energie, ISSN 1212-1673, Vol. 9, No. 5 (2006), pp. 35-36 (in Slovak)
- [42] Šooš, L.: *The first line in Slovakia which enable all at once production of briquettes and pellets*. In: TOP 2006, Proceedings of the international conference, Častá Papiernička, June 2006, ISBN 80-227-2436-X, pp. 437-444 (in Slovak)
- [43] Šooš, L.: *The first line, which enable all at once production of briquettes and pellets*. In: Odpady, ISSN 1335-7808, Vol.6, No.9 (2006), pp. 3-6 (in Slovak)
- [44] Šooš, L.: *Waste treatment for energy utilization*. In: Odpadové forum, Prague, Czech Republic: CEMC, No. 11 (2006), pp. 26-27 (in Slovak)