

**DEPARTMENT OF ELECTROTECHNOLOGY**

<http://aladin.elf.stuba.sk/Katedry/KETG/>

**Head of Department**

**Doc. Ing. Jaroslav Lelák, PhD.**

e-mail: jaroslav.lelak@stuba.sk

Tel/Fax: +421-2-654 25 822

**I. STAFF**

Associate Professors	Doc. Ing. Anna Grusková, PhD., Doc. Ing. Jaroslav Lelák, PhD., Doc. Ing. Vladimír Šály, PhD., Doc. Ing. Miroslav Kopča, PhD.
Assistant Professors	Ing. Juraj Packa, PhD., Ing. Peter Poljovka, PhD., Ing. Michal Váry, PhD.
Senior Scientists	Ing. Michal Ružinský, PhD., Ing. Vladimír Ďurman, PhD.
Technical Staff	Anna Ferenčíková (secretary), Marián Kamendy
PhD. Students	Ing. Milan Perný, Ing. Ján Budaj, Ing. Martin Kusko

**II. EQUIPMENT**

**II.1 Teaching and Research Laboratories**

- Photovoltaic Laboratory
- High Voltage and Ageing Tests Laboratory
- Laboratory of Cables and Wires
- Laboratory of Health Protection at Work
- Laboratory of Dielectric Properties of Materials
- Laboratory of Electrical Components
- Laboratory of Liquid Dielectrics
- Laboratory of Magnetic Materials

**II.2 Special Measuring Instruments and Computers**

- Test Chambers for Combined Ageing Tests of Insulating Systems
- Solar Simulator for Photovoltaics
- Climatic Test Chamber Feutron
- Systems for Measuring of Complex Impedance
- Vibration Magnetometer PVM-1
- Solar Cells Electric Characterization Equipment

**III. TEACHING**

**III.1 Undergraduate Study (Bc.)**

Subject, semester, hours per week for lectures and for seminars or practical exercises, name of the lecturer:

Safety and Protection of Health at Work I	(1st sem., 1-2h)	M. Kopča, V. Šály, J. Packa
Safety and Protection of Health at Work	(1st sem., 1-2h)	M. Kopča

Materials for Electrical Engineering	(3rd sem., 2-3h)	V. Šály
Materials and Technology for Electrical Engineering	(3rd sem., 2-3h)	J. Lelák
Safety and Protection of Health at Work II	(4th sem., 1-4h)	M. Kopča, V. Šály
Technological Processes	(6th sem., 2-3h)	V. Šály, A. Grusková

### III.2 Graduate Study (Ing.)

Technology of Electronic Devices	(1st sem., 2-2h)	M. Kopča
Renewable Energy Sources	(1st sem., 2-1h)	M. Ružinský
Technology of Ceramic Composites	(2nd sem., 2-2h)	A. Grusková
Materials Physics 2	(2nd sem., 2-3h)	V. Ďurman
Photovoltaic Cells and Systems	(3rd sem., 2-2h)	V. Šály
Quality Management	(3rd sem., 2-1h)	P. Poljovka
Metallic and Optical Cables	(3rd sem., 2-2h)	J. Lelák

### III.3 Undergraduate Study (Bc. Distance Education Method)

Safety and Protection of Health at Work I	(1st sem.)	M. Kopča
Safety and Protection of Health at Work II	(4th sem.)	M. Kopča
Materials for Electrical Engineering	(3rd sem.)	J. Lelák

## IV. RESEARCH PROJECTS

- Research on Relation between Polarisation and Degradation Processes in Electro-Insulating Systems, VEGA 1/4086/07, J. Lelák
- Photovoltaic Structures for Solar Cells, Modules and Systems, VEGA 1/4080/07, M. Ružinský
- Research and Preparation of Perspective Magnetic, Nanomagnetic and Hybrid Composite Materials for New Applications in Electrical Engineering and Automobile Industry, VEGA 1/0575/09, J. Sláma, A. Grusková, V. Ďurman
- Structural and Magnetic Changes of Disordered and Nanocrystalline Alloys, VEGA 1/0606/09, J. Sitek, A. Grusková
- Investigation of Ageing the Electroinsulating Materials for Objective Determination of Durability of Selected Electrical Systems, APVV-99-011905 (VUKI), J. Lelák

### International Scientific Projects:

- Preparation and Characterization of Materials Based on Iron Oxides by Magnetic Methods, Czech /Slovak cooperation, ZS-4/2001-2010, J. Šubrt, A. Grusková
- Magnetic and Microstructural Studies of New Nanocomposited and Substituted Ferrites, Synthesized by Mechanical Alloying and Other Advanced Methods, CONACYT project 89783 (UABC, Mexicali), Mexico Slovak Cooperation, A. González, A. Grusková

## V. COOPERATION

### V.1 Cooperation in Slovakia

- VUKI jsc, Bratislava

- EZ-Elektromont jsc
- VÚJE jsc, Trnava
- MURAT Ltd., Pezinok
- BEZ jsc, Bratislava
- HAKL Ltd., Bratislava
- DELTA ENERGY SYSTEMS Ltd Nová Dubnica
- SE jsc OZ EBO, Jaslovské Bohunice
- SYLEX Ltd., Bratislava
- Elkond HHK jsc, Trstená
- Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava
- Institute of Physics, Slovak Academy of Sciences, Bratislava
- VUSAPL, Nitra
- THERMO-SOLAR Ltd., Žiar n. Hronom
- ELBA jsc, Kremnica
- PPC Čab jsc, Nové Sady
- TAU-CHEM Ltd., Bratislava
- All Deco Ltd., Jaslovské Bohunice
- Institute of Materials Research, Slovak Academy of Sciences, Košice
- Elektroservis jsc, Bratislava
- SONY Slovakia Ltd., Nitra Plant
- UPJŠ Košice
- ZSE jsc, Bratislava
- UMMS-SAV, Bratislava

## V.2 International Cooperation

- ABB Corporate Research, Baden Daettwil, Switzerland
- University of West Bohemia, FEE Pilsen
- Technical University, Brno, CzR
- Czech Technical University, Prague, CzR
- Institute of Anorganic Chemistry, Academy of Sciences, Řež, CzR
- Piezoceram Ltd., Hradec Králové, CzR
- Motorpal, jsc Světlá Hora, CzR
- Silcotec Europe Ltd., Ireland
- PROTECH Group, Ltd., Klatovy, CzR
- Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, Germany
- EC JRC Ispra, Italy
- Solartec Ltd., Rožnov pod Radhoštěm, CzR
- Foundation for Research and Technology, MRG-IESL, Heraklion, Crete, Greece
- Global Green Challenge / WSC – World Solar Challenge, Adelaide, Australia
- Institute of Microelectronics and Optoelectronics, Warsaw University of Technology, Poland
- WREN - World Renewable Energy Network, Reading, UK
- UA of BAJA CALIFORNIA, Mexicali, Mexico
- Aristotle University, Thessaloniki, Greece
- Angel Kunchev University of Rousse, Bulgaria

## V.3 Membership in International Organizations and Societies

- M. Ružinský: Senior Member, IEEE - EDS (Electron Devices Society), USA
- M. Ružinský: WREN - World Renewable Energy Council /Network, UK
- V. Šály: WREN - World Renewable Energy Council /Network, UK
- A. Grusková: member of International Steering Committee EMFM

## V.4 Contracts

- Lelák, J. at al.: Long Time Combine Ageing Tests of Insulation Systems. Contract with ABB Corporate Research, Baden Daettwil, Switzerland

- Lelák, J. at al.: DC Ageing Tests on Outdoor Composite Insulators. Contract with ABB Corporate Research, Baden Daettwil, Switzerland
- Lelák, J. at al.: Treatment of Data&Signal Cables. Contract with Silcotec Europe Ltd. Ireland
- Lelák, J. at al.: Testing of High Voltage Conductor Joints. Contract with MURAT, s.r.o. Pezinok
- Lelák, J., Váry, M.: Expert Opinion on the Proposal and Detail the Implementation of Fire Protection Material PROMATEC Around the HV Bushing in Compressor Station. Contract with POSK, s.r.o. Bratislava
- Lelák, J., Analysis of Causes for the Existence of PD on 22 kV Cable 22-N2XS(F)2Y, Contract with: Takenaka EUROPE GmbH
- Lelák, J. at al.: Measurement of Dielectric Properties of Cables. Contract with VUJE jsc, Trnava VUJE
- Lelák, J. at al.: Ageing Tests on Model Coils. Contract with ABB Corporate Research, Baden Daettwil, Switzerland
- Lelák, et al.: Measurement of Water Trees on 110 kV Cable Samples According to the Method E DIN VDE 0276. Contract with ELBEZ s.r.o. Velké Meziříčí, Czech Republic
- Kopča, M., at al.: Measurement of Leakage Current of Water Heaters, Contract with HAKL Ltd., Bratislava

## **VI. THESES**

### **VI.1 Masters Theses**

Masters theses supervised at the Department of Electrotechnology. The names of supervisors are in brackets.

- [1] Hefner, R.: Design of an Off-Grid Photovoltaic System (J. Packa)
- [2] Perný, P.: Complex Impedance of Photovoltaic Cells (V. Šály)
- [3] Šimkovič, M.: Automated Workstation for Measurement of Dielectric Properties of Materials (V. Ďurman)
- [4] Zambor, L.: Nanoparticles of NiZn Ferrites as Fillers for Magneto-Composites (A. Grusková)

### **VI.2 Doctoral Theses**

- [1] Ďuriš, T.: DC and AC Electric Measurements of Photovoltaic Cells and Modules (V. Šály)

## **VII. OTHER ACTIVITIES**

- participation in Global Green Challenge 2009, Across Australia, 25-31 October as Scientific Support and Official Observer World Solar Challenge WSC 2009 (M. Ružinský)
- members of International Steering Committee of 'World Renewable Energy Congress XI', WREC 2010, Abu-Dhabi (M. Ružinský, V. Šály)
- member of Committee of Slovak Physical Society (A. Grusková)
- activities in: Renewable Energy World/PennWell's International Directories, 2009 (M. Ružinský)
- bilateral agreement, Socrates programme Higher education (ERASMUS) STU Bratislava - Angel Kunchev University of Rousse (V. Šály)
- participation in National Centre for Research and Application of Renewable Energy Sources
- the accredited educational activity 'The Education in the Area of Safety and Protection of Health at Work - § 21, § 22, § 23' (M. Kopča)
- the accredited educational activity 'The Electrical Minimum' (M. Kopča)

**VIII. PUBLICATIONS****VIII.1 Journals**

- [1] GONZÁLEZ-ANGELES, A., GRUSKOVÁ, A., SLÁMA, J., LÓPEZ-CUEVAS, J., SAUCEDA-MEZA, I., MÁRQUEZ-GONZÁLEZ, J., PITALÚA-DIAZ, N.: Magnetic and Structural Studies of (Sn,Ni-Sn) Substituted Barium Hexaferrites Synthesized by Ball Milling. In: Dyna-Colombia. - ISSN 0012-7353. - Vol. 76 (2009), p. 61-65. (in English)
- [2] KMENT, A., LELÁK, J., VÁRY, M.: Evaluation of Partial Discharge Phase Distribution on HV Cable with Cable Joint. In: Starnutie elektroizolačných systémov. - ISSN 1337-0103. - No. 7 (2009), p. 30-32. (in Slovak)
- [3] KOPČA, M.: Protection against the Atmospheric Electricity Aspects. Part 2. In: Elektrotechnický magazín. - ISSN 1210-5422. - Vol. 19, No. 9 (2009), p. 78-80. (in Slovak)
- [4] KOPČA, M.: Protection against the Atmospheric Electricity Aspects. Part 3. In: Elektrotechnický magazín. - ISSN 1210-5422. - Vol. 19, No. 10 (2009), p. 70-72. (in Slovak)
- [5] KOPČA, M.: Protection against the Atmospheric Electricity Aspects. Part 1. In: Elektrotechnický magazín. - ISSN 1210-5422. - Vol. 19, No. 7-8 (2009), p. 87-88. (in Slovak)
- [6] KOPČA, M.: Damage of Air Federline by Atmospheric Influence with Consecutive Influence on Electrical Installation of the Object and on Taking of Electrical Energy from Power Line Network. In: EE časopis pre elektrotechniku a energetiku. - ISSN 1335-2547. - Vol. 15, No. 2 (2009), Suppl. Volt, p. 4-5. (in Slovak)
- [7] KOPČA, M., RUSNÁK, J.: Inspection of the Electric Installations of the Houses amd Flats. In: EE časopis pre elektrotechniku a energetiku. - ISSN 1335-2547. - Vol. 15, No. 2 (2009), Suppl. Volt, p. 6-9. (in Slovak)
- [8] LELÁK, J., KMENT, A., VÁRY, M.: Comparement of Partial Discharge Occurance on HV Cable with Cable by Means of HV Measurements. In: Starnutie elektroizolačných systémov. - ISSN 1337-0103. - No. 7 (2009), p. 28-29. (in Slovak)
- [9] RUSNÁK, J., RUŽINSKÝ, M., IMAMURA, K., MATSUMOTO, T., ŠTEFEČKA, M., TAKAHASHI, M., KOBAYASHI, H., PINČÍK, E.: Investigation of Deep Interface Traps in Very-Thin Oxide/Si Structures Prepared at Low Temperatures Using Chemical Solutions. In: Materials Science Forum. - ISSN 0255-5476. - Vol. 609 (2009), p. 123-127. (in English)
- [10] RUŽINSKÝ, M.: F1 of Solar Cars. In: Stop. - ISSN 1335-0730. - Vol. 39, No. 13-14 (2009), p. 50-51. (in Slovak)
- [11] ŠÁLY, V., PACKA, J.: The Effectiveness of Utilization of Photovoltaic Sources. In: EE časopis pre elektrotechniku a energetiku. - ISSN 1335-2547. - Vol. 15, No. 2 (2009), p. 16-18. (in Slovak)
- [12] ŠÁLY, V.: Recycling of Photovoltaic Modules. In: EE časopis pre elektrotechniku a energetiku. - ISSN 1335-2547. - Vol. 15, No. 5 (2009), p. 18-19. (in Slovak)
- [13] SLÁMA, J., GRUSKOVÁ, A., UŠÁKOVÁ, M., UŠÁK, E., DOSOUDIL, R.: Contribution to Analysis of Cu-Substituted NiZn Ferrites. In: Journal of Magnetism and Magnetic Materials. - ISSN 0304-8853. - Vol. 321 (2009), p. 3346-3351. (in English)

- [14] SLÁMA, J., ŠIROKÝ, P., ŠOKA, M., GRUSKOVÁ, A., JANČÁRIK, V.: Frequency Analysis of Nickel Based Magnetic Dielectrics. In: Journal of Electrical Engineering. - ISSN 1335-3632. - Vol. 60, No. 1 (2009), p. 39-42. (in English)
- [15] RUŽINSKÝ, M.: World Solar Challenge 2009. In: Stop. - ISSN 1335-0730. - Vol. 39, No. 20 (2009), pp. 46-47 (in Slovak)

### VIII.2 Conference Proceedings

- [1] BUDAJ, J., VÁRY, M.: Effect of Thermal Ageing on Dielectric Parameters of FRNC. In: Diagnostics '09. An International Conference. Srní, Czech Republic, 9.-11.9.2009. - Pilsen: University of West Bohemia, 2009. - ISBN 978-80-7043-793-3. - p. 240-243. (in English)
- [2] DOSOUDIL, R., UŠÁKOVÁ, M., FRANEK, J., SLÁMA, J., GRUSKOVÁ, A.: Particle Size and Concentration Effect on Permeability and EM-Wave Absorption Properties of Hybrid Ferrite Polymer Composites. In: 19th Soft Magnetic Materials Conference. - Torino, Italy, 6.-9.9.2009. - Torino: INRIM, 2009. - E1-06. (in English)
- [3] ĎURIŠ, T., ŠÁLY, V., VINCZE, A., RUŽINSKÝ, M., PACKA, J., VÁRY, M., BAŘINKA, R., PORUBA, A., UHEREK, F.: Comparative Analysis of EVA and TPU Encapsulant Materials before and after Accelerated Ageing Procedure. In: 24th European Photovoltaic Solar Energy Conference: Hamburg, Germany, 21.-25.9.2009. - Munich: WIP-Renewable Energies, 2009. - ISBN 3-936338-25-6. - p. 3487-3489. (in English)
- [4] ĎURIŠ, T., ŠÁLY, V., ĎURMAN, V., PACKA, J., RUŽINSKÝ, M., BAŘINKA, R., PORUBA, A.: On Estimation of an Experimental PVB PV Module Properties. In: 24th European Photovoltaic Solar Energy Conference: Hamburg, Germany, 21.-25.9.2009. - Munich: WIP-Renewable Energies, 2009. - ISBN 3-936338-25-6. - p. 3313-3316. (in English)
- [5] ĎURIŠ, T., ŠÁLY, V., PACKA, J., VÁRY, M., BAŘINKA, R., PORUBA, A.: Tests of Photovoltaics Modules. In: Diagnostics '09. An International Conference. Srní, Czech Republic, 9.-11.9.2009. - Pilsen: University of West Bohemia, 2009. - ISBN 978-80-7043-793-3. - p. 70-73. (in Slovak)
- [6] ĎURMAN, V., ĎURIŠ, T., ŠÁLY, V.: Dielectric Properties of Encapsulating Materials for Photovoltaic Applications. In: APCOM 2009. Applied Physics of Condensed Matter: 15th International Workshop. Bystrá, Slovak Republic, 24.-26.6.2009. - Žilina: University of Žilina, 2009. - p. 182-185. (in English)
- [7] ĎURMAN, V., LELÁK, J., BUDAJ, J.: Identification of Mica Type Insulation Stratification in Motor Stator Winding. In: Diagnostics '09. An International Conference: Srní, Czech Republic, 9.-11.9.2009. - Pilsen: University of West Bohemia, 2009. - ISBN 978-80-7043-793-3. - p. 140-143. (in Slovak)
- [8] GAŠPAROVIČ, M., KOPČA, M., VÁRY, M.: Diagnostics and Hazard Minimalization of ESD Effects in Conditions of Electronic Manufacture. In: Diagnostics '09. An International Conference: Srní, Czech Republic, 9.-11.9.2009. - Pilsen: University of West Bohemia, 2009. - ISBN 978-80-7043-793-3. - p. 248-251. (in Slovak)
- [9] GONZÁLEZ-ANGELES, A., LIPKA, J., GRUSKOVÁ, A., SLÁMA, J., JANČÁRIK, V., SLUGEN, V.: Magnetic Comparison of BaCa and BaSr Substituted Hexaferrite Powders. In: ICAME 2009. International Conference on the Applications of the Mössbauer Effect: Vienna, Austria, 19.-24.7.2009. - Vienna: Institute of Solid State Physics, 2009. - p. 342. (in English)

- [10] GRUSKOVÁ, A., SLÁMA, J., UŠÁKOVÁ, M., SITEK, J., ŠOKA, M., JANČÁRIK, V.: Mössbauer Study of Be-Substituted NiZn Ferrites. In: APCOM 2009. Applied Physics of Condensed Matter: 15th International Workshop. Bystrá, Slovak Republic, 24.-26.6.2009. - Žilina: University of Žilina, 2009. - p. 239-242. (in English)
- [11] HLAVÁČ, P., POLJOVKA, P., DARULA, I.: Probabilistic Approach to Analysis of Power System Reliability. In: Power Engineering - Ecology - Economy: 8th National Conference with International Participation. High Tatras, Slovak Republic, 27.-29.5.2009. - Bratislava: STU, 2009. - ISBN 978-80-89402-08-3. - CD-Rom. (in English)
- [12] KMENT, A., LELÁK, J., VÁRY, M.: Measurement and Evaluation of Partial Discharge Occurance on HV Cable with Cable Joint. In: Elektroenergetika 2009: 5th International Scientific Symposium. Stará Lesná, Slovak Republic, 23.-25.9.2009. - Košice: TU, 2009. - ISBN 978-80-553-0237-9. - p. 252-254. (in Slovak)
- [13] LELÁK, J.: Department of Electrotechnology and Its Role at FEI STU. In: Electrotechnology 2009: Conference. Temešvár, Czech Republic, 7.-9.9.2009. - Prague: ČVUT, 2009. - ISBN 978-80-01-04379-0. - CD-Rom. (in Slovak)
- [14] LELÁK, J., KMENT, A., VÁRY, M.: Comparison of Partial Discharge Occurance on HV Cable with Cable Joint by Means of HV. In: Elektroenergetika 2009: 5th International Scientific Symposium. Stará Lesná, Slovak Republic, 23.-25.9.2009. - Košice: TU, 2009. - ISBN 978-80-553-0237-9. - p. 255-256. (in English)
- [15] PERNÝ, M., ŠÁLY, V.: Impedance Spectroscopy of Concentrator Photovoltaic Cells. In: ŠVOČ 2009. Proceedings of Winning Works. Bratislava, Slovak Republic, 29.4.2009. - Bratislava: FEI STU, 2009. - ISBN 978-80-227-3094-5. - CD-Rom. (in Slovak)
- [16] POLJOVKA, P.: Quality Management and what Else?. In: Modern Approaches to Corporate Management: 18th International Scientific Conference. Bratislava, Slovak Republic, 10.- 11.9.2009. - Bratislava: STU, 2009. - ISBN 978-80-227-3169-0. - p. 367-370. (in Slovak)
- [17] POLJOVKA, P., HELFER, D., SAFARGALEJEVA, G., RACHANOV, A.: Integrated Management Systems Implementation in Kazakhstan. In: Power Engineering - Ecology - Economy: 8th National Conference with International Participation. High Tatras, Slovak Republic, 27.-29.5.2009. - Bratislava: STU, 2009. - ISBN 978-80-89402-08-3. - CD-Rom. (in Russian)
- [18] ŠÁLY, V., PERNÝ, M., PACKA, J., ĎURIŠ, T., RUŽINSKÝ, M., BAŘINKA, R., PORUBA, A.: AC Equivalent Circuit Elements Behaviour of Concentrator Solar Cells. In: APCOM 2009. Applied Physics of Condensed Matter: 15th International Workshop. Bystrá, Slovak Republic, 24.-26.6.2009. - Žilina: University of Žilina, 2009. - p. 194-197. (in English)
- [19] ŠÁLY, V.: Photovoltaics on FEI STU. In: Electrotechnology 2009: Conference. Temešvár, Czech Republic, 7.-9.9.2009. - Prague: ČVUT, 2009. - ISBN 978-80-01-04379-0. - CD-Rom. (in Slovak)
- [20] ŠÁLY, V., PACKA, J., ĎURIŠ, T., PERNÝ, M., RUŽINSKÝ, M., PORUBA, A.: Impedance Measurements on Crystalline Silicon PV Cells. In: Diagnostics '09. An International Conference. Smí, Czech Republic, 9.-11.9.2009. - Pilsen: University of West Bohemia, 2009. - ISBN 978-80-7043-793-3. - p. 55-58. (in English)
- [21] SLÁMA, J., GRUSKOVÁ, A., ŠOKA, M., UŠÁKOVÁ, M., JANČÁRIK, V., FRANEK, J.: Analysis of Magnetic Properties the Substituted Li Ferrites. In: 19th Soft Magnetic Materials Conference. Torino, Italy, 6.-9.9.2009. - Torino: INRIM, 2009. - E1-16. (in English)

- [22] SLÁMA, J., UŠÁK, E., ŠOKA, M., GRUSKOVÁ, A., UŠÁKOVÁ, M., JANČÁRIK, V.: Analysis of Selected Be-Substituted NiZn Ferrites. In: 19th Soft Magnetic Materials Conference. Torino, Italy, 6.-9.9.2009. - Torino: INRIM, 2009. - E1-14. (in English)
- [23] VÁRY, M., LELÁK, J.: Cooperative Relaxation Processes in Bulk State Polymeric Systems during the Temperature Treatment. In: APCOM 2009. Applied Physics of Condensed Matter. Bystrá, Slovak Republic, 24.-26.6.2009. - Žilina: University of Žilina, 2009. - p. 202-205. (in English)

### VIII.3 Parts of Books

- [1] ĎURMAN, V., LELÁK, J., PACKA, J.: Potential Problems of Using Cable Protectors for Underground Power Cables. In: Elektroenergetika - 2008: International Scientific Forum. Sankt-Peterburg, Rossija, 15.-19.9.2008. - St.Peterburg: PEIPK, 2009. - ISBN 978-5-88718-051-X. - p. 518-521. (in English)
- [2] RUŽINSKÝ, M.: World Solar Challenge - Volunteers & Observers in Solar-Powered Racing. In: Renewable Energy 2009. - London: Sovereign Publ., 2009. - ISBN 978-1-906-136-52-0. - p. 96-99. (in English)
- [3] ŠÁLY, V., ĎURIŠ, T., PACKA, J.: Influence of Modified Front-Grid on Electric Properties of Multicrystalline Silicon Solar Cells. In: Elektroenergetika - 2008: International Scientific Forum. Sankt-Peterburg, Rossija, 15.-19.9.2008. - St.Peterburg: PEIPK, 2009. - ISBN 978-5-88718-051-X. - p. 497-501. (in English)

### VIII.4 Textbook

- [1] KOPČA, M., VÁRY, M.: Safety and Health at Work II: - Bratislava: FEI STU, 2009. - 113 p. - ISBN 978-80-227-3047-1. (in Slovak)