

UNIVERSITY OF ŽILINA



FACULTY OF ELECTRICAL  
ENGINEERING



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## Faculty of Electrical Engineering

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## FACULTY OF ELECTRICAL ENGINEERING

### Foreword

The Faculty of Electrical Engineering is a part of the University of Žilina - a modern university providing a full range of technological, economic, management, and a limited range of humanistic and natural science education at under-graduate, graduate and post-graduate levels.

During its 58-year existence the University has become a reputable institution with the firm position in the system of the Slovak higher education institutions. It was originally established in 1953 by the College of Railways in Prague. In 1959 the College changed its name to the University of Transport and in 1962 moved to Žilina. Afterwards, as a result of the increasing role of communications, the name was amended to the University of Transport and Communications. The year 1989 started a series of transformation and restructuralisation steps that brought essential changes into the academic life of the University and its Faculties and Institutes. They proved effective on the way towards a modern institution, featuring a character of a full-value university, named the University of Žilina since November 1996.

Nowadays the University of Žilina consists of 7 Faculties (important dates of their establishing and/or transformation are indicated in parentheses):

**Faculty of Electrical Engineering (1953; 1992)**

**Faculty of Mechanical Engineering (1953; 1992)**

**Faculty of Operation and Economics of Transport (1953)**

**Faculty of Civil Engineering (1990)**

**Faculty of Management Science and Informatics (1996)**, the former **Faculty of Management Science (1990)**

**Faculty of Special Engineering (1998)**, transformed from the former **Military Faculty (1952)**

**Faculty of Humanities (2010)**, transformed from the former **Faculty of Natural Science (1998)**

In addition to Faculties, the University also involves the following 12 Institutes:

- Institute of Physical Education (**UTV**)
- Institute of Continuing Education (**UCV**)
- Institute of Information and Communication Technologies (**UIaKT**)
- Institute of Forensic Engineering of the University of Žilina (**USI**)
- CETRA – Centre for Transportation Research (**CETRA-UD**)
- University Library (**UK**)
- Editorial Centre of University of Žilina (**EDIS**)
- Flight Training Organization – Air School of the University of Žilina (**LVVC**)
- National Training Centre of Security in Civil Aviation (**NVCB ŽU**)
- Institute of Competitiveness and Innovations (**UKAI**)
- Centre for Further Education of Teachers (**CDVU**)
- Institute of High Mountain Biology (**VUVB**)

### 1 Profile and structure of the Faculty of Electrical Engineering

As mentioned above, history of the Faculty of Electrical Engineering goes back to the year 1953. In 1959 it was merged with the Faculty of Mechanical Engineering and that symbiosis took 33 years. In 1992, after the split, the Faculty returned to its previous original name. It became the first technically oriented Faculty and generally the second Faculty in the Slovak Republic awarded the Quality Certificate for quality control system according to ISO 9001 (in 2003). Since that time further two successful re-certifications occurred (2007; 2010).

### **Structure of the Faculty**

From a structure point of view, the Faculty of Electrical Engineering (FEE) consists of nine Departments (seven located directly in Žilina, two at the Satellite work place in Liptovský Mikuláš), the Service centre and the Dean's office. Scientific and research activities, properly projected to educational activities, are dynamically developed as a response to floating markets seen within both national and pan-European context. At the very beginning, activities of the oldest departments were mainly oriented on technical aspects of classical transport, its safety and problems of technical operation of telecommunications. At present scientific and research activities address the latest problems of information and communication technologies, safety-related control of transport and industry processes, telecommunication engineering, power electronic systems, modern control of electric networks and others. Besides, such interdisciplinary fields as mechatronic and biomedical engineering are also developed. The FEE's Departments are listed below:

- Department of Physics (DPh)
- Department of Measurement and Applied Electrical Engineering (DMAEE)
- Department of Electromagnetic and Biomedical Engineering (DEBE)
- Department of Mechatronics and Electronics (DME)
- Department of Power Electrical Systems (DPES)
- Department of Control and Information Systems (DCIS)
- Department of Telecommunications and Multimedia (DTM)

Departments situated at the Satellite work place in Liptovský Mikuláš:

- Department of Engineering Fundamentals (DEF)
- Department of Experimental Electrical Engineering (DEEE)

In the field of technical physics, the pedagogical and scientific-research activities of **the Department of Physics** are oriented mainly into two basic fields of physics. Traditionally, one group of the Department staff is aimed to the utilization of acoustic methods for the investigation of condensed matters. A wide range of acoustic methods and techniques, utilizing also the acoustoelectric and acoustooptic phenomena, are used at investigation of semiconductors, metals, dielectrics and amorphous materials. The second group studies physical properties of the conventional telecommunications optic fibres, twin core optic fibres, photonic crystal fibres, biological photonic structures and semiconductor laser diodes based on quantum wells. Self-diffraction of light in magnetic fluids and photorefractive phenomenon in selected condensed matter materials are also studied within the group. In last years the research programme was extended to theoretical study in the field high-energy physics. One research group works in the area of standard model phenomenology of electroweak interactions, namely studies of the electroweak symmetry breaking.

Scientific and research activities at **the Department of Measurement and Applied Electrical Engineering** is mainly oriented on diagnostic methods and systems for power transformers, electric machines and equipment. Recently, the Department extended its programme by infrared analysis (thermo diagnostics), sensing and mathematic-physical modeling and simulations of reduction of power and telecommunication equipment. The Department also investigates the possibilities of thermo vision applications in the medical diagnostic field. The research programme has been extended to electromagnetic non-destructive testing and evaluation of metals and dielectric materials. Research also covers optimization of methods for materials dielectric properties investigation in high-frequency region and possibilities of microwave technique utilization in medical diagnosis, therapeutic applications and in optimization of radiocommunication passive equipments.

**The Department of Electromagnetic and Biomedical Engineering** is aimed to the investigation of electromagnetic field and its interactions with various environments including biological one, to the electromagnetic methods and means of non-destructive control of conducting materials with orientation on biomaterials – materials of implants, to the questions of compatibility and bio-compatibility, to the technical facilities of medicine, mainly biomedical sensors, then to the modeling and simulations of dynamic biological systems for the use in medical diagnostics, as well as to the biomedical signals processing. The interdisciplinary area of biomedical engineering is developed in close co-operation with the Jessenius Medical Faculty of Comenius University in Martin, both in pedagogical field and scientific-research activities.

Scientific and research activities of the **Department of Mechatronics and Electronics** are oriented on operation of quality- and reliable electronic devices and systems, applications of programmable logic arrays at the design of electronic systems, study of reconfigurable circuits as well as diagnostics and image-based analysis of failures. Topology optimization of the power semiconductor converters and its electro-magnetic compatibility belong to the main activities of the Department.

Pedagogical and scientific-research activities at the **Department of Power Electrical Systems** are oriented on three basic fields, which blend together. The everyday teaching is supported by the results of scientific-research activity. In the field of *Electric Power Systems* the main emphasis is laid on the production of electric energy from classic and renewable resources, the transmission and distribution of electricity supply system, the quality of electric energy and monitoring of unfavourable feedback effects of devices on supply network. In the field of *Electric Drives* the attention is paid to the construction and principles of electric drives functioning, the possibilities of its supply and control by means of modern electrical devices and its consecutive integrating into bigger technological units. A special attention is given to the electronically commuted electric machines, electric machines with permanent magnets, as well as to the properties of inharmonically supplied electric machines. In the field of *Electric Traction* the most important topics seem to be modern traction drives for all kinds of transport and solving the problems of supplying electric traction equipment.

The activities of the **Department of Control and Information Systems** are mainly oriented on problems of increasing safety and efficiency of information transmission within an automated system of transport control, modernisation of safety facilities, implementation of remote-control and remote-monitor computer-based systems. The most prospective fields are safe and reliable information transmission and processing as well as information technologies. Research activities of the Department staff are directed on the sphere of information and safety-related system analysis and synthesis ranging from solutions of theoretical models to practical projects of operation including implementation. There are many sectors of activities in which the Department has an exclusive position in the Slovak Republic, especially in expertise processing in the field of analysis and synthesis of railway interlocking systems. The sphere of reliable and safe information transmission and processing in control of selected critical processes, both in safety-related systems for all kinds of transport, complex technologies and in security systems for protection of humans and property, provides dynamic incentive for all the staff.

**The Department of Telecommunications and Multimedia** covers wide scope related to communication technologies and processes in education and research. Professional activities are connected to specialized laboratories. In the field of telecommunication technologies, attention is focused on problems of communication networks, access technologies, convergence of network technologies with main activities oriented on quality of media services. In term of fixed networks, the Department has significant activities

in the field of research and development technologies for broadband fully optical networks. This field is closely associated with research activities at the Department of Physics. Wireless technologies are oriented on mobile and satellite communications, positioning systems as well as to DVB-x. The field of digital signal processing is a very important research area, especially seen from the view of semantic analysis and annotation of audio and video signals. Relatively new field at this Department are multimedia technologies. In this case, main orientation is focused on technological part and also on part of multimedia content creation. It is represented by image composition, stylistics and work with multimedia data. The main target of this area is the support of future multimedia services.

The scientific and research activities at the **Department of Engineering Fundamentals** are oriented on real functions in mathematics, on diagnostics of material properties of thin film and multi surface semiconductor and dielectric systems and morphological properties of its surfaces and interfaces in physics. One member of the Department works on research of alternative energetic sources. The attention is also given to the design and simulation of transmission properties of optical elements for high-speed optical communication systems and access networks. Scientific activities of the Department are based especially on traditional fruitful co-operation with the Slovak Academy of Sciences, and with many Slovak and foreign universities. As a result of this, the Joint Laboratory for thin film structures, its surfaces and interfaces was established on the base of Agreement between the University of Žilina and the Institute of Physics, Slovak Academy of Sciences, Bratislava.

Research activities of the **Department of Experimental Electrical Engineering** are concerned on alternative energy sources with emphasis on concentration solar power engineering. The activity is oriented on data collection needed for management and monitoring of solar power engineering. In addition, the Department staff solves the tasks of algorithm design of adaptive and fuzzy control and microprocessors applications in solar power engineering. The Department staff uses the graphical development environment LabView for modeling and simulation, and for connection with real environment in measurement and control systems.

In virtue of the mentioned scientific, research and educational activities the following Table 1. shows distribution of pedagogical and research staff at the FEE.

Department	Pedagogical staff		Research staff	
	Full-time	Part-time	Full-time	Part-time
DPh	16	1	5	0
DMAEE	9	0	1	0
DEBE	10	0	3	0
DME	10	4	4	2
DPES	15	1	3	0
DCIS	14	2	2	0
DTM	21	3	2	0
DEF – SWP LM	5	0	0	0
DEEE – SWP LM	4	1	1	0
Centrum of mechatronic systems research	0	0	0	0
Dean's office	0	0	1	0
<b>Total</b>	<b>104</b>	<b>12</b>	<b>22</b>	<b>2</b>

Tab. 1 Number of pedagogical and research employees at the departments of the FEE up to 31.12.2011

Number of employees at the Faculty according to the categories in particular years can be seen in Table 2.

	2005		2006		2007		2008		2009		2010		2011	
	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time
Prof.	17	2	17	-	12	1	15	-	15	-	16	-	17	1
Guest Prof.	-	1	-	1	-	1	-	1	-	1	-	1	-	1
Assoc. Prof.	30	6	28	-	42	8	31	-	31	-	28	-	28	-
Guest Assoc.Prof.	-	4	-	1	-	1	-	-	-	-	-	-	-	-
Senior Lecturer	53	10	54	11	44	2	51	18	56	8	57	13	58	8
Lecturer	-	-	2	-	1	-	-	-	-	-	-	-	-	-
Lector	2	-	2	-	1	1	1	1	1	-	1	1	1	2
Techn. Adm. Staff	40	1	40	-	40	1	38	1	37	1	38	1	37	1
Research Staff	23	4	18	6	19	4	11	8	17	9	20	5	22	2
<b>Total</b>	<b>165</b>	<b>28</b>	<b>161</b>	<b>19</b>	<b>159</b>	<b>19</b>	<b>147</b>	<b>29</b>	<b>157</b>	<b>27</b>	<b>161</b>	<b>20</b>	<b>163</b>	<b>15</b>

Tab. 2 Number of employees at the FEE according to the categories 2005-2011

### Highlights

To the most important events in the year 2011, these have undoubtedly included:

- In the area of education, the successful accreditation of a new study programme called *Multimedia engineering* in 2<sup>nd</sup> study degree and re-accreditation of study programmes *Control Engineering* in 1<sup>st</sup> study degree and *Process Control* in 2<sup>nd</sup> study degree
- In the area of staff policy, the continued graduation growth of the staff of the Faculty (appointed 2 new professors and 3 associate professors)
- Upgrading hardware and software of research and teaching laboratories of the Faculty in a total value of 907 626 € (financed by the structural funds)
- The completion of several national and international research projects (e.g. project A-0930-RT-GC Helicopter fuselage crack monitoring and prognosis through on-board sensor (HECTOR) funded by the European Defence Agency ED)
- Continued rise in assessments of academic rating and ranking agency ARRA at 5<sup>th</sup> place between the Slovak faculties of the technical focus (2010:7, 2009:13, 2008:17)
- Organization or co-organization of several scientific events (e.g. ALER 2011, APCOM 2011, DT'11, EURO-ŽEL 2011, 17<sup>th</sup> Conference of Slovak and Czech physicists, Physics Masterclasses 2011, Seminar in the frame of project POPULAS, special section on ACIIDS 2011, eSeminar "RFID identifiers", and others)
- In the framework of cooperation with industry, except the solution of specific tasks of research, development and business practice, creating the Competence Centre for intelligent transport systems with the IBM Slovakia

## 2 Educational activities

Within the 3-degree study system the Faculty of Electrical Engineering has the following accredited study programmes and competence according to the Law about Universities No. 131/2002 to make state examinations in the following study programmes:

**Study programmes of the 1<sup>st</sup> study degree – Bachelor study**

- Electrical Engineering
- Multimedia Technologies
- Digital Technologies
- Telecommunications
- Control Engineering
- Biomedical Engineering

**Study programmes of the 2<sup>nd</sup> study degree – Master study**

- Electric Traction \*
- Electric Power Systems (Electroenergetics)
- Electric Drives
- Multimedia Engineering \*\*
- Power Electronic Systems
- Process Control
- Telecommunication and Radiocommunication Engineering
- Biomedical Engineering

\* In view of the continuing disinterest of students in this study programme, it will not appear in the menu in the following academic years. It is possible to focus on the Electric traction by selecting the corresponding compulsory optional subjects in the study programme Electric drives.

\*\* Newly accredited study programme at the conclusion of the year 2011.

**Study programmes of the 3<sup>rd</sup> study degree – Doctoral study**

- Telecommunications
- Theoretical Electrical Engineering
- Power Electrical Engineering
- Process Control
- Electric Power Systems
- Electrotechnologies and Materials

**Students**

A summary number of students of the FEE according to particular study degrees and study forms are presented in Table 3 to Table 6. The Faculty has had **1 657 students** in total, of it:

- In full time Bachelor study: 1 076 students,
- In full time Master study: 404 students,
- In full time Doctoral study: 76 students,
- Total in full time study: 1 556 students,
- Total in part time study: 101 students.

Study programme	Number of students up to 31 October 2011			
	Full-time study			Part-time study
	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	2 <sup>nd</sup> year
Electrical Engineering	146	97	97	49
Control Engineering	61	35	49	-
Telecommunications - Žilina	111	57	76	-
Digital Technologies/ Telecommunications – SW Liptovský Mikuláš	56	38	50	-
Multimedia Technologies	34	27	42	-
Biomedical Engineering	34	34	32	-
Total	442	288	346	49
<b>Total Bachelor study</b>	<b>1076</b>			<b>49</b>

Tab. 3 Number of Bachelor students



Study programme	Number of students up to 31 October 2011		
	Full-time study		Part-time study
	1 <sup>st</sup> year	2 <sup>nd</sup> year	1 <sup>st</sup> year
Electric Traction	0	0	-
Electric Drives	19	8	-
Electric Power Systems (Electroenergetics)	38	22	-
Power Electronic Systems	39	20	-
Process Control	24	35	23
Telecommunication and Radiocommunication Engineering	82	90	-
Biomedical Engineering	15	12	-
Total	217	187	23
<b>Total Master study</b>	<b>404</b>		<b>23</b>

Tab. 4 Number of Master students

Study programme	Number of students up to 31 October 2011							
	Full-time study			Part-time study				
	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year	5 <sup>th</sup> year
Telecommunications	7	7	15	1	2	2	3	-
Theoretical Electrical Engineering	1	1	3	-	-	-	-	-
Power Electrical Engineering	4	6	10	2	1	1	2	-
Process Control	3	4	10	1	-	3	1	7
Electric Power Systems	1	2	-	2	-	-	-	-
Electrotechnologies and Materials	-	1	1	1	-	-	-	-
Total	16	21	39	7	3	6	6	7
<b>Total Doctoral study</b>	<b>76</b>			<b>29</b>				

Tab. 5 Number of Doctoral students

Academic year	Total	Full-time	Part-time
2002/2003	79	23	56
2003/2004	86	26	60
2004/2005	100	39	61
2005/2006	113	48	65
2006/2007	78	40	38
2007/2008	70	38	32
2008/2009	76	49	27
2009/2010	106	81	25
2010/2011	92	73	19
2011/2012	105	76	29

Tab. 6 Overview of Doctoral students since 2002

In 2011 the following numbers of students graduated from the FEE:

- 239 students in the 1<sup>st</sup> study degree,
- 184 students in the 2<sup>nd</sup> study degree,
- 12 students in the 3<sup>rd</sup> study degree.

### Admission for study

Admission proceeding at the Faculty of Electrical Engineering is based on the selection procedure according to the Law about Universities No. 131/2002. When selecting and admitting new students for 1<sup>st</sup> study degree, the main emphasis is paid to the type of a graduated secondary school and results achieved during study, including results from the leaving examinations. The graduates of secondary grammar schools and secondary electro-technically oriented industrial schools with average results from mathematics and physics at the year-end and/or school-leaving certificates up to 2,00 are accepted without entrance examination. Others, i. e. the graduates of non-electrotechnical secondary vocational schools and the graduates of secondary grammar schools and secondary electro-technically oriented industrial schools with average results above 2,00 have to pass entrance examination.

In a tender for 2<sup>nd</sup> study degree were taking into account the results of Bachelor study of candidates. Without a tender were accepted those applicants, who have completed a Bachelor degree with honors, or reached a weighted average to 2,00 including. The other candidates were listed on the ranking list established on the basis of weighted averages for the whole Bachelor study.

The selection procedure for 3<sup>rd</sup> study degree took the form of an interview with each tenderer separately before the admission committee. One part of the content of the interview is focused on finding the outline of the tendered in the professional field, related to the chosen topic of the Doctoral study and the next part, aimed to verify the knowledge of foreign languages and the assumptions on the individual scientific work. The order of candidates is drawn up by the Commission in the secret ballot.

Number of applicants and number of enrolled students can be seen in Tables 7.-9.

Study programme	Number of applicants for study	Number of enrolled students
Electrical Engineering	295	143
Multimedia Technologies	127	33
Telecommunications	249	110
Digital Technologies	108	57
Control Engineering	147	54
Biomedical Engineering	80	34
<b>Total</b>	<b>1 006</b>	<b>431</b>

Tab. 7 Number of applicants and students enrolled into the 1<sup>st</sup> year of Bachelor study in full-time courses in the academic year 2011/2012

Study programme	Number of applicants for study	Number of enrolled students
Biomedical Engineering	15	15
Electric Power Systems (Electroenergetics)	49	37
Electric Drives	11	19
Process Control	29	23
Telecommunication and Radiocommunication Engineering	91	81
Power Electronic Systems	44	37
<b>Total</b>	<b>239</b>	<b>212</b>

Tab. 8 Number of applicants and students enrolled into the 1<sup>st</sup> year of Master study in full-time courses in the academic year 2011/2012

Study programme	Number of applicants for study	Number of enrolled students
Electric Power Systems	1	1
Electrotechnologies and Materials	-	-
Process Control	4	3
Power Electrical Engineering	4	4
Telecommunications	9	7
Theoretical Electrical Engineering	2	1
<b>Total</b>	<b>20</b>	<b>16</b>

Tab. 9 Number of applicants and students enrolled into the 1<sup>st</sup> year of Doctoral full-time study in the academic year 2011/2012

### **Evaluation of teaching quality**

- The FEE in co-operation with the management of the University of Žilina prepared and offered to the students anonymous inquiries realized in an electronic form within the e-learning system asking for feedback on quality of educational process and teachers. However, despite the co-operation with the Student Association there is still relatively small interest of students in filling in inquiries and evaluating the education quality. Therefore, in selected courses the old paper-form inquiry system has been kept, too. On the basis of the processing of the results of the questionnaires, the heads of departments in the presence of competent teachers have carried out an evaluation of the teaching quality and defined next progress for the improvement of teaching in complex annual evaluation of the staff.
- The FEE has been a holder of the Quality Certificate for quality control system according to STN ISO 9001 since 2003. Certificate evaluates all processes at the Faculty, mainly the education, and it was renewed in 2010 and has validity until 2015 with the annual verification of results.
- Each study program of Bachelor and Master degree offers to students the courses in the area of social sciences, psychology, economics and law, too.
- Since 2004 the FEE has used complex software system for support of e-learning, which enables access into e-learning blocks, test and examination, organizational provision of study. The FEE claims from pedagogical staff active usage of the e-learning system and at the same time it makes conditions for e-learning development.
- The FEE participates in a student mobility system. Number of outgoing students is currently higher than number of incoming students. Also the interest of the students on departure is declining. The faculty management regularly deals with this issues and take measures to support student mobility.
- The FEE supports the development of interdisciplinary, multidisciplinary, distance and lifelong learning; and education of world languages mainly by young employees.
- Since 1994 the FEE has had credit system for Bachelor and Master study degrees. Since 2005 it has had credit study system for all study degrees at the FEE. System enables uniform evaluation of study results in the frame of EU and markedly makes simpler realization of mobility and achieved results. According to the Regulations of the Ministry of Education of the Slovak Republic, the Faculty came in the academic year 2008-2009 to the evaluation system of students load during the semester without "pre-credits".
- The FEE in successive steps creates no barrier conditions for disabled students; there is a contact person responsible for help and life coordination of disabled students (individual study schedule, etc.).
- The FEE has an elaborated system for provision of courses with suitable study literature (textbooks, scripts), making e-books and e-materials, and also with quality teaching staff.
- The FEE has elaborated practises and principles of recognition of study results achieved by study mobility at other institutions.

- The FEE has elaborated practises of active propagation of offered study programs at selected grammar-schools and secondary schools. Traditionally at the beginning of the calendar year (in the year 2011 it was on 21<sup>st</sup> January) the FEE regularly organizes a so called "Open Door Day at the FEE".
- The FEE supports realization of pedagogical training, especially for young and new teachers of the University of Žilina and PhD. Students.
- The FEE motivates talented students for independent and creative activity in the form of student scientific technical competition, scientific assistants by participating in solving of research projects and projects associated with development of pedagogical and research activities of departments.
- Faculty provides to students benefit scholarships for excellent study results. In 2011, these scholarships have been awarded to 134 students, on the basis their weighted averages. Further, the extraordinary students receive scholarship for work and exemplary representation of faculty and university in the field of science, education, culture and sport. In 2011 so were rewarded 51 students.
- The excellent results of the employees and students of the faculty are continuously published on the website of the faculty.
- The FEE within the frame of the Alumni Club (KAP EF) helps graduates to integrate into work process and keeps in touch with them.

### 3 Scientific-research activities

In addition to education, the scientific-research is the primary subject of the activity at the Faculty and its development is a necessary assumption of future development since it is closely related to quality of education. Scientific-research activities of the Faculty are realized especially in the form of projects and are mainly based on scientific-research activities of individual departments and their co-operation. One of considerable outcomes of scientific-research activities are scientific and professional publications in quality journals and international conferences, indexed in international databases.

The most important forms of projects are international scientific projects, projects of the state programme of research and development, mainly projects financed by European structural funds, then projects supported by the Scientific Grant's Agency of Ministry of Education (VEGA, KEGA), and APVV projects. Business co-operation with companies in the field of applied research is very important, too.

#### ***Grant and Faculty's projects and co-operation with external bodies***

In 2011 at the FEE were solved together 70 grant's projects (VEGA – 21, KEGA – 4, APVV– 18, European structural funds – 25, others – 2).

<b>Project Number</b>	<b>Name of the project</b>	<b>(Sub-)Coordinator</b>
VEGA 1/0683/10	Design, fabrication and diagnostics of the microstructural optic fibres for sensoric and photonic applications	Ivan Martinček
VEGA 2/0077/09	Influence of various nanoparticles on structural transitions in ferromagnetics and on dielectric properties of magnetic fluids	Peter Bury
VEGA 1/1058/11	NSOM lithography and interference lithography as progressive methods for preparation of photonic structures and optoelectronic elements with photonic structure	Dušan Pudiš
KEGA 075-008ŽU-4/2010	Development of Core Competences of Technical University Students in Physics Education	Peter Hockicko

KEGA 002KU-4/2011	Development of Scientific Literacy in University Preparation of Students of Pre-school and Elementary School Pedagogy	Peter Hockicko
VEGA 1/0474/09	Research of Topology and Control of Power Electronic Supply System with Single-Phase HF Input and Two-Phase Orthogonal Output for Two-Phase SM/IM Electrical Motors	Branislav Dobrucký
VEGA 1/0207/10	The Development of Mechanical Subsystem of Tripod and Hybrid Kinematic Structure for Application in the Area of Production Machines and Robots	Viera Poppeová-FME Peter Šindler
VEGA 1/0943/11	Research of Adaptive Multi-Tank Power System for Renewable Energy Sources	Pavol Špánik
VEGA 01/1099/11	Modelling and Simulation of Environment Dynamic Interaction of Driver–Car–Transport Instantiation	Mikuláš Alexík-FMSI Branislav Dobrucký
KEGA 086-051ŽU-4/2010	The Development of Specialized Unit for Teaching of Parallel Kinematic Structures Application in the Area of Production Machines and Robots	Viera Poppeová-FME Peter Šindler
V-1-0548-09	Diagnostics of Power Transformers in Consideration of Short Currents and Over Currents Effects	Miroslav Gutten
V-1/0007/09	Systems of Radio Broadcasters Thermodiagnosics	Milan Šimko
V1/0193/10	Research of Selected Factors Influence for Gigacycle Fatigue of Materials	O. Bokúvka-FME Dagmar Faktorová
VEGA 1/0392/10	The Research of Mobile Nodes Positioning in Wireless Sensor Networks	Peter Brída
VEGA–1/0336/10	Improvement of QoS Parameters in MANET and Mesh Networks	Vladimír Wieser
VEGA–1/0570/10	Algorithms Research for Automatic Analysis of Multimedia Data	Róbert Hudec
VEGA–1/0655/10	Algorithms for Scanning and Transmission and Reconstruction of 3D Picture in 3D IP TV	Roman Jarina
VEGA 1/0765/11	Research on Application Possibilities of Eddy Currents Non-harmonic Excitation in Quantitative Non-destructive Evaluation of Conductive Materials	Ladislav Janoušek
VEGA 1/0927/11	Research of the New Approaches to Monitoring and Evaluation of Biomaterials by Electromagnetic Methods	Klára Čápková
VEGA 1/0038/09	Regulation of Excitability and Respiratory Motor Output under Coughing and other Reflexes from Breathing System in Anaesthetized Casts and Rabbits	Ján Jakuš, JLF UK Martin Ivo Čáp
VEGA 1/0809/10-V-10-008-00	Scientific research, modeling and simulation of transient events with the electrical systems of wind turbines	Pavol Rafajdus
VEGA 1/0355/11-V-11-023-00	Optimal control techniques for lowering of alternating electric drives losses	Ján Vittek
KEGA-K-09-003-00	Integration of renewable energy laboratory in the educational process through an interactive multimedia Web interface	Juraj Altus
VEGA 2/0070/10	Physical properties of the passivated a–Si:H based structures	Emil Pinčík-SAS Jarmila Müllerová
VEGA–2/0411/10	A study of alternative solutions for mitigation of impairments due to polarization mode dispersion in high-speed optical networks	Jarmila Müllerová

Tab. 10 Grant's projects VEGA and KEGA solved at the FEE in 2011

<b>Project Number</b>	<b>Name of the project</b>	<b>(Sub-)Coordinator</b>
APVV LPP-0059-09	Revealing microworld mysteries through experimental data analysis	Ivan Melo
APVV SK-PL-0021-09	Ultrarelativistic Heavy-ion Collisions 2010-2011	Ivan Melo
APVV LPP-0067-07	Searching and Education of Talented Students at Primary and Secondary Schools in Science by means of Talents' Competitions	Ivo Čáp Jozef Kúdelčík
VMSP-P-0085-09	Galvanotechnological System with Synchronous Rectifier	Jozef Čuntala
LPP-0366-09	High Frequency Power Electronic Converters	Pavol Špánik
APVV-0138-10	Research and Development of the Small Power Drives with Two-phase Motors	Branislav Dobrucký
SK-RO-0015-10	Metamaterials for Non-destructive Testing of High-frequency Electromagnetic Methods	Dagmar Faktorová
APVV-0703-10	Analysis and Diagnostic Measurements of Power Transformers using by Sweep Frequency Response Analysis	Ján Michalík
APVV VMSP-P-0142-09	Development, research and implementation of supplemental road signalling for safety on railway crossings and cross walks	Juraj Spalek
APVV SK-PL-0015-09	Safety appraisal of railway safety systems	Karol Rástočný
APVV-LPP-0126-09	Progressive Mobile Positioning in Indoor Environment by Means of Wireless Networks	Ján Dúha (Peter Břida)
APVV-LPP-0216-09	The Science and Research Popularisation in ICT Technology Area at Secondary Technical Schools	Róbert Hudec
APVV-0349-010	Towards Electromagnetic Induction Based Methods to Meet their True Potential in Non-destructive Monitoring of Conductive Structures	Ladislav Janoušek
APVV-0194-07	Research on Methods for Enhancing the Information Rate of Signals in Quantitative Non-destructive Evaluation of Conductive Materials	Ladislav Janoušek
APVV-0560-07	Fault Localization in 22 kV Power Network by Using the Elements of Artificial Intelligence	Juraj Altus
APVV SK-CN-0020-09	Investigation of electromagnetic design of switching linear reluctance motor	Pavol Rafajdus
APVV SK-RO-0016-10	Improvement of switching reluctance motor properties for enhancement of industrial processes safety	Pavol Rafajdus
APVV-0577-07	Research and optimization of parameters of c-Si and poly-Si MIS solar cells	Emil Pinčík-SAS Jarmila Müllerová

Tab. 11 The APVV projects solved at the FEE in 2011

<b>Project Number</b>	<b>Name of the project</b>	<b>(Sub-)Coordinator</b>
ITMS 26220120003	Centre of Power Electronic Systems and Materials for their Components, Operational Program Research and Development I	Pavol Špánik Branislav Dobrucký Peter Bury
ITMS 26220120046	Centre of Power Electronic Systems and Materials for their Components, Operational Program Research and Development II	Pavol Špánik Branislav Dobrucký Peter Bury
ITMS 26220120004	Centre for Experimental and Clinical Respiriology I	Miroslav Hrianka
ITMS 26220120034	Centre for Experimental and Clinical Respiriology II	Miroslav Hrianka
ITMS 26220220019	Ciliary Kinetics Measurement of Respiratory Tractus	Miroslav Hrianka
ITMS 26110230004	Systemisation of Advanced Technology and Knowledge Transfer between Industrial Sphere and University Environment	Milan Šaga-FME Pavol Špánik Branislav Dobrucký
ITMS 26110230005	Flexible and Attractive Study at University of Žilina for Needs of Labour Market and Knowledge Society	Renáta Švarcová- Rector's Office

ITMS 26220220078	Research of High-Economic components of Electric Drive Systems of Driving Traction Vehicles and Urban Mass Transportation Vehicles	Pavol Špánik
ITMS 26220220046	The Development of Parallel Kinematic Structures Prototypes for Application in the Area of Production Machines and Robots	Viera Poppeová-FME Peter Šindler
ITMS 26220220048	Unique Equipment for Valuation of Tribocorrosive Properties of Machine Components Surface	B. Hadzima- FME Dagmar Faktorová
ITMS 26220120028	Centrum of excellence for Systems and Services of Intelligent Transport I	K. Matiaško-FMSI Researchers from DTM, DCIS
ITMS 26220120050	Centrum of excellence for Systems and Services of Intelligent Transport II	K. Matiaško-FMSI Researchers from DTM, DCIS
ITMS 26220220089	New measurement methods for physical dynamical parameters and interactions of traffic stream motor vehicles and roadway	Aleš Janota
ITMS 26220220049	Development of modular robotic systems - VMROS	Milan Gregor-FME Researchers-DCIS
ITMS 26220220009	Intelligent modular system for components quality control - InMoSysQC	Branislav Mičieta, Milan Gregor-FME Researchers-DCIS
ITMS 26220220021	Centre of Translation Medicine	UK Bratislava Researchers from DTM, DCIS
ITMS 26220220153	Competence Centre for Research and Development in Diagnosis and Therapy of Carcinoma	Ján Michalík Researchers from DEBE, DCIS, DTM
ITMS 22420320001	Interregional Mobile Television DVB-H	Researchers-DTM
ITMS 26220220022	Design of New Diagnostic Algorithm for Selected Tumour Affections	Researchers from DTM
ITMS 26220220134	Research of Technologies and Products for Intelligent and Technical Fabrics	Ján Šesták, VÚTCH-CHEMITEX Researchers from DTM, DEBE
ITMS 26220220415	Broker Centre of Aviation Technology Transfer and Expertise in Transport and Transport infrastructure	Alena Otčenášová, Researchers-DTM
ITMS 26250120021	Modernisation of infrastructure University of Žilina, focusing on ICT	Milan Malcho-FME Milan Trunkvalter
ITMS 26250120046	Infrastructure Support to improve the conditions of the educational process	Milan Malcho-FME Jarmila Müllerová Milan Trunkvalter
ITMS 26220220121	Modification and Verification of Surgical Tools	R.Konečná-FME Researchers-DEBE
ITMS 26220220088	Applied Research and Development of Inovative Energy Resources for Ultra High Pressure Pulses	Ecoland s.r.o. Pavol Rafajdus

Tab. 12 Projects of the European structural funds solved at the FEE in 2011

Project Number	Name of the project	(Sub-)Coordinator
Support of the Ministry of Defence of SR	SEOP-17-13/2011-OdPP : Helicopter fuselage Crack monitoring and prognosis through on-board sensor network (HECTOR)	Róbert Hudec
Operational programme - Education	The Creation of new educational programs in training for the automotive industry II.	L.Galbavý-National Institute Researchers-DPES

Tab. 13 Other Projects solved at the FEE in 2011

**Conferences and seminars**

The following scientific and special undertakings were organized at the Faculty in 2011:

- 17<sup>th</sup> International Conference Applied Physics of Condensed Matter, APCOM 2011, Vysoké Tatry, Nový Smokovec, June 22-24, 2011 (chairman of the scientific committee: Peter Bury, Members of the organizing committee: Dušan Pudiš, (chairman), Igor Jamnický, Ivan Martinček, Ivana Kubicová, Ľuboš Šušlik, Organized by: Department of Physics and Department of Engineering Fundamentals FEE University of Žilina, Department of Physics, Department of Microelectronics and Department of Nuclear Physics and Technology FEEI STU, Bratislava, Slovak Physical Society)
- 17<sup>th</sup> Conference of Slovak and Czech Physicists, Žilina, September 5-8, 2011 (member of the scientific committee: Peter Bury, members of the organizing committee: Peter Bury, Peter Hockicko, Jozef Kúdelčík, Marián Janek, Daniel Káčik)
- National High School Competition Cascade, <http://fyzika.uniza.sk/cascade/>, Ivan Melo, Mikuláš Gintner, Gabriela Tarjányiová
- IPPOG (International Particle Physics Outreach Group) meeting, Košice April 14-16, 2011, members of the organizing committee: Ivan Melo (Chairman), <http://hep.upjs.sk/EPPOG/>
- Masterclasses Workshop Košice (LHC data released for educational purposes for the first time) - live interview for Slovak Radio1. Organizers and lecturers: Ivan Melo, Mikuláš Gintner, February 15-16, 2011 UPJŠ Košice
- 7<sup>th</sup> International particle Physics Masterclasses 2011, University of Žilina, March 17, 2011 (Gabriela Tarjányiová, – main coordinator, Ivan Melo, – national coordinator, Mikuláš Gintner, Beáta Trpišová, Jozef Kúdelčík, Ivana Kubicová, Marián Janek, Juraj Remenec
- Lecture Slovaks at CERN 2011, University of Žilina, October 12, 2011, young Slovak employees from CERN presented CERN as attractive employer for Slovak technical students and engineers. Organizer: Ivan Melo
- 19<sup>th</sup> International symposium EURNEX - Žel 2011 “New challenges for European railways”, 8<sup>th</sup> – 9<sup>th</sup> June 2011, Žilina, SR (organising committee chairman: Karol Rástočný, organising committee member: Peter Nagy)
- Workshop Concretization of cooperation form based on frame contract SkyToll – UoŽ, 8<sup>th</sup> February 2011, University of Žilina (coordinator: Rastislav Pirník)
- Excursion for 1<sup>st</sup> class MSc. degree students of Process control study programme at the railway station Vrútky – freight st. (electromech. interlocking device, mechanized hump yard), 10<sup>th</sup> May 2011 (Peter Nagy)
- Excursion for 2<sup>nd</sup> class MSc. degree students of Process control study programme at the railway stations Krásno nad Kysucou and Čadca – electronic interlocking devices Siemens SIMIS W, AŽD ESA 33 and Bombardier Ebilock 950, 26<sup>th</sup> November 2011 (Peter Nagy)
- Excursion for 2<sup>nd</sup> class MSc. degree students of Process control study programme at the railway station Vrútky – relay interlocking device with digital selection, 5<sup>th</sup> December 2011 (Peter Nagy)
- Excursion for 2<sup>nd</sup> class MSc. degree students of Process control study programme at the Traffic control centre of Czech Railways in Přerov – control system AŽD DOZ 1, 9<sup>th</sup> December 2011 (Peter Nagy)
- DIGITAL TECHNOLOGIES 2011 (DT'11), November 11-12, 2011, University of Žilina, Administrators: Branch of Slovak Electrotechnical Society (DTM UZ) and Faculty of Management Science and Informatics, University of Žilina, and others....
- Special Session on User Adaptive Systems for mobile Wireless Systems at ACIIDS 2011, The 3rd Asian Conference on Intelligent Information and Database Systems, April 20-22, 2011 Daegu, Korea. Lecture Notes in Artificial Intelligence, LNCS Vol.



- 6592/2011. (Eds.). Springer-Verlag, Berlin, Heidelberg. ISSN 0302-9743, ISBN 978-3-642-20042-7, Vice-chairman: Peter Brída
- Hudec, R. and team: Seminar „Research as a stimulus of education in secondary schools”, within POPULAS project, Žilina, December 9, 2011
  - Excursion for the 2<sup>nd</sup> class Bc Degree students at the Alcatel-Lucent Slovakia centre in Liptovský Hrádok, April 28, 2011 (Jarmila Müllerová)
  - Doors Open Day, the Satellite Workplace of the Faculty of Electrical Engineering in Liptovský Mikuláš, January 21, 2011 ( Zdislav Exnar, Stanislav Jurečka)
  - International Conference ALER 2011 „Alternative Energy Resources “, Liptovský Ján (in cooperation with the Slovak Society for Electrical Engineering, Liptovský Mikuláš), October 6-7, 2011.
  - Students Scientific-professional Competition, Satellite Workplace of the Faculty of Electrical Engineering in Liptovský Mikuláš, April 7, 2011.

### Publication activities

The permanent task of the Faculty is to increase the publication activity in quality journals which are indexed in international occupation databases.

Year	Monographs and university textbooks	Scientific works in journals	Scientific publications in Conference pub.	Patents	Others (Scripts, aso.)
2002	4	43 (3*)	130		34
2003	5	72 (6*)	143		4
2004	10	77 (11*)	219		20
2005	6	84 (10*)	247		28
2006	11	90 (10*)	201	4	12
2007	20	92 (13*)	257	1	25
2008	8	126 (8*)	196		69
2009	4	89 (11*)	231	1	29
2010	4	76(12*)	246	3	49
2011	4	86 (13*)	219	2	70

\* out of which also indexed in Current Contents Connect database

Tab.14 Publication activities at the Faculty of Electrical Engineering

### List of the most distinguished publications, which are in the Current Contents Connect database

Knociková, J.: **Time-Frequency Energy Distribution of Phrenic Nerve Discharges During Aspiration Reflex, Cough and Quiet Inspiration**, Computer Methods and Programs in Biomedicine, Vol. 102, No.1 (2011), s. 81-90, Issn 0169-2607

Pudiš, D., Šušlik, Ľ, Škriniarová, J., Kováč, J., Martinček, I., Kováč, J. JR, Haščik, Š., Kubicová, I., Veselý, M.: **Light extraction from a light emitting diode with photonic structure in the surface layer investigated by NSOM**, Optics&Laser Technology, Elsevier Ltd. (JOLT), Vol.43, No. 5, (2011) 917-921, ISSN 0030-3992

Martinček, I., Pudiš, D., Káčik, D., Schuster, K.: **Investigation of intermodal interference of LP<sub>01</sub> and LP<sub>11</sub> modes in the liquid-core optical fiber for temperature measurements**, Optik Vol.122, iss. 8, (2011) 707-710, ISSN 0030-4026

Piyadin, S.M., Gurchin, Y., Kurlkin, P. K., Terekhin, A.A., Glagolev, V.V., Isupov, A.Y., Itoh, K., Janek, M., Karachuk, J. T.: **Experimets on the study of deuteron-proton interaction at internal target at nuslotron**, International Journal of Modern Physicsts A, Vol. 26, nos. 3-4, (2011), s. 683-685, ISSN 0217-751X

Gintner, M., Juráň, J., Melo, I.: **Top-BESS model and its phenomenology**, Physical Review D, Vol. 84, no.3, (2011), ISSN 056-2821, s. 035013-1-030013-22

Mereš, M., Melo, I., Tomášik, B., Balek, V., Černý, V.: **Generating heavy particles with energy and momentum conservation**, Computer Physics Communications Vol. 182, no. 12 (2011), pp. 2561-2566, ISSN 0010-4655

Tomášik, B., Melo, I., Gintner, M.: **Non-equilibrium hadronisation and event-by-event fluctuations of rapidity distributions**, Indian J. Phys. Vol. 85, No. 7, (2011) pp. 1097-1101, ISSN 0973-1458

Martinček, I., Pudiš, D.: **Variable Liquid-Core Fiber Optical Attenuator Based on Thermo-Optical Effect**, Journal of lightwave technology, Vol. 29, No. 17, sept. 1, (2011) pp. 2647-2650, ISSN 0733-8724

Janek, M. at all.: **The 270MeV deuteron beam polarimeter at the Nuclotron Internal Target Station**, Nuclear Instruments and Methods in Physics Research A., Vol. 642, No. 1, (2011) s. 45-51, ISSN 0168-9002

Hockicko, P., Bury, P., Sidor, P., Kobayashi, H., Takahashi, M., Yanase, T.: **Analysis of A-DLTS spectra of MOS structures with thin NAOS SiO<sub>2</sub> layers**, Central European Journal of Physics. - ISSN 1895-1082. - Vol. 9, no. 1 (2011), s. 242-249

Počta, P., Holub, J.: **Predicting the quality of synthesized and natural speech impaired by packet loss and coding using PESQ and P.563 models**. In: Acta acustica united with acustica. ISSN 610-1928. Vol. 97, No. 5 (2011), s. 852-868 (ADC)

Jurečka, S., Kobayashi, H., Kim, W.-B., Takahashi, M., Pinčík, E.: **Study of density of interface states in MOS structure with ultrathin NAOS oxide**, In: Centr. Eur. J. Phys., Vol. 10, 2012, ISSN 1895-1082, No. 1, p. 210 – 217

Müllerová, J., Fischer, M., Netrvalová, M., Zeman, M., Šutta, P.: **Influence of deposition temperature on amorphous structure of PECVD deposited a-Si:H thin films**. In: Centr. Eur. J. Phys., Vol.9, 2011, ISSN 1895-1082, No.5., p. 1301 – 1308

#### **Authorship certificates, utility models, patents, discoveries**

Turek, I., Káčik, D.: Patent document number 287543 – **A method to measure polarization dispersion of optic fibres using low frequency interference**

Špánik, P., Palček, P., Pavlanin, R., Radvan, R.: Certificate about enrollment of Industrial Design No 5971 based on PÚV 20-2011 with the title „**Apparatus for Gigacycles Fatigue testing of materials**“ issued by: Industrial Property Office of the Slovak Republic in Banská Bystrica, 26<sup>th</sup> October 2011

Exnar, Z., Lakota, B.: **Predictive Digital Position Sensor**. Granted by the Industrial Property Office of the Slovak Republic, 2011, No. P 287617

Schwartz, L., Hottmar, V.: **Involvement of end-user boxes of interactive TV cable distribution**. P287679 (AGJ)

### Awards

“Exceptional Study Award” awarded by the Scientific Committee of the international scientific conference Trends in Biomedical Engineering 2011 for the presentation of a contribution entitled ***Cerevisiae growth regulation via exogenous low frequency electromagnetic fields: Ján Barabáš***

“Exceptional Study Award” awarded by the Scientific Committee of the international scientific conference Trends in Biomedical Engineering 2011 for the presentation of a contribution entitled ***Possibility of cells bioelectric properties evaluation using eddy currents: Roman Radil***

“Diploma” awarded by the Program Committee of the 15<sup>th</sup> International Student Conference on Electrical Engineering POSTER 2011 for the work ***Proliferative response of two different Saccharomyces Cerevisiae strands to extremely low frequency electromagnetic fields: Ján Barabáš***

“First Place Award” gained at the PhD. level of the Student Scientific Competition, Faculty of Electrical Engineering, University of Žilina: **Ján Barabáš**

**Dado Milan, Janota Aleš, Spalek Juraj:** Silver medal for long-term cooperation granted by the president of ELTODO Prague company Msc. Libor Hájek 21<sup>st</sup> November 2011 on the occasion of 20<sup>th</sup> anniversary of company

**Spalek Juraj:** Thankful letter from the director of strategy section of Ministry of Transport of Czech republic Luděk Sosna, PhD. Nr. 19/2011-520-TPV/2 from 27<sup>th</sup> January 2011 for long-term opponent work of research projects within the research programme „Support of realisation of a sustainable transportation development “.

**Spalek Juraj:** Thankful letter from the director of Research and development support agency of Ministry of Education SR (APVV) for a successful cooperation in year 2011. Bratislava

**Dušan Korček:** Award for the excellent presentation of the contribution ***Wavelength allocation for future coexistence XGPON***. 13th Conference of Doctoral Students ELITECH 2011, 17 May 2011, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava. Session No. 7 - Telecommunication

### Habilitation and Inauguration

Year	Habilitation		Inauguration	
	Internal	External	Internal	External
2004	2	1		
2005	1	1	3	
2006	2	2	2	
2007	6	2	1	1
2008	2	5		3
2009			1	1
2010	1		2	
2011	3		2	

Tab. 15 Number of habilitations and inaugurations in the last eight years

## 4 Foreign activities

Foreign activities at the FEE in 2011 include performance of accepted international projects, active participation in foreign scientific and technical undertakings, and mutual visits of teachers, researchers and students at foreign institutions.

Dean's office gets information from various agencies and institutions about offered study stays, government scholarships, summer schools, excursions, work places, foundations and so on. This information is published on notice boards of the Faculty and distributed to individual workplaces. Except that, all important information is sent by means of contact persons for foreign affairs at the Departments (DME – Assoc. Prof. M. Hrianka, DPES – Prof. J. Altus, DPh – Assoc. Prof. I. Jamnický, DCIS – Assoc. Prof. L. Muzikářová, DTaM – P. Brída, PhD., DEBE – B. Babušiak, PhD., DMAEE – Assoc. Prof. D. Faktorová, Satellite workplace in Liptovský Mikuláš – Assoc. Prof. J. Müllerová). They should find the best way how to inform their colleagues about offered opportunities of foreign co-operation and so to achieve directness of distributed information.

### *Programmes supporting educational activities*

#### **Program LLP/ERASMUS**

Within the frame of LLP/Erasmus programme **44 bilateral agreements** were approved for student's study stays and the teacher's and other staff's exchanges for the academic year 2010/2011, as follows:

TU Wien (AT), Technikum Wien (AT), Faculté Polytechnique de Mons (BE), College of Telecommunications and Post (BG), Todor Kableshkov Higher School of Transport (BG), Vysoké učení technické v Brne (CZ), Technická univerzita v Liberci (CZ), VŠB-Technická univerzita Ostrava (CZ), Západočeská univerzita v Plzni (CZ), Aalborg University (DK), RWTH Aachen (DE), TU Dresden (DE), Hochschule für Technik und Wirtschaft Dresden (DE), TU Darmstadt (DE), Universität Dortmund (DE), TU Braunschweig (DE), RUHR Bochum (DE); Hochschule Mittweida (DE), Universität Autonoma de Barcelona (ES), Universidad de Cantabria (ES), Helsinki University of Technology (FIN), Lappeenranta University of Technology (FIN), Tampere University of Technology (FIN), Université de Technologie de Compiègne (FR), Université de Picardie "JulesVerne" (FR), Université de Bordeaux 1 (FR), University of Patras (GR), Hellenic Open University (GR), National University of Ireland (IE), Università degli studi di Catania (IT), Transport and Telecommunication Institute (LV), Politechnika Lubelska (PL), Politechnika Radomska (PL), Politechnika Czesochowska (PL), West Pomeranian University of Technology (PL), Politechnika Gdanska (PL), Universidade do Porto (PT), Transilvania University of Brasov (RO), University of Linköping (S), Uludağ University (TR), Ankara University (TR), Zonguldak Karaelmas University (TR), University of East London (UK), University of Nottingham (UK).

For the academic year 2011/2012 **40 bilateral agreements** have been approved with the following universities:

TU Wien (AT), Faculté Polytechnique de Mons (BE), College of Telecommunications and Post (BG), Todor Kableshkov Higher School of Transport (BG), Vysoké učení technické v Brne (CZ), Technická univerzita v Liberci (CZ), VŠB-Technická univerzita Ostrava (CZ), Západočeská univerzita v Plzni (CZ), Aalborg University (DK), RWTH Aachen (DE), TU Dresden (DE), Hochschule für Technik und Wirtschaft Dresden (DE), TU Braunschweig (DE), RUHR Bochum (DE); Hochschule Mittweida (DE), Universitat Autonoma de Barcelona (ES), Universidad de Cantabria (ES), Aalto University (FIN), Lappeenranta University of Technology (FIN), Tampere University of Technology (FIN), Université de Technologie de

Compiègne (FR), Université de Picardie "JulesVerne" (FR), Université de Bordeaux 1 (FR), University of Patras (GR), Hellenic Open University (GR), National University of Ireland (IE), Università degli studi di Catania (IT), Transport and Telecommunication Institute (LV), Politechnika Radomska (PL), Politechnika Czestochowska (PL), West Pomeranian University of Technology (PL), Politechnika Gdanska (PL), Universidade do Porto (PT), Transilvania University of Brasov (RO), University of Linköping (S), Uludağ University (TR), Ankara University (TR), Istanbul Arel University (TR), Zonguldag Karaelmas University (TR), University of Nottingham (UK).

### **LLP/Erasmus stays**

Within the LLP/Erasmus programme 13 students (thence two in Erasmus practical placement), 8 Doctoral students (thence one in Erasmus practical placement), 18 teachers and 2 administrative staff participated in Erasmus programme in the academic year 2010/2011. The Faculty accepted 6 foreign students and 7 teachers and 1 administrative staff.

For the academic year 2011/2012 total of 16 study stays of students (thence 8 Doctoral students), 2 practical placements of students, 19 mobilities of teachers and 2 administrative staff mobilities have been planned. The Faculty accepted 4 foreign students in the winter semester of academic year 2011/2012 and will accept 1 foreign student in the summer semester.

### **Stays within the National scholarship programme of the Slovak Republic**

In the academic year 2010/2011 the Faculty accepted within the National scholarship programme of the SR 1 Doctoral student from Technical University of Ostrava.

In the academic year 2011/2012 the Faculty accepted within the National scholarship programme of the SR 3 following scholars: Master student from Moscow Technical University of Communication and Informatics, RU, Doctoral student from Politechnika Gdanska, PL and teacher for scientific research from Moscow Power Engineering Institute, RU.

### **Projects of International Programmes**

#### **7<sup>th</sup> Framework Programme projects**

*Title: 244749 European Science and Technology in Action Building Links with Industry, Schools and Home (ESTABLISH)*

Coordinator: Eilish McLoughlin (Dublin City University)

Co-operator: Ivo Čáp

#### **Erasmus projects**

*Title: 502784-LLP-1-2009-1-BE-ERASMUS-EMHE Shaping Inclusive and responsive University Strategies – Project SIRUS. EUA Project implemented under Lifelong Learning Programme of the European Union (2009-2011)*

Coordinator: Michael Hörig (EUA)

Co-operator: Michal Pokorný

*Title: 155980-LLP-1-2009-1-IT-ERASMUS-ENWA Academic Network EUGEN – European and Global Engineering Education*

Coordinator: Claudio Borri (Università degli Studi di Firenze, Italy)

Co-operator: Michal Pokorný

**COST projects**

*Title: Action TD1001: Novel and Reliable Optical Fibre Sensor Systems for Future Security and Safety Applications (OFSeSa)*

National Coordinator: Daniel Káčik

Co-operators: Ivan Martinček, Dušan Pudiš, Norbert Tarjányi, Peter Tvarožek, Ľuboš Šušlik, Ivana Kubicová

*Title: Project of European physical society International Physics Masterclasses 2011 (<http://wyp.teilchenphysik.org/mc.htm>)*

National Coordinator: Ivan Melo

Co-operators: Mikuláš Gintner, Gabriela Tarjányiová, Beáta Trpišová, Jozef Kúdelčík, Ivana Kubicová, Marián Janek

*Title: Action MP0702 Towards Functional Sub-Wavelength Photonic Structures*

Co-operators: Jarmila Müllerová, Eliška Jurisová

**CEEPUS II Projects**

*Title: From preparation to development, implementation and utilisation of joint programs in study area of Production Engineering – contribution to higher flexibility and mobility of students in central European region (CII-SK-0030-06-1011)*

Coordinator: Ivan Kuric

Co-operator: Fedor Kállay

**Other international projects**

*Title: Analysis of heat fields in power electronic systems (P-103-0007/08)*

Customer: Panasonic Electronic Devices Europe GmbH

Coordinator: Pavol Špánik

Co-operators: Jozef Čuntala, Branislav Dobrucký, Jozef Lakatoš, Libor Hargaš, Michal Frivaldský, Peter Drgoňa, Roman Radvan

*Title: Safety appraisal of track safety device EAH-08 (Co-operation agreement on research activity Nr. 1/2010 between SignalBau Přerov and University of Žilina)*

Coordinator: Karol Rástočný

Co-operators: Peter Nagy, Juraj Ždánsky, Juraj Ilavský

*Title: A-0930-RT-GC Helicopter fuselage Crack monitoring and prognosis through on-board sensor network (HECTOR)*

Coordinator: Róbert Hudec

Co-operators: Vladimír Wieser, Vladimír Hottmar, Miroslav Benčo, Michal Kuba, Martin Vestenický, Jozef Dubovan, Martina Zachariášová, Štefan Pollák, Martin Hric, Peter Vestenický, Ivo Čáp, Ladislav Janoušek, Milan Smetana, Pavol Rafajdus, Pavol Makyš, Vladimír Vavrúš, Matej Pácha

*Title: ETSI STF 436 on Adaption of the ETSI QoS Model to better consider results from field testing*

Co-operator: Peter Počta

*Title: COST IC 1003 European Network on Quality of Experience in Multimedia Systems and Services (QUALINET)*

National representatives: Roman Jarina, Peter Počta

*Title: Materials and Components for Environmental Protection (1M06031, Ministry of Education, Youth and Sports, Czech Republic)*

Coordinator: Pavel Šutta (Uni. of West Bohemia, New Technologies – Research Centre, Plzeň, CZ)

Co-operator: Jarmila Müllerová

*Note: In some cases as a contact persons are stated coordinators from the FEE UZ, even though the main coordinators are researchers from other institutions.*

### **Other activities**

The Faculty of Electrical Engineering cooperates within the co-operation agreements with the following institutions:

1. Faculty of Transport Sciences, Czech Technical University in Prague (CZ)
2. ELTODO EG, Prague (CZ)
3. ELTODO transport systems, Prague (CZ)
4. University of Pécs, Pollack Mihály Faculty of Engineering, Pécs (H)
5. Belarusian State University of Informatics and Radioelectronics (BY)
6. Università degli Studi di Catania (IT)
7. Yeungjin College, Korea
8. Universidad Nacional Autónoma de México (MX)
9. Politechnika Radomska (PL)
10. Politechnika Częstochowska (PL)
11. Politechnika Lubelska (PL)
12. Technical University of Ostrava (CZ)
13. University of West Bohemia, Pilsen (CZ)

Purpose of these agreements is to develop an exchange and co-operation in the field of education and research. The co-operation programme involves the following activities:

- Exchange of students
- Exchange of faculty members and staff
- Exchange of scientific materials, publications and information
- Joint research and research meetings
- Co-operation within the PhD. study (mainly with Catania).

### **Membership in international organizations/committees**

Peter Bury

- Chairman of the National IUPAP Committee (International Union for Pure and Applied Physics)

Daniel Káčik

- National coordinator COST TD 1001
- Member of the local Organizing Committee of the Conference of the Slovak and Czech Physicists

Ivan Melo

- National coordinator of the international project Masterclasses in Particle Physics
- Slovak delegate in the IPPOG (International Particle Physics Outreach Group)
- Slovak delegate in EPPCN (European Particle Physics Communication Network)

Peter Hockicko

- Member of SEFI (European Society for Engineering Education), PWG (Working Group on Physics), Slovak delegate
- Member of the Organizing Committee of PTEE 2011, 7. International Conference on Physics Teaching in Engineering Education

Branislav Dobrucký

- Member of IEEE IE Society
- Member of International Association for Science and Technological Development (IASTED), CA
- Reviewer for Publishing Company Elsevier, NL
- Reviewer for EPE journal, Brussels, BE
- Steering Programme Committee of International MIC IASTED 2007-2011 Conference
- Steering Programme Committee of International WMC 2011 Conference, Orlando, USA

Pavel Pavlásek

- Member of the Editorial Board of the *Strojárstvo* (Machinery) Journal
- Member of the Editorial Board of the *Inžinierske stavby* Journal
- Member of Brandon Hall Excellence in Learning Technology Awards
- Expert of FP7 Programme NMP – 2007 – 3.4 – 1
- Expert of Romanian Ministry of Education, Research and Youth, Romania

Pavol Špánik

- Member of IEEE IE Society
- Member of the Scientific Board of FEI – TU Ostrava, CZ
- Member of the Electronics Committee, FEI – TU Ostrava, CZ

Michal Frivaldský

- Member of IEEE IE Society

Peter Drgoňa

- Member of IEEE IE Society

Jozef Kandráč

- Student member of IEEE IE Society

Peter Hurtuk

- Student member of IEEE IE Society

Martin Priečinský

- Student member of IEEE IE Society

Dagmar Faktorová

- Member of IEEE, New York, USA
- Programme Committee of the Conference EDS, Brno, CZ
- Technical Committee of the Conference ENDE 2011, Chennai, India

Milan Šimko

- International Journal for Traffic and Transport Engineering (IJTTE), Beograd, Serbia – member of draft committee
- Journal ETM, Czech Republic – member of draft committee

Milan Chupáč

- Journal ETM, Czech Republic – member of draft committee

Mária Franeková

- Member of Programme Committee of 11<sup>th</sup> International conference *Transport Systems Telematics TST'11*, Katowice-Ustroń, Poland : 19<sup>th</sup> – 22<sup>nd</sup> October 2011
- Member of Editorial Board of International scientific magazine *Advanced in Electrical and Electronic Engineering*, Poland, ISSN 1804-3119
- Member of Editorial Board of International scientific magazine *Archives of Transport System Telematics*, CR, ISSN 189-8208



## Aleš Janota

- Member of DC TUD COST – Domain for Transport and Urban Development – European Cooperation in Science and Technology, Brussels
- Member of Programme Committee of 11<sup>th</sup> International conference *Transport Systems Telematics TST'11*, Katowice-Ustroń, Poland : 19<sup>th</sup> – 22<sup>nd</sup> October 2011
- Member of Programme Committee 9<sup>th</sup> International Navigational Symposium on Marine Navigation and Safety of Sea Transportation Trans-Nav 2011, Gdynia, Poland: 15<sup>th</sup> 17<sup>th</sup> June 2011
- Member of Programme Committee 15<sup>th</sup> international conference “Computer Aided Science, Industry and Transport” TRANSCOMP 2011, Zakopané, Poland: 5<sup>th</sup> – 8<sup>th</sup> December 2011
- Chairman of the Editorial Board of international scientific magazine *Archives of Transport System Telematics*, Poland ISSN 1899-8208
- Member of Scientific Board of Faculty of Transport and Electrotechnics, Politechnika Radomska, Radom, Poland
- Member of ACM – Association for Computing Machinery, USA
- member of International Institute of Informatics and Systemics, USA

## Karol Rástočný

- Member of Programme Committee of 11<sup>th</sup> International conference *Transport Systems Telematics TST'11*, Katowice-Ustroń, Poland : 19<sup>th</sup> – 22<sup>nd</sup> October 2011
- Member of Programme Committee of 9<sup>th</sup> International conference *IEEE Applied Electronics*, Pilsen, CR: 7<sup>th</sup> – 8<sup>th</sup> September 2011
- Member of Editorial Board of international scientific magazine *Transport Problems*, ISSN 1896-0596
- Member of Editorial Board of international scientific magazine *Archives of Transport System Telematics*, ISSN 1899-8208
- Member of Editorial Board of international scientific magazine *Advanced in Electrical and Electronic Engineering*, Poland, ISSN 1804-3119

## Juraj Spalek

- vice chief editor of *Annals of Faculty Engineering Hunedoara – Journal of engineering scientific magazine*, ISSN 1584-2665; Index COPERNICUS – Journal Master List, available on the internet <<http://journals.indexcopernicus.com>>, Genamics JournalSeek database, available on the internet <<http://journalseek.net/>>, <http://annals.fih.upt.ro/associateeditors.html>
- member of Scientific Board *ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering*, e-ISSN: 2067-3809, Edited by Faculty of Engineering Hunedoara University Politehnica Timisoara, <http://acta.fih.upt.ro/bibliographic-info.html>
- member of Programme Committee of international scientific magazine *Archives of Transport System Telematics*, Polish Association of Transport Telematics, ISSN 1899-8208
- member of Programme Committee of 11<sup>th</sup> International conference *Transport Systems Telematics TST'11*, Katowice-Ustroń, Poland : 19<sup>th</sup> – 22<sup>nd</sup> October 2011
- member of appraisal team of symposium and multiconference The 8<sup>th</sup> International Symposium on Risk Management and Cyber-Informatics: RMCI 2011 In the Context of The 15th Multi-conference on Systemics, Cybernetics and Informatics: WMSCI 2011 July 19 - 22, 2011, Orlando, Florida, USA

## Peter Brída

- ICST (Institute for Computer Sciences, Social Informatics and Telecommunications Engineering), Gent, Belgium
- Scientific Committee member of Conference on Knowledge in Telecommunication and Optics, Szczyrk, Poland
- Member of IEEE, USA

## Milan Dado

- Member of IEEE, USA

- Member of SPIE, USA
- National coordinator of COST and member of CSO COST
- Chair of the International sec. of the editorial Board – Journal Advances in Electrical and Electronic Engineering, Ostrava

Ivan Dolnák

- Member of IEEE, USA

Roman Jarina

- National representative and MC member of COST IC 1003
- Member of IEEE, USA
- Member of IET, UK
- Member of AES, USA

Daša Tichá

- Member of IEEE, USA
- Member of Radioengineering, Prague

Peter Počta

- Member of Speech Transmission Quality working group (ETSI), Sophia-Antipolis
- Member of Management Committee ETSI STF 392
- Member of Study Group 12 at ITU-T, Geneva
- Member of Scientific Committee of international conference on Knowledge in Telecommunication and Optics, Ostrava
- Member of Scientific Committee of International Conference MESAQIN
- National representative and MC member of COST IC 1003

Darina Jarinová

- Member of IEEE, USA

Martin Vaculík

- Member of Scientific Committee of International conference RTT 2011
- Member of Scientific Committee of International conference on Knowledge in Telecommunication and Optics, Ostrava
- Member of Scientific Committee of conference PRIZMA
- Editorial Board member of journal Advances in Electrical and Electronic Engineering, Ostrava

Vladimír Wieser

- Editorial Board member of Journal Radioengineering, CZ

Klára Čápková

- International Society COMPUMAG, Southampton, UK
- Editorial Board of the international scientific journal Advances in Electrical and Electronic Engineering, ISSN 1804-3119, Ostrava, CZ
- Scientific Committee of the international scientific conference Trends in Biomedical Engineering, 2011, Rožnov pod Radhoštěm, CZ
- Scientific Committee of the international scientific conference Advanced Methods of the Theory of Electrical Engineering, 2011, Klatovy, CZ

Ivo Čáp

- Scientific Board of the Pedagogical Faculty, University of Hradec Králové, Hradec Králové, CZ
- Branch Committee for PhD. study field “Theory of Education of Physics”, Pedagogical Faculty, University of Hradec Králové, CZ
- Branch Committee for PhD. study field “Theory of Education of Physics”, Faculty of Science, University of Ostrava, CZ
- Editorial Board of the journal Československý časopis pro fyziku, Academy of Sciences of CR, Prague, CZ
- Editorial Board of the journal ARNICA, University of West Bohemia, Plzeň, CZ
- Independent expert of EC – DG R&D, evaluation of projects under FP7 – Marie Currie, 10<sup>th</sup>-16<sup>th</sup> April 2011, Brussels, Belgium

- International Board of the EUSO (European Union Science Olympiad), Dublin, Ireland
- International Board of the IPhO 2011 (International Physics Olympiad), Bangkok, Thailand
- Scientific Committee of the international scientific conference Trends in Biomedical Engineering, 2011, Rožnov pod Radhoštěm, CZ
- Program Committee of conference Modern Trends in Preparation of Physics' Teachers 5 – Teaching of Physics in the Context of Requisites of Modern Society, 2011, Plzeň, CZ

Ladislav Janoušek

- Japanese Society for Non-Destructive Inspection, Tokyo, Japan
- Program Committee of the 7th Framework Programme – Regions of Knowledge, Research Potential, Brussels, Belgium

Juraj Altus

- Representative of University of Žilina, CIRED, CZ
- Representative of SK in International Energetic Agency IEA, Paris, F
- Member of IEEE
- Member of International scientific committee of EPE 2011, Brno, CZ

Valéria Hrabovcová

- Senior member of the IEEE
- Head of professional group of IEEE IAS/IES CS

Ján Vittek

- Member of program committee of conferences IASTED,

Jiří Drábek

- Representative of Slovakia in committees: IEC/TC9 Electric Railways Equipment, CENELEC/TC9X Electrical and Electronic Applications for Railways

Alena Otčenášová

- Member of International scientific committee of conference EPE 2011, Brno, CZ
- Member of IEEE

Milan Pospíšil

- Vice-chairman of the committee for PHD thesis defence in the scientific field of Energetics, FEI VŠB TU Ostrava, CZ

Pavol Rafajdus

- Member of IEEE
- Member of International committee of conference Low Voltage Electrical Machines,

Peter Bracíník

- Member of IEEE

Matěj Pácha

- Member of IEEE, IAS/IES Joint Chapter Treasurer
- Member of expert group Research and development CZ LOKO, Česká Třebová, CZ

Jarmila Müllerová

- Member of the programme committee of the International Conference Information Photonics 2011, 18 – 20 May 2011, Ottawa, Canada

Stanislav Jurečka

- Member of American Nano Society

Milan Gottstein

- Member of NATO C3 Council (Command, Control, Communication),

Zdeněk Dostál

- Member of the Programme Committee of the International conference NZEE 2011, VUT Brno
- Member of the Scientific Committee of the International conference RESpect 2011, Faculty BERG, TU Košice.

**Foreign stays, visits and conferences**

Employees and doctoral students of the Faculty performed in 2011 several short or long stays in foreign countries at partner universities or institutions, and on the contrary, the FEE and its departments accepted students and teachers from abroad.

List of people who arrived to the FEE or departed from the FEE within foreign stays, conferences and visits can be seen in Table 16, distributed according to countries and departments.

<b>IN/OUT</b>	<b>DPh</b>	<b>DMAEE</b>	<b>DEBE</b>	<b>DME</b>	<b>DPES</b>	<b>DCIS</b>	<b>DTM</b>	<b>DEF</b>	<b>DEEE</b>	<b>FEE</b>
Austria	0/1					0/3	1/2			
Belgium			0/4				0/5	1/0		
Byelorussia							0/1			
Canada								1/0		
China					3/1					
Croatia				0/1						
Czech Rep.	2/1	0/3	1/17	0/18	1/4	4/7	1/7	4/1	2/2	
Finland	0/1			0/1						
France				0/1			3/0			
Germany	0/2		1/6	1/2		1/5	5/1			
Greece				1/1	0/2		0/1			0/1
Hungary						1/1	0/3			
India		0/1	0/4							
Ireland	0/1						6/2			
Italy		0/1	0/6	0/1	0/3		0/3			
Japan	1/0			3/0						
Leipzig							0/2			
Libya				1/0						
Macedonia						0/1				
Norway							1/0			
Poland	1/1	2/4	1/0	3/6	0/5	3/7	0/1		1/0	
Portugal		0/1			3/0					
Romania		2/1		1/0	3/4				1/0	
Russia							1/1			
Serbia					0/1					
South Korea							0/1			
Spain		0/1		0/1	1/0					1/1
Sweden					0/1			0/1		
Switzerland	0/1						2/2			
Thailand			0/2							
Turkey							1/2			
UAE							0/1			
UK					0/2					
USA				0/3	0/1		1/0			
<b>Total</b>	<b>4/8</b>	<b>4/12</b>	<b>3/39</b>	<b>10/35</b>	<b>11/24</b>	<b>9/24</b>	<b>22/35</b>	<b>6/2</b>	<b>4/2</b>	<b>1/2</b>
<b>Total all</b>	<b>74/183</b>									

Tab. 16 Foreign stays, conferences and visits in 2011

Table 16 contains also long stays of employees and doctoral students abroad, and long stay visits of foreign participants at the departments of the FEE.

Longer stays abroad can be seen in more detail in Table 17.

Department	Name	Country	Duration
DPh	Mikuláš Gintner	Czech Republic	22 days
	Peter Hockicko	Finland	5 days
	Ivan Melo	Switzerland	5 days
DMAEE	Dagmar Faktorová	India	9 days
	Dagmar Faktorová	Italy	6 days
	Dagmar Faktorová	Spain	5 days
	Dagmar Faktorová	Romania	7 days
	Ján Poliak	Poland	5 days
DEBE	Klára Čápková	Germany	7 days
	Klára Čápková	India	7 days
	Klára Čápková	Belgium	6 days
	Klára Čápková	Thailand	7 days
	Klára Čápková	Italy	6 days
	Ivo Čáp	Germany	7 days
	Ivo Čáp	Italy	6 days
	Ivo Čáp	Thailand	7 days
	Ivo Čáp	Belgium	6 days
	Ladislav Janoušek	India	7 days
	Ladislav Janoušek	Italy	9 days
	Ladislav Janoušek	Italy	6 days
	Milan Smetana	India	7 days
	Milan Smetana	Italy	6 days
	Tatiana Strapáčová	India	7 days
	Tatiana Strapáčová	Italy	6 days
	Mária Michniaková	Germany	3 months
	Mária Michniaková	Germany	2 months
DME	Miroslav Hrianka	Germany	7 days
	Branislav Dobrucký	France	6 days
	Branislav Dobrucký	Greece	5 days
	Branislav Dobrucký	Spain	6 days
	Pavol Špánik	Italy	10 days
	Pavol Špánik	USA	5 days
	Michal Frivaldský	USA	5 days
	Peter Drgoňa	USA	5 days
	Andrej Rybovič	Germany	6 months
	Martin Priečinský	Finland	4 months
DPES	Juraj Altus	UK	5 days
	Ján Vittek	China	12 days
	Pavol Rafajdus	Romania	5 days
	Peter Bracíník	Poland	14 days
	Peter Bracíník	UK	5 days
	Marek Höger	Czech Republic	10 days
	Pavol Makyš	Italy	5+5 days
	Matěj Pácha	Italy	10 days
	Matěj Pácha	USA	9 days
	Vladimír Vavrůš	Romania	5 days
	Vladimír Vavrůš	Italy	5 days
	Ján Faber	Sweden	4 months
	Lukáš Kalamen	Greece	5 days

	Lukáš Kalamen	Romania	5 days
	Peter Sekerák	Greece	5 days
	Peter Sekerák	Romania	5 days
	Ján Turček	Poland	14 days
DCIS	Karol Rástočný	Czech Republic	6 days
DTaM	Miroslav Benčo	Italy	12 days
	Peter Brída	Greece	5 days
	Peter Brída	Turkey	5 days
	Peter Brída	Hungary	5 days
	Róbert Hudec	Italy	8 days
	Peter Počta	Germany	5 days
	Peter Počta	Turkey	5 days
	Peter Počta	Czech Republic	8 days
	Peter Počta	Switzerland	5 days
	Peter Počta	Switzerland	5 days
	Peter Počta	Austria	5 days
		Martina Zachariášová	Italy

Tab. 17 Longer stays abroad in 2011 ( $\geq 5$  days)

Employees of the FEE published and/or took part in many international conferences, workshops and symposiums. Detailed information about particular names of employees, titles of papers and conferences, activities performed during study stays and purposes of foreign visits are presented in annual reports of departments of the FEE for the year 2011.

## 5 Main Tasks of the Faculty for the year 2012

The framing program of development of the Faculty for the period of years 2008-2013, which was actualized and specified at the Scientific Board of FEE on 12<sup>th</sup> October 2009, is being realized. The basic strategic aim is to build the Faculty as a prestigious educational and research institution with a prominent place among Slovak faculties, which has a significant international recognition in the most offered study programmes and fields of research and development.

### Fulfillment of main tasks for the year 2011

- The harmonization and innovation of curricula ran in the year 2011, the most fundamental changes took place in the reaccredited study programmes of the 1st and 2nd study degree.
- Numbers of newly admitted students copied the capacities of individual departments of the Faculty.
- In the evaluation of the quality of applicants for study at the University, the level in long-term can be found a stagnant.
- In order to help new students to navigate in the system of higher education and to prevent problems, several meetings were held between management of the Faculty and students of the 1st study degree.
- There were surveys of students views to current teaching in order to get feedback and eliminate deficiencies in the education process.
- In addition to Erasmus program, other types of grants were supported (mainly the National scholarship programme) in order to increase the mobility of both domestic and foreign students and teachers.
- There was substantial improvement of the technical and software equipment of the laboratories by projects of the structural funds.

- The management of the Faculty supported organizing of students' scientific and professional competition.
- Continued to help graduates to integrate into work process within the frame of Alumni Club.
- Favorable conditions (individual courses) for the study have been created for the study of students with disabilities.
- Continue to developed contacts with foreign higher education institutions.
- The state of performance of the accreditation parameters was regularly evaluated and analyzed.
- The annual evaluation of the Faculty, individual departments as well as staff took place.
- Continued upgrading of technical infrastructure, research and development in a total value of 907 626 € (financed by the structural funds).
- In publishing activities there were supported the quality international outputs and presentations of the results of work on relevant forums.
- Continued cooperation in the issue of the scientific journal Advances in Electrical and Electronic Engineering with foreign co-editor.
- Several proposals of research projects have been supported and submitted to national and international grant agencies (7.FP, APVV, VEGA, KEGA etc.).
- The emphasis was put on the optimization of the use of funds from the Faculty resources.
- At the Faculty level the English language courses were organized and supported with the aim to increase the level of language training of young researchers and PhD students.
- Management of the Faculty and the departments actively participated in meetings with the staff of related professional focus (FELAPO, meetings of departments with related focus).
- Representatives of the Faculty developed activities within the frame of international scientific and professional associations (IEEE, IFAC, IFIP, IET, SPIE, ACM and below).
- The staff of the Faculty organized or participated in organization of several conferences, symposiums and workshops (EURO-ŽEL, International Conference of railway notification and security technology in Vyhne).
- Regularly conducted evaluation of the qualification growth of the faculty staff.
- The personnel policy of the Faculty supported the stabilization and the involvement of young scientists.
- Quality management system and its functionality have been improved in closer links to assessment and performance of accreditation criteria in their full extent.
- HW and SW upgrade of faculty www server took place with subsequent extension of provided information and services inwards and outwards.
- The main source of financing of the FEE in 2011 were grants awarded under the Act No 303/1995 Collection of the law on financial regulation as amended as well as other financial resources obtained in accordance with the law on universities (domestic and foreign scientific and educational projects, structural funds, donations from domestic and foreign natural and legal persons, business activity).

### **Quantifiable main tasks for the year 2012**

- Ensure continuous transition agenda to the new management resulting from the elections in the year 2012.
- To organize international scientific conference ELEKTRO 2012 on the occasion 20<sup>th</sup> anniversary of the reestablishment of the Faculty (after the transitional period of merger with the Faculty of Mechanical Engineering).
- Participation in the organization of at least 5 other conferences/ seminars/ events.
- In accordance with the plans of the qualification growth to realize the habilitations of at least 5 and the inaugurations of at least 2 faculty employees.

- To organize at the Faculty level the English language course for young researchers and PhD students.
- To organize and promote ŠVOS competitions for all 3 study degrees.
- Meet the conditions of the quality management system for 2012.
- To monitor and at least once a year evaluate the ongoing evaluation of accreditation criteria.
- To participate in the annual meetings of the Faculties of electrical engineering and related focus (FELAPO 2012).
- Two times per year to evaluate the submitted project proposals to national and international funding agencies.
- To promote and ensure a mobility for at least 10 foreign lectures.
- Two times per year to convene a board meeting of the Faculty with PhD students and their trainers and meeting with academics of the Faculty.
- Within the marketing activities to implement at least 1 action directed to primary schools and 1 action directed to secondary schools.



## Attachment

## Contract-based Business Activities in 2011

No	Number of contract	Customer	Coordinator	Title
1.	P-103-0001/11	VÚD Žilina	Rastislav Pirník, DCIS	Analysis of methodical and technical conditions and design of new TP relevant with the NSDI project.
2.	P-103-0002/11	Stredoslovenská energetika, a.s. Žilina	Juraj Altus, DPES	Analysis of voltage and simultaneously current conditions at the given node Tr 110/22 kV Bytca
3.	P-103-0003/11	Rockwell Automation Slovakia, Bratislava	Juraj Ždánsky, DCIS	Educational training for KIA Motors Slovakia Ltd. On Control Logix and PVP system
4.	P-103-0005/11	Stredoslovenská energetika, a.s. Žilina	Juraj Altus, DPES	Analysis of voltage and simultaneously current conditions at the given node Tr 110/22 kV Rajec
5.	P-103-0006/11	AŽD Praha, Ltd., Prague	Karol Rástočný, DCIS	Appraisal of creation process of functional behaviour model of RBCC – analytic part
6.	P-103-0007/11	EuroEcology, s.r.o. Bratislava	Juraj Altus, DPES	Connectivity study for several organizations
7.	P-103-0008/11	SEPS, a.s. Bratislava	Juraj Altus, DPES	Submitted ZoD within quotation - <b>unrealized</b>
8.	P-103-0010/11	Rockwell Automation Slovakia, Bratislava	Juraj Ždánsky, DCIS	Educational training for KIA Motors Slovakia Ltd. On Control Logix and PVP system
9.	P-103-0011/11	LambdaControl, s.r.o. Lipt.Hrádok	Miroslav Gutten, DMAEE	Calibration DST in Rimavská Sobota - <b>unrealized</b>
10.	P-103-0013/11	Siemens AG, Vienna	Karol Rástočný, DCIS	Extension of existing overall appraisal for interlocking boxes in Slovakia (corrections of V44K100309R351 version of migration phase)
11.	P-103-0014/11	Tepláreň Považská Bystrica	Milan Chupáč, Milan Šimko, DMAEE	Thermovision measurement
12.	P-103-0007/08	Panasonic	Pavol Špánik, DME	Analysis of heat fields in power electronic systems

## Contacts and Address:

### Academic Officials:

Dean of the Faculty:

**Prof. Milan Dado, PhD.**  
phone: 041-513 2050  
e-mail: [dean@fel.uniza.sk](mailto:dean@fel.uniza.sk)

Vice-dean for Education:

**Prof. Michal Pokorný, PhD.**  
phone: 041-513 2057  
e-mail: [education.vicedean@fel.uniza.sk](mailto:education.vicedean@fel.uniza.sk)

Vice-dean for Development and International Co-operation:

**Prof. Aleš Janota, PhD.**  
phone: 041-513 2066  
e-mail: [international.vicedean@fel.uniza.sk](mailto:international.vicedean@fel.uniza.sk)

Vice-dean for Research:

**Assoc. Prof. Pavol Rafajdus, PhD.**  
phone: 041-513 2058  
e-mail: [research.vicedean@fel.uniza.sk](mailto:research.vicedean@fel.uniza.sk)

Secretary:

**MSc. Katarína Jurošková**  
phone: 041-513 20 52  
e-mail: [secretary@fel.uniza.sk](mailto:secretary@fel.uniza.sk)

Address:

Faculty of Electrical Engineering  
University of Žilina  
Univerzitná 1  
010 26 Žilina  
Slovak Republic

Phone: +421-41-513 2051

Fax: +421-41-513 1515

E-mail: [dean.office@fel.uniza.sk](mailto:dean.office@fel.uniza.sk) for dean's office

Visit our Internet site on <http://fel.uniza.sk/>

## DEPARTMENT OF PHYSICS

### 1 General Information

Advances in technical fields have always relied to a large degree on know-how and methods originating in Physics. Many phenomena and principles studied in Physics today become the basis of applications tomorrow, e.g. in quantum information science. It is therefore very important to provide the students of the technical fields with good basics of Mathematics and Physics.

The Department of Physics teaches General Physics to students of all faculties of the University and Advanced Physics for some special courses. The Department provides the students with the basic understanding of physics, trains them in applying the principles of physics to various engineering problems as well as gives the students a review of modern physics.

The Department is divided into two sections according to their research and educational specialisation. The staff consists of 1 Professor, 6 Associate Professors, 13 senior lecturers, 4 internal Ph.D. students, 4 research fellows and 3 technical/administrative workers who support the research and teaching activities of the Department.

The research carried out at the Department is mostly concerned with the utilization of acoustic and optical wave processes for the investigation of condensed matter. Acoustic Group exploits a wide range of acoustic methods and techniques as well as acoustoelectric and acoustooptic phenomena to investigate semiconductors, metals, ferroelectric materials and magnetic liquids. New acoustic techniques are also developed.

Optical group studies physical properties of the conventional telecommunications optic fibres and special fibres such as capillary fibres and photonic fibres. The group has extended its activities to include technologies of preparation and analysis of photonic structures for integrated optics and optoelectronics. The newest results are from the area of optofluidic waveguides where sensors and optic elements are being developed. Self-diffraction of light in magnetic fluids and photorefractive phenomenon in selected condensed matter materials are also studied within the group.

The theoretical high-energy physics group works in the area of strong electroweak symmetry breaking and quark-gluon plasma.

The research groups of the Department are also well known abroad. The scientific activities of the Department are regularly presented at the international conferences and are published in significant physical journals. The members of the staff also participate in various educational and scientific activities outside the Department and the University, especially as members of various scientific boards at both domestic and international institutions. There are also many activities focused on further education of high school and elementary school Physics teachers and their pupils and students, which is an important outreach work .

### 2 Staff of the Department

Head of the Department	: Peter Bury
Vice-head of the Department	: Dušan Pudiš
Secretary for Education	: Gabriela Tarjániová
Secretary for Research	: Daniel Káčik
Administrative Support	: Anna Chasníková
Technical Support	: Nadežda Remencová, František Černobila, Juraj Remenec (1/3)

## 2.1 Sections of the Department

### 2.1.1 Section of General Physics

Head of the Section	: Ivan Melo
Research Fellows	: Mikuláš Gintner, Ivan Melo
Senior Lecturers (with PhD)	: Beáta Trpišová, Gabriela Tarjányiová
Senior Lecturers (without PhD)	: Pavel Virdzek, Ivan Bellan, Juliana Knociková (until Jun 30, 2011), Ladislav Vikisály

### 2.1.2 Section of Applied Physics

Head of the Section	: Dušan Pudiš
Professor	: Peter Bury
Associate Professors	: Daniel Káčik, Ivan Martinček, Dušan Pudiš, Ctibor Musil (1/2), Sofia Slabeyciusová, Július Štelina (1/2)
Research Fellows	: Jozef Kúdelčík, Igor Jamnický
Senior Lecturers (with PhD)	: Jana Ďurišová (since 1.9.2011), Peter Hockicko, Norbert Tarjányi, Marián Janek, Peter Sidor, Ľuboš Šušlik (since 1.10.2011), Peter Tvarožek (1.10.-30.11.2011)

### 2.1.3 Postgraduate Students

Internal	: Jozef Drga, Ivana Kubicová, Ľuboš Šušlik (until 30.9.2011), Peter Tvarožek (until 30.9.2011)
External	: Juliana Knociková (until Jun 30, 2011), Pavel Virdzek (since 1.9.2011)

## 3 Teaching

### 3.1 Courses in Bachelor and Master Degree Programmes

Code	Title	Semester	Hours/week	Lessons-Seminars-Lab. exercises	Teachers
<i>Courses for the Faculty of Electrical Engineering</i>					
31110	Introduction to Physics	1	1 - 2 - 0		Káčik
31201	Physics I	2	3 - 2 - 1		Bury, Pudiš, Káčik
31303	Physics II	3	3 - 2 - 1		Bury, Pudiš
31450	Basics of Optoelectronics	4	2 - 1 - 0		Tarjányi
32109	Physics III	1	2 - 1 - 0		Pudiš
32315	Integrated Optics	3	2 - 2 - 0		Tarjányi
32321	Measurement in Telecommunications	4	3	0 - 0 - 2	Káčik
<i>Courses of the Faculty of Mechanical Engineering</i>					
2B018	Physics I	2	3 - 2 - 0		Martinček, Slabeyciusová
2B033	Physics II	3	2 - 0 - 2		Martinček, Slabeyciusová

2B018 Physics I (External studies)	2	20 - 6 - 0	Slabeyciusová
2B033 Physics II (External studies)	3	20 - 6 - 0	Slabeyciusová

*Courses of the Faculty of Civil Engineering*

4B113 Physics	1	2 - 1 - 1	Štelina, Kúdelčík
4B117 Seminar on Physics	1	0 - 2 - 0	Kúdelčík
4B218 Physics - optics	2	2 - 1 - 0	Štelina
4B202 Physics I	2	2 - 1 - 1	Hockicko, Jamnický
4B211 Chapters of Physics	2	0 - 2 - 0	Hockicko
4E203 Physics – (External studies)	2	12 - 8 - 0	Tarjányi
4E208 Chapters of Physics - (External studies)	2	10 - 0 - 0	Tarjányi

*Courses of the Faculty of Operation and Economics of Transport and Communication*

11P101 Physics	1	2 - 1 - 1	Jamnický, Hockicko
11P102 Physics	1	2 - 1 - 1	Hockicko
12P101 Physics (External studies)	1	8 - 4 - 4	Hockicko
12P102 Physics (External studies)	1	12 - 0 - 4	Hockicko
12P103 Physics (External studies)	1	16 - 0 - 0	Jamnický

*Courses of the Faculty of Management Science and Informatics*

5BF005	Fundamentals of Physics	1	3 - 1 - 1	Martinček
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*Courses of the Faculty of Special Engineering*

92026 Physics	2	2 - 1 - 1	Kúdelčík
97026 Physics	2	18 - 0 - 0	Trpišová

*Courses of the Faculty of Humanities*

8BT133 Planning and Evaluation of Experiment	4	2 - 1 - 1	Jamnický
8BT148 Computer Physics I	5	0 - 2 - 2	Kúdelčík
8BT151 Computer Physics II	6	1 - 0 - 2	Kúdelčík
8BT113 Physics I	2	3 - 2 - 1	Bury
8BT248 Physical acoustics	2	2 - 1 - 0	Bury
8BT129 Physics II	3	3 - 2 - 1	Bury
8BT208 Condensed matter Physics	1	3 - 2 - 0	Pudiš

**3.2 Courses in doctoral studies**Faculty of Civil Engineering

4D102 Applied Physics	1d	2 - 0 - 0	Bury
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## 4 Educational, Research and Scientific Projects

### 4.1 National Projects

#### 4.1.1 Research Projects Funded by the Scientific Grant Agency of the Slovak Republic (VEGA)

*Title: Design, fabrication and diagnostics of the microstructural optic fibres for sensoric and photonic applications (Grant VEGA 1/0683/10)*

Coordinator: Ivan Martinček  
 Sub-Coordinator: Dušan Pudiš  
 Co-operators: Daniel Káčik, Norbert Tarjányi, Peter Tvarožek, Ľuboš Šušlik  
 Sub-Coordinator for SAS: Emil Pinčík  
 Co-operators: Róbert Brunner, Jaroslav Rusnák

*Title: Influence of various nanoparticles on structural transitions in ferromagnetics and on dielectric properties of magnetic fluids (VEGA 2/0077/09).*

Coordinator: P. Kopčanský, IEP SAS Košice  
 Sub-Coordinator: Peter Bury  
 Co-operators: Jozef Kúdelčík

*Title: NSOM lithography and interference lithography as progressive methods for preparation of photonic structures and optoelectronic elements with photonic structure (VEGA 1/1058/11).*

Coordinator: Dušan Pudiš  
 Sub-Coordinator: Ivan Martinček  
 Co-operators: Daniel Káčik, Norbert Tarjányi, S. Slabeyciusová, Ľuboš Šušlik, Ivana Kubicová, Peter Tvarožek.

#### 4.1.2 Cultural and Educational Grant Agency KEGA

*Title: Development of Core Competences of Technical University Students in Physics Education (Grant KEGA 075-008ŽU-4/2010)*

Coordinator: Peter Hockicko  
 Co-operators: Peter Sidor, Dušan Pudiš, Gabriela Tarjányiová, Peter Bury, Igor Jamnický, Jozef Kúdelčík

*Title: Development of Scientific Literacy in University Preparation of Students of Pre-school and Elementary School Pedagogy (Grant KEGA 002KU-4/2011)*

Coordinator: Ivana Rochovská, KU Ružomberok  
 Co-operators: Peter Hockicko

#### 4.1.3 Research Projects Funded by the Slovak Research and Development Agency (APVV)

*Title: Revealing microworld mysteries through experimental data analysis (APVV LPP 0059-09)*

Coordinator: Alexander Dirner (UPJŠ Košice)  
 Sub-Coordinator: Ivan Melo  
 Co-operators: Mikuláš Gintner, Gabriela Tarjányiová, Beáta Trpišová, Jozef Kúdelčík, Juraj Remenec, Ivana Kubicová, Marián Janek

*Title: Ultrarelativistic Heavy-ion Collisions 2010-2011 (Grant APVV SK-PL-0021-09)*

Coordinator: Boris Tomasik, UMB Banska Bystrica  
Co-operator: Ivan Melo

*Title: Scouting and education of talents in physics by physics competitions on the elementary and secondary schools (Grant APVV LPP-0067-07)*

Coordinator: Ivo Čáp  
Co-operator: Jozef Kúdelčík

#### 4.1.4 Projects of European Structural Funds

*Title: Center of excellence for power electronics and their material components (26220120003)*

Coordinator Activities 4.1: Peter Bury  
Co-operators: Ivan Bellan, Peter Hockicko, Igor Jamnický, Daniel Káčik, Jozef Kúdelčík, Ivan Martinček, Dušan Pudiš, Norbert Tarjányi, František Černobila

*Title: Center of excellence for power electronics and their material components (26220120046)*

Coordinator Activities 2.1: Peter Bury  
Co-operators: Ivan Bellan, Peter Hockicko, Igor Jamnický, Daniel Káčik, Jozef Kúdelčík, Ivan Martinček, Dušan Pudiš, Norbert Tarjányi, František Černobila

*Title: Investigation of very economic components of electric driving systems of railway vehicles and vehicles used for public transport (26220220078)*

Co-operator: Igor Jamnický

## 4.2 International Projects

### 4.2.1 COST Projects

*Title: Novel and Reliable Optical Fibre Sensor Systems for Future Security and Safety Applications (OFSeSa) (Action TD1001)*

National Coordinator: Daniel Káčik  
Co-operators: Martinček Ivan, Pudiš Dušan, Tarjányi Norbert, Peter Tvarožek, Šušlik Ľuboš, Kubicová Ivana

### 4.2.2 Other International Projects

*Title: International Physics Masterclasses 2011 (European Physical Society and IPPOG project) <http://wyp.teilchenphysik.org/mc.htm>*

National Coordinator : Ivan Melo  
Sub-Coordinator: Gabriela Tarjányiová  
Co-operators : Mikuláš Gintner, Beáta Trpišová, Jozef Kúdelčík, G. Tarjányiová, Remenec, Ivana Kubicová, Marián Janek

## 5 Co-operation

### 5.1 Co-operation Partners in Slovakia

- International Laser Center, Bratislava

- Institute of Electrical Engineering, Slovak Academy of Sciences
- Institute of Physics, Slovak Academy of Sciences, Bratislava
- Dept. of Microelectronics, FEI STU Bratislava
- Institute of Experimental Physics, Slovak Academy of Sciences, Kosice
- Matej Bel University, Banská Bystrica
- KEF FMFI UK Bratislava
- University of P.J. Šafarik, Kosice
- Institute of Experimental and Applied Physics, Czech Technical University in Prague

## 5.2 International co-operation Partners

- Université de Mons - Faculty Polytechnique
- Helsinki University of Technology, Finland
- ISIR, Osaka University, Japan
- ATLAS collaboration, CERN, Switzerland
- University of Frankfurt, Germany
- Aalto University, Finland
- IPHT Jena, Germany
- UFE ČAV, Prague, CZ
- OFTC University of Sydney, Australia
- VŠB-Technical University of Ostrava, CZ
- Joint Institute of Nuclear Research, Dubna, Russia
- TU Ilmenau, Germany
- Instituto do Ceramica y Vidrio (CSIC), Madrid, Spain
- Institute of Technical and Experimental Physics, ÚTEF ČVUT Prague, CZ

## 5.3 Visitors to the Department

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Josef Juráň	ÚTEF ČVUT Prague, CZ	3 months
Irena Vlachynská	University of West Bohemia, Pilsen, CZ	1 day
Hikaru Kobayashi	Osaka University, Japan	1 day
Pawel Zhukowski	Technical University Lublin, PL	2 days

## 5.4 Visits to Foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Mikuláš Gintner	ÚTEF ČVUT Prague, CZ	22 days
Peter Hockicko	University of Jyväskylä, Finland	5 days
	Hochschule Mannheim, Germany	3 days
	Jagiellonian University Krakow, Poland	2 days
Daniel Káčik	University of Limerick, Ireland	2 days
	IPHT Jena Germany	2 days
Ivan Melo	CERN, Geneva	5 days
	Vienna University, Austria	2 days

## 6 Other Activities

### 6.1 Conferences, Workshops, Symposiums Organized by the Department

- 17<sup>th</sup> International Conference Applied Physics of Condensed Matter, APCOM 2011, Vysoké Tatry, Nový Smokovec, June 22 – 24, 2011 (Chair of the Scientific Committee: Peter Bury, Members of the Organizing Committee: Dušan Pudiš (chair), Igor Jamnický, Ivan Martinček, Ivana Kubicová, Ľuboš Šušlik)



- 17th Conference of Slovak and Czech Physicists, Žilina, Sep 5 - 8, 2011 (member of the Scientific Committee: Peter Bury, Members of the Organizing Committee: Peter Bury, Peter Hockicko, Jozef Kúdelčík, Marián Janek, Daniel Káčik)
- National High School Competition Cascade, <http://fyzika.uniza.sk/cascade/>, Ivan Melo, Mikuláš Gintner, Gabriela Tarjániová
- IPPOG (International Particle Physics Outreach Group) meeting, Košice April 14 -16, 2011, Members of the Organizing Committee: Ivan Melo (chair), <http://hep.upjs.sk/EPPOG/>
- Masterclasses Workshop Košice (LHC data released for educational purposes for the first time) – live interview for Slovak Radio1. Organizers and lecturers: Ivan Melo, M. Gintner, Feb 15 -16, 2011, UPJŠ Košice.
- 7th International particle Physics Masterclasses 2011, University of Žilina, March 17<sup>th</sup>, 2011 (Gabriela Tarjániová - main coordinator, Ivan Melo - national coordinator, Mikuláš Gintner, Beáta Trpišová, Jozef Kúdelčík, Ivana Kubicová, Marián Janek, Juraj Remenec
- Lecture Slovaks at CERN 2011, University of Žilina, Oct 12<sup>th</sup>, 2011, young Slovak employees from CERN presented CERN as an attractive employer for Slovak technical students and engineers. Organizer: Ivan Melo.

## 6.2 Seminars Organized by the Department

- (1) „Measurements of superluminal neutrinos in experiment OPERA“  
Lecturer: Mikuláš Gintner, KF ŽU Žilina  
Date: 25. 3. 2010
- (2) „Physical analysis of motions using video recordings“  
Lecturer: Peter Hockicko, KF ŽU Žilina  
Date: 25.1.2011
- (3) „Do not be afraid of Linux“  
Lecturer: Ivan Bellan, KF EF ŽU Žilina  
Date: 1. 2. 2011
- (4) „Alternative laboratory exercises“  
Lecturer: Ivana Kubicová, Mikuláš Gintner, Dušan Pudiš, KF EF ŽU  
Date: 8. 2. 2011
- (5) „Fermi problems“  
Lecturer: Norbert Tarjánji, KF EF ŽU Žilina  
Date: 22. 2. 2011
- (6) „Study of insulating properties of gases and fluids for electric applications“  
Lecturer: Jozef Kúdelčík, KF EF ŽU Žilina  
Date: 10. 5. 2011
- (7) „Use of Interference for investigation of optic fibres properties“  
Lecturer: Daniel Káčik, KF EF ŽU Žilina  
Date: 10. 5. 2011
- (8) „Top-BESS model and its phenomenology“  
Lecturer: Josef Juráň, ÚTEF ČVUT, Prague, CZ  
Date: 24. 5. 2011
- (9) „Masterclasses seminar Extrasolar Planets“  
Lecturer: Peter Vereš, FMFI UK Bratislava  
Date: 6.4.2011

## 6.3 Invited Lectures/Papers

### Masterclasses 2011: Z boson

Lecturer: Mikuláš Gintner, KF EF ŽU Žilina  
Where/date: UPJŠ Košice, 16.2.2011

### Top-BESS model and its phenomenology

Lecturer: Mikuláš Gintner, KF EF ŽU Žilina  
 Where/date: Theoretical Physics Workshop and Summer School, Svit, 4.-11.9.2011

*Top-BESS model and its phenomenology*

Lecturer: Mikuláš Gintner, KF EF ŽU Žilina  
 Where/date: ÚTEF ČVUT Prague, CZ, September 2011

*Top-BESS model and its phenomenology*

Lecturer: Mikuláš Gintner, KF EF ŽU Žilina  
 Josef Juráň, ČVUT Prague, CZ  
 Ivan Melo, KF EF ŽU Žilina  
 Where/date: FMFI UK Bratislava, 15. 11. 2011

*Physical view of the world after 20 months with LHC*

Lecturer: Mikuláš Gintner, KF EF ŽU Žilina  
 Where/date: Matej Bel University, Banská Bystrica, 6.12.2011

*High-frequency acoustical spectroscopy of prospective materials for electrotechnical devices*

Lecturer: Peter Hockicko, KF EF ŽU Žilina  
 Where/date: Technical University Zvolen, 13.9.2011

*History and present-day astronomy in Trenčín*

Lecturer: Jozef Drga, KF EF ŽU Žilina  
 Where/date: Public Library of M. Rešetka, Trenčín

*RECFA Meeting (Restricted European Committee for Future Accelerators + Director General CERN, R. Heuer)*

Lecturer: Ivan Melo, KF EF ŽU Žilina (Outreach activities in Slovakia)  
 Where/date: Košice, 27.5. 2011

*W boson measurement with ATLAS data*

Lecturer: Ivan Melo  
 Where/date: Theoretical Physics Workshop and Summer School 4-11 September 2011, Svit, Slovakia, 9.9.2011

#### 6.4 Membership in International Institutions /Committees

Ivan Melo	- Slovak delegate in IPPOG (International Particle Physics Outreach Group) - Slovak delegate in EPPCN (European Particle Physics Communication Network)
Peter Bury	- chairman of the National IUPAP Committee (International Union for Pure and Applied Physics)
Peter Hockicko	- Member of SEFI (European Society for Engineering Education), PWG (Working Group on Physics), Slovak delegate - Member of the Organizing Committee of PTEE 2011 7. International Conference on Physics Teaching in Engineering Education
Daniel Káčik	- National coordinator COST TD 1001 - Member of the local Organizing Committee of the Conference of the Slovak and Czech Physicists

### 6.5 Membership in National Institutions/Committees

Igor Jamnický	<ul style="list-style-type: none"> <li>- Member of the Working Group of AK (Slovak Accreditation Committee) for the research area 15 Electronics and Electric Power Engineering</li> <li>- Member of the Organizing Committee of 17<sup>th</sup> APCOM conference 2011</li> </ul>
Peter Bury	<ul style="list-style-type: none"> <li>- Member of the Slovak Physical Society Council</li> <li>- Chair of the Scientific Committee of 17<sup>th</sup> Conference APCOM 2011</li> <li>- Member of the Joint Field Commission 11-22-9 Solid State Physics and Acoustics</li> <li>- Member of the Field Commission Solid State Physics and Acoustics at FEI STU Bratislava</li> <li>- Member of the Scientific Committee and the Chair of the Organizing Committee of the 17<sup>th</sup> Conference of Slovak and Czech Physicists, Žilina, 2011</li> </ul>
Ladislav Vikisály	<ul style="list-style-type: none"> <li>- Member of the Trade Union Council of the Educational System Employees Slovakia</li> <li>- Member of the Association of the Trade Unions of Universities and PRO Slovakia</li> </ul>
Dušan Pudiš	<ul style="list-style-type: none"> <li>- Chair of the Organizing Committee of 17<sup>th</sup> Conf. APCOM 2011</li> <li>- Member of COST TD 1001</li> </ul>
Ivan Melo	<ul style="list-style-type: none"> <li>- National coordinator of the 6<sup>th</sup> International Masterclasses in Particle Physics for high school students</li> </ul>
Peter Hockicko	<ul style="list-style-type: none"> <li>- member of the Organizing Committee of the 17<sup>th</sup> Conference of Slovak and Czech Physicists, Žilina, 2011</li> <li>- Member of the Scientific Committee of the 6<sup>th</sup> International Conference Material Acoustics Place 2011, Zvolen</li> </ul>
Marián Janek	<ul style="list-style-type: none"> <li>- member of the Organizing Committee of the 17<sup>th</sup> Conference of Slovak and Czech Physicists, Žilina, 2011</li> </ul>

### 6.6 Membership in University Boards

Ivan Martinček	<ul style="list-style-type: none"> <li>- Member of the Commission for the field 5.2.12 Electrotechnologies and materials</li> </ul>
Dušan Pudiš	<ul style="list-style-type: none"> <li>- member of the Commission for the field 5.2.12 Electrotechnologies and materials</li> <li>- Member of Scientific Council of EF ŽU</li> <li>- Secretary of the Academic Senate of EF ŽU</li> <li>- Member of the Executive Council of the KAP club (alumni and friends of University of Žilina)</li> </ul>
Igor Jamnický	<ul style="list-style-type: none"> <li>- Member of the Commission for the field 5.2.12 Electrotechnologies and materials</li> <li>- Member of Scientific Council of EF ŽU</li> <li>- Member of Scientific Council of University of Žilina</li> <li>- Chairman of Academic Senate of ŽU</li> </ul>
Peter Bury	<ul style="list-style-type: none"> <li>- Chair of the Commission for the field 5.2.12 Electrotechnologies and materials, EF ŽU</li> <li>- Member of Academic Senate of EF ŽU</li> <li>- Member of the Communications journal editorial board</li> <li>- Member of editorial board ŽU, EDIS ŽILINA</li> <li>- Member of Scientific Council EF ŽU</li> </ul>
Ladislav Vikisály	<ul style="list-style-type: none"> <li>- Chair of the Trade Unions, OZ PŠaV ŽU</li> <li>- Member of the Disciplinary committee, ŽU</li> <li>- Member of tender committees at the rectorate of ŽU</li> </ul>

## 7 Publications

### Lecture Notes

- [1] KÚDELČÍK, J., HOCKICKO, P.: *Fundamentals of Physics*, 1<sup>st</sup> edition Žilina, Žilinská univerzita, (2011), 272 p., ISBN 978-80-554-0341-0
- [2] TARJÁNYI, N., KÁČIK, D.: *Fundamentals of optoelectronics*, 1<sup>st</sup> edition – Žilina, Žilinská univerzita, (2011), CD-ROM 2011. 252 p., ISBN 978-80-554-0326-7

### Current Content Journals

- [3] KNOCIKOVÁ, J.: *Time-Frequency Energy Distribution of Phrenic Nerve Discharges During Aspiration Reflex, Cough and Quiet Inspiration*, Computer Methods and Programs in Biomedicine, Vol. 102, No.1 (2011), p. 81-90, ISSN 0169-2607
- [4] PUDIŠ, D., ŠUŠLIK, L., ŠKRINIAROVÁ, J., KOVÁČ, J., MARTINČEK, I., KOVÁČ, J. JR., HAŠČÍK, Š., KUBICOVÁ, I., NOVÁK, J., VESELÝ, M.: *Light extraction from a light emitting diode with photonic structure in the surface layer investigated by NSOM*, Optics & Laser Technology, Elsevier Ltd. (JOLT), Vol.43, No. 5, (2011) 917-921, ISSN 0030-3992
- [5] MARTINČEK, I., PUDIŠ, D., KÁČIK, D., SCHUSTER, K.: *Investigation of intermodal interference of  $LP_{01}$  and  $LP_{11}$  modes in the liquid-core optical fiber for temperature measurements*, Optik Vol.122, iss. 8, (2011) 707-710, ISSN 0030-4026
- [6] PIYADIN, S.M., GURCHIN, Y., KURLKIN, P. K., TEREKHIN, A.A., GLAGOLEV, V.V., ISUPOV, A.Y., ITOH, K., JANEK, M., KARACHUK, J. T.: *Experimets on the study of deuteron-proton interaction at internal target at nuslotron*, International Journal of Modern Physicists A, Vol. 26, nos. 3-4, (2011), p. 683-685, ISSN 0217-751X
- [7] GINTNER, M., JURÁŇ, J., MELO, I.: *Top-BESS model and its phenomenology*, Physical Review D, Vol. 84, no.3, (2011), ISSN 056-2821, p. 035013-1-030013-22
- [8] MEREŠ, M., MELO, I., TOMÁŠIK, B., BALEK, V., ČERNÝ, V.: *Generating heavy particles with energy and momentum conservation*, Computer Physics Communications Vol. 182, no. 12 (2011), pp. 2561-2566, ISSN 0010-4655
- [9] TOMÁŠIK, B., MELO, I., GINTNER, M.: *Non-equilibrium hadronisation and event-by-event fluctuations of rapidity distributions*, Indian J. Phys. Vol. 85, No. 7, (2011) pp. 1097-1101, ISSN 0973-1458
- [10] MARTINČEK, I., PUDIŠ, D.: *Variable Liquid-Core Fiber Optical Attenuator Based on Thermo-Optical Effect*, Journal of lightwave technology, Vol. 29, No. 17, sept. 1, (2011) pp. 2647-2650, ISSN 0733-8724
- [11] JANEK, M. at all.: *The 270MeV deuteron beam polarimeter at the Nuclotron Internal Target Station*, Nuclear Instruments and Methods in Physics Research A., Vol. 642, No. 1, (2011) p. 45-51, ISSN 0168-9002
- [12] HOCKICKO, P., BURY, P., SIDOR, P., KOBAYASHI, H., TAKAHASHI, M., YANASE, T.: *Analysis of A-DLTS spectra of MOS structures with thin NAOS SiO<sub>2</sub> layers*, Central European Journal of Physics. - ISSN 1895-1082. - Vol. 9, no. 1 (2011), p. 242-249

### Patents

- [13] TUREK I., KÁČIK D.: Patent document number 287543 – A method to measure polarization dispersion of optic fibres using low frequency interference

**Journals registered in Thomson Scientific Master Journal List or SCOPUS**

- [14] JANEK, M. at all:  *$\Delta E$ -E Detector for Proton Registration Nonmesonic Deuteron Breakup at the Nuclotron Internal Target*, Physics of Particles and Nuclei Letters, Vol. 8, No. 2, pp. 107-113, (2011) ISSN 1547-4771
- [15] KÚDELČÍK, J., GUTTEN, M., VIRDZEK, P.: *Measurement of electrical parameters of breakdown in transformer oil*, Przegląd elektrotechniczny, Vol. 8, No. 6 (2011), pp. 159-162 ISSN 0033-2097
- [16] JANEK, M. at all: *Recent results with polarized deuterons and polarimetry at Nuclotron-NICA*, Journal of Physics, Vol. 295 (2011), art. No. 012325[8]s., ISSN 1742-6588

**Other journals**

- [17] TVAROŽEK, P., KÁČÍK, D., MARTINČEK, I.: *Physical principles of novel light sources technology*, TECHNOLÓG – journal for theory and practice of mechanical technologies, vol. 3, No. 1, p. 23-28, (2011), ISSN 1337-8996
- [18] KÚDELČÍK, J., VIRDZEK, P., TRPIŠOVÁ, B., KÚDELČÍKOVÁ, M.: *Use of computers in laboratory exercises*, 7<sup>th</sup> international conference on Mathematics and Physics at technical universities, Proceedings part 2 – Physics, Brno 2011, pp. 63-71, ISSN 978-80-7231-816-2
- [19] MARTINČEK, I., PUDIŠ, D., RUSNÁK, J., KUBICOVÁ, I.: *Technology of preparation of microstructure optic fibres from melted quartz*, TECHNOLÓG– journal for theory and practice of mechanical technologies, NT 2011, p. 91-94, ISSN 1337-8996
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## 8 Contact Address

Department of Physics  
Faculty of Electrical Engineering  
University of Žilina  
Univerzitná 1, 010 26 Žilina  
Slovak Republic  
Phone: ++421-41-513 2300  
Fax: ++421-41-513 1516  
E-mail: [kff@fel.uniza.sk](mailto:kff@fel.uniza.sk)  
www: <http://fel.uniza.sk/katedra.htm>

Katedra fyziky  
Elektrotechnická fakulta  
Žilinská univerzita v Žiline  
Univerzitná 1, 010 26 Žilina  
Slovenská republika

## DEPARTMENT OF MEASUREMENT AND ELECTRICAL ENGINEERING

### 1 General Information

Department of Measurement and Applied Electrical Engineering (DMAEE) was founded by dividing of the Department of Theoretical and Applied Electrical Engineering. The history of the department was however started in 1953 when at the Railway University in Prague was originated the Department of Electrical Engineering and the Cabinet of Theoretical Engineering as its part. The independent department was originated in 1957 named Department of Theoretical Electrical Engineering and Electrical Machines, (DTEEM) providing teaching electrical engineering subjects for electrical engineering studies.

The first subject starting the teaching at the Faculty of Electrical Engineering was "Foundations of electrical engineering". Successively the pedagogical process was extended by the subject as theoretical electrical engineering, electrical measurement and the department started to provide teaching of subjects of theory of electrical machines and electrical machines construction as well.

After removing the university from Prague to Žilina and changing its name to University of Transport, the department began providing teaching of electrical engineering subjects at non-electrical study branches and at the same time was separated and become independent the Department of Electrotechnology.

In 1986 was separated from the department the branch of electrical machines and the department was named Department of Electrical Engineering.

In 1993 the department was named Department of Theoretical and Applied Electrical Engineering.

In 2005 the department had two branches: Division of Theoretical Electrical Engineering and Measurement and Division of Applied Electrical Engineering and Measurement. From these divisions arose by their dividing two independent departments: Department of Electromagnetic and Biomedical Engineering and Department of Measurement and Applied Electrical Engineering.

Department of Measurement and Applied Electrical Engineering guarantees bachelor degree study of two study programs: Automobile Electrical Engineering and Commercial Electrical Engineering. The staff of the DMAEE guarantees and provides the course Measurements and Measuring Systems for all students of the Faculty of Electrical Engineering of the University of Žilina, sectional courses for students in study programs Automobile Electrical Engineering and Commercial Electrical Engineering and course Electrical Engineering for students other faculties of the University of Žilina.

Research activities at the Department are aimed mainly to the following areas: diagnosis methods and systems for power transformers testing using modern measuring systems and tools, infrared analysis (thermo-diagnostics) with scanning of thermal field of power electrical and telecommunication equipment and their modelling, simulations and medical applications of thermovision, sensors for technical applications.

Recently the research programme has been extended to electromagnetic non-destructive testing and evaluation of metals and dielectric materials. Research covers also optimization of methods for materials dielectric properties investigation in high-frequency range and possibilities of microwave technique utilization in medical diagnosis and therapeutic applications and in optimization of radiocommunication equipments.

## 2 Staff of the Department

Head of the department:	Dagmar Faktorová, until 15.7.2011
Head of the department:	Miroslav Gutten, from 16.7.2011
Vice head of the department:	Daniel Korenčiak, from 16.7.2011
Secretary:	Milan Šebök, from 16.7.2011
Administrative staff:	Jana Zlatohlavá
Associate professors:	Dagmar Faktorová, Miroslav Gutten, Milan Chupáč, Ján Poliak, Milan Šimko
Senior Lecturers (with PhD):	Martin Brandt, Daniel Korenčiak, Matej Kučera, Milan Šebök
Researcher (with PhD):	Róbert Seewald

### 2.1.1 Postgraduate Students

Internal (full-time):	Katarína Isteníková, Jozef Jurčík
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## 3 Teaching

### 3.1 Courses in Bachelor and Master Degree Programmes

#### 3.1.1 Bachelor Degree Programmes

##### *Courses at the Faculty of Electrical Engineering*

Code Title	Semester	Lessons-Seminars-Exercises		Teachers
		hours/week		
31635 Bachelor Project Automotive EE	6	0 – 0 – 6		Chupáč
31609 Electrical Machines for Automation	6	3 – 1 – 1		Poliak
31604 Bioelectronics	6	2 – 0 – 2		Šimko
31306 Measurement and Measuring Systems	3	2 – 0 – 3		Gutten, Faktorová
31416 Electrical Engineering of Road Vehicles	4	2 – 1 – 2		Chupáč
31519 Inf. and Com. Systems of Road Vehicles	5	2 – 0 – 1		Poliak
31529 Standards for Electrical Engin. Products	5	2 – 1 – 0		Poliak
31562 Diagnostics of Electrical Equipments	4	2 – 1 – 2		Kučera
31513 Sensors for Technical Praxis	5	2 – 1 – 2		Faktorová
31401 Applied Electrical Engineering	4	2 – 1 – 2		Brandt

##### *Courses at the other Faculties*

11P103 Electronics RV and Comm. Technique	1	2 – 0 – 2		Poliak
11P104 Electrical Engineering	2	2 – 0 – 2		Gutten, Šebök Faktorová
11P105 Electrical Engineering	2	2 – 0 – 1		Korenčiak
11P106 Electrical Engineering	2	2 – 1 – 0		Korenčiak
12P105 Electrical Engineering	2	8 – 0 – 8		Chupáč
12P106 Electrical Engineering	2	16 – 0 – 0		Gutten
2B047 Electrical Engineering	4	2 – 0 – 2		Šimko
2B047 Electrical Engineering	4	2 – 1 – 1		Šimko
2B083 Electrical Engineering HV	5	2 – 0 – 2		Chupáč
2B083 Electrical Engineering HV	6	2 – 2 – 0		Chupáč
2B047 Electrical Engineering	5	16 – 6 – 0		Šebök
2B047 Electrical Engineering	5	18 – 4 – 0		Šebök
2B070 Electrical Engineering	4	16 – 6 – 0		Šimko
2B083 Electrical Engineering HV	6	18 – 6 – 0		Chupáč
2B083 Electrical Engineering HV	6	10 – 6 – 0		Chupáč

92043 Electrical Engineering	3	2 – 0 – 1	Poliak
92043 Electrical Engineering	3	2 – 0 – 1	Poliak
92265 Electrical Engineering and fire safety	6	2 – 1 – 0	Šimko
97043 Electrical Engineering	3	12 – 0 – 0	Šimko
97265 Electrical Engineering and fire safety	6	12 – 0 – 0	Šimko

### 3.1.2 Masters Degree Programmes

#### *Courses at the Faculty of Electrical Engineering*

32115 Modelling of Electromagnetic Field	1	1 – 0 – 2	Faktorová
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#### *Courses at the other Faculties*

13P101 Electrical Engineering HV	1	2 – 1 – 0	Chupáč
14P101 Electrical Engineering HV	1	16 – 0 – 0	Chupáč

## 4 Educational, Research and Scientific Projects

### 4.1 National Projects

#### 4.1.1 Research Projects Funded by the Scientific Grant Agency of the Slovak Republic (VEGA)

##### *V-1-0548-09 Diagnostics of Power Transformers in Consideration of Short Currents and Over Currents Effects*

Coordinator: Miroslav Gutten  
 Co-operators: Milan Chupáč, Milan Šimko, Matej Kučera, Daniel Korenčiak, Milan Šebök, Jozef Jurčik

##### *V-1/0007/09 Systems of Radio Broadcasters Thermodiagnosics*

Coordinator: Milan Šimko  
 Co-operators: Dagmar Faktorová, Miroslav Gutten, Milan Chupáč, Matej Kučera, Milan Šebök

##### *V-1/0193/10 Research of Selected Factors Influence for Gigacycle Fatigue of Materials*

Coordinator: Otakar Bokůvka  
 Co-operators: Dagmar Faktorová

#### 4.1.2 Research Projects Funded by the Slovak Research and Development Agency (APVV)

##### *SK-RO-0015-10 Metamaterials for Non-destructive Testing of High-frequency Electromagnetic Methods*

Coordinator: Dagmar Faktorová  
 Co-operators: Katarína Isteníková

##### *APVV-0703-10 Analysis and Diagnostic Measurements of Power Transformers using by Sweep Frequency Response Analysis*

Coordinator: Ján Michalík  
 Co-operators: Martin Brandt, Róbert Seewald, Dagmar Faktorová

#### 4.1.3 Projects of European Structural Funds

##### *ITMS 2620120003 Excellency Centre - Power Electronics Systems and Materials for their Components*

Coordinator: Pavol Špánik  
Co-operators: Martin Brandt, Dagmar Faktorová

*ITMS 26220120072 Excellency Centre - Power Electronics Systems and Materials for their Components II*

Coordinator: Pavol Špánik  
Co-operators: Martin Brandt, Dagmar Faktorová, Miroslav Gutten, Milan Chupáč, Milan Šimko

*ITMS 26220220078 Research of High-Economical Components of Electric Driving Systems of Driving Traction and UMT Vehicles*

Coordinator: Martin Brandt  
Co-operators: Miroslav Gutten

*ITMS 26110230005 Flexible and attractive studies in University of Zilina for labour-market demand and sciential society*

Coordinator: Renáta Švarcová  
Co-operators: Dagmar Faktorová, Miroslav Gutten, Daniel Korenčiak, Milan Šimko

*ITMS 26220220048 Unique Equipment for Valuation of Tribocorrosive Properties of Machine Components Surface*

Coordinator: Branislav Hadzima  
Co-operators: Dagmar Faktorová

## 5 Co-operation

### 5.1 Co-operation Partners in Slovakia

- Slovak University of Technology, Faculty of Electrical Engineering and Information Technology, Bratislava
- Slovak University of Technology, Faculty of Mechanical Engineering, Bratislava
- Technical University of Košice, Faculty of Electrical Engineer. and Informatics, Košice
- Alexander Dubcek University, Faculty of Mechatronics, Trenčín
- Comenius University, Bratislava, Jessenius Faculty of Medicine, Martin
- Slovak Telekom, inc., Bratislava
- Lambda Controls, Ltd., Liptovský Hrádok
- Slovenské elektrárne, inc., Bratislava
- Stredoslovenská energetika inc. Žilina
- EVPU, Ltd. Nová Dubnica
- ZŤS Elektronika, Ltd. Nová Dubnica
- ŽOS Vrútky, inc. Vrútky
- TOYOTA, Ltd. Žilina
- SEPS, inc. Bratislava
- OTC, Ltd. Hlohovec
- BEZ Transformátory, inc. Bratislava
- Micronix, Ltd. Banská Bystrica
- VÚJE, inc. Trnava
- Motocentrum, Ltd. Žilina
- Automax, Ltd. Považská Bystrica
- Slovenská teplárenská, inc. Žilina
- Tepláreň, inc. Považská Bystrica
- TECHNISERV, Ltd. Bratislava
- INA Kysuce, inc. Kysucké Nové Mesto
- Slovenský vodohospodársky podnik, Banská Štiavnica

## 5.2 International Co-operation Partners

- VŠB - Technical University, Ostrava, Czech Republic
- University of West Bohemia, Faculty of Electrical Engineering, Pilsen, Czech Republic
- Czech Technical University, Faculty of Mechanical Engineering, Prague, Czech Republic
- University of Defence, Brno, Czech Republic
- Politechnika Gliwice, Faculty of Electrical Engineering, Poland
- Politechnika Radom, Faculty of Transport, Radom, Poland
- Politechnika Lublin, Faculty of Electrical Engineering and Informatics, Lublin, Poland
- Politechnika Gdansk, Faculty of Electrical and Control Engineering, Gdansk, Poland
- LMU Munich, Germany
- NIRD for Technical Physics Iasi, Romania
- EN-CENTRUM Ltd. Prague, Czech Republic
- TMV SS, Ltd. Praha, Czech Republic
- ETM – Ing. Pavel Hála, Brno, Czech Republic
- ENERGETIKA SERVIS, Ltd. České Budějovice, Czech Republic
- Bosch - Automotive technics, Czech Republic
- Nova Partner, Ltd. Český Brod, Czech Republic
- Haefely-Tettex-Hipotronics Praha, Czech Republic

## 5.3 Visitors to the Department

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Raimond Grimberg	NIRDTP, Iasi, Romania	7 days
Adriana Savin	NIRDTP, Iasi, Romania	7 days
Mikołaj Bartłomiejczyk	Politechnika Gdansk, Poland	5 days
Pawel Zhukowski	Politechnika Lublin, Poland	2 days

## 5.4 Visits to Foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Martin Brandt	ZČU, FEL, Pilsen, Czech Republic	4 days
Dagmar Faktorová	IIT, Chennai, India	9 days
Dagmar Faktorová	CTU, Prague, Czech Republic	4 days
Dagmar Faktorová	University of Coimbra, Funchal, Portugalsko	4 days
Dagmar Faktorová	Università degli Studi di Cass., Neapol, Italy	6 days
	Università degli Studi di Napoli Federico II.	
Dagmar Faktorová	University Pompeu Fabra, Barcelona, Spain	5 days
Dagmar Faktorová	NIRDTP, Iasi, Romania	7 days
Miroslav Gutten	Politechnika Radom, Poland	4 days
Matej Kučera	Politechnika Radom, Poland	4 days
Milan Šebök	Politechnika Radom, Poland	4 days
Ján Poliak	Politechnika Czestochowa, Poland	5 days
Ján Poliak	ZČU, FEL, Pilsen, Czech Republic	1 day

## 5.5 Contracts (Business Activities)

*EF/P-103-0013/11 Thermovision measurement*

Customer: Tepláreň, inc. Považská Bystrica

Coordinators: Milan Chupáč, Milan Šimko

## 6 Other Activities

### 6.1 Invited Lectures/Papers

Title of Lecture: *Metamaterials Applications in Radiocommunication and Biomedical Engineering*  
 Lecturer: Dagmar Faktorová  
 Where/Date: International Conference ISABEL 2011, Barcelona, Spain, 26.10.2011

### 6.2 Membership in International Institutions/Committees

Dagmar Faktorová - IEEE, New York, USA  
 - Programme Committee of the Conference EDS, Brno, Czech Republic  
 - Technical Committee of the Conference ENDE 2011, Chennai, India  
 Milan Šimko - International Journal for Traffic and Transport Engineering (IJTTE), Beograd, Serbia – member of draft committee  
 - Journal ETM, Czech Republic – member of draft committee  
 Milan Chupáč - Journal ETM, Czech Republic – member of draft committee

### 6.3 Membership in National Institutions/Committees

Dagmar Faktorová - Slovak Medical Association, Bratislava  
 Miroslav Gutten - Council of Higher Education Institutions, Bratislava

### 6.4 Membership in University Boards

Dagmar Faktorová - Scientific Board of the Faculty of Electrical Engineering  
 - College of the Dean of the Faculty of Electrical Engineering - to 15.07.2011  
 - Branch Committee for PhD. study field Theory of Electrical Engineering, Faculty of Electrical Engineering  
 - Scientific Committee of the conference Digital technologies 2011  
 Miroslav Gutten - Board of trustees KAP, Faculty of Electrical Engineering  
 - Academic Senate of the Faculty of Electrical Engineering  
 - Executive board KAP, Faculty of Electrical Engineering  
 - College of the Dean of the Faculty of Electrical Engineering - from 16.07.2011  
 Daniel Korenčiak - Informatics Council of the Faculty of Electrical Engineering  
 - Academic Senate of the Faculty of Electrical Engineering  
 Milan Šebök - Working Committee of the VTS, University of Žilina  
 Ján Poliak - Auditing Committee of the VTS, University of Žilina  
 - Faculty Branch Committee for PhD. study field Transportation, Faculty of Operation and Economics of Transport and Communications

## 7 Publications

### Monographs

[1] GUTTEN, M.: *Analysis of short-circuit currents effects on electric equipments*, monograph, University of Žilina in Edis, Žilina 2011, ISBN 978-80-554-0433-2 (in Slovak)

**Journals indexed in a world-wide database (Thomson Scientific Master Journal List or SCOPUS)**

- [2] FAKTOROVÁ, D., ISTENÍKOVÁ, K.: *Numerical Approach to Investigation of Electromagnetic Wave Interaction with Heterogeneous Biological Structure*. In: Acta Technica, Vol. 56, No. 1, 2011, ISSN 0001-7043, pp. 1-9 (in English)
- [3] FAKTOROVÁ, D., ISTENÍKOVÁ, K.: *Modelling of scattering parameters in biological tissues*. In: Przegląd elektrotechniczny = Electrical review, Vol. 87, No. 5, 2011, ISSN 0033-2097, pp. 34-36 (in English)
- [4] ŠEBÖK, M., GUTTEN, M., KUČERA, M.: *Diagnostics of electric equipments by means of thermovision*, In: Przegląd elektrotechniczny = Electrical review, Vol. 87, 2011, ISSN 0033-2097, No. 10, p.313-317 (in English)
- [5] KÚDELČÍK, J., GUTTEN, M., VIRDZEK, P.: *Measurement of electrical parameters of breakdown in transformer oil* In: Przegląd elektrotechniczny = Electrical review, Vol. 87, 2011, ISSN 0033-2097, No. 8, p.159-162 (in English)
- [6] GUTTEN, M., JURČÍK, J., BRANDT, M., POLANSKÝ, R.: *Mechanical effects of short-circuit currents analysis on autotransformer windings*, In: Przegląd elektrotechniczny = Electrical review, Vol. 87, 2011, ISSN 0033-2097, No. 7, p.272-275 (in English)
- [7] ISTENÍKOVÁ, K.: *The influence of inhomogeneity present in layered biological structure on electromagnetic field distribution*, In: Communications: scientific letters of the University of Žilina, Vol. 13, 2011, ISSN 1335-4205, No. 1, p. 37-41 (in English)
- [8] ŠIMKO, M., CHUPÁČ, M.: *Non-destructive method of measurement of radio transmitters antenna systems*, In: Elektronika ir elektrotechnika = Electronics and electrical engineering, Vol. 107, 2011, ISSN 1392-1215, No. 1, p. 33-36 (in English)

**Other Reviewed Foreign Journals**

- [9] BRANDT, M., MICHALÍK, J., SEEWALD, R., SEDLÁK, J.: *Measurement of railway traction transformer using by SFRA*. In: ELECTROSCOPE – on-line magazine, Vol. 6, 2011, ISSN 1802-4564, No. 6 (in English)
- [10] BRANDT, M., MICHALÍK, J., SEEWALD, R., SEDLÁK, J.: *Diagnostic measurements of 3-phase 25MVA transformer and their analysis*. In: TransComp 2011, Computer Systems Aided Science, Industry and Transport Zakopane, 5-8.12.2011, Logistyka, 2011, ISSN 1231-5478, No. 6 (in English)
- [11] PROSR, P., BRANDT, M., MENTLÍK, V., MICHALÍK, J.: *Condition assessment of oil-paper transformer insulating system*. In: Journal of energy and power engineering. Vol. 5, 2011, ISSN 1934-8975, No. 2, p. 173-178 (in English)
- [12] ŠEBÖK, M., KORENČIAK, D., GUTTEN, M.: *Thermovision diagnostics of electrical wirings and equipments*, In: JEE - Journal of Electrical Engineering, Vol. 11, 2011, ISSN 1582-4594, Edition 4, p. 139-142 (in English)
- [13] JURČÍK, J., GUTTEN, M., KORENČIAK, D.: *Analysis of transient actions influence in power transformer*, In: Advances in Electrical and Electronic Engineering, Vol. 9, 2011, ISSN 1804-3119, No. 2, p. 65-69 (in English)
- [14] GUTTEN, M., TRUNKVALTER, M., JURČÍK, J.: *Gas analysis of oil transformer and its monitoring in laboratory conditions*, In: JEE - Journal of Electrical Engineering, Vol. 11, 2011, ISSN 1582-4594, Edition 1, pp. 52-56 (in English)
- [15] GAŠPARÍK, J., KUČERA, S., KUČERA, M.: *Hybrid passenger automobile and its distribution of power output*. In: Logi: scientific journal on transport and logistics, Vol. 2, 2011, ISSN 1804-3216, No. 1, p. 83-85 (in English)
- [16] KUČERA, A., GAŠPARÍK, J., KUČERA, M.: *Implementation of the Continuous Diagnosis as a Mean of Reducing the Operating Costs of Naval Ships*. In: Perner's Contacts, Vol. 6, 2011, ISSN 1801-674X, No. 1, p. 154-160 (in Slovak)

**Other Reviewed Slovak Journals**

- [17] KUČERA, M., KUČERA, A.: *Efficiency of rope transport*, In: Horizons of transport, Vol. 19, 2011, ISSN 1210-0978, No. 5, p. 52-54 (in English)



**Papers in proceedings of the world congress/conference published in prestigious foreign publisher such as Springer, Kluwer, Elsevier, John Wiley etc., or published by world-wide reputable scientific institutions such as IFAC, IFIP, IEEE, ACM, IET, SPIE, or listed in Web of Science**

- [18] FAKTOROVÁ, D., ČERNEK, R., IŠTENÍKOVÁ, K.: *Design of Frequency Selective Sensor with Metamaterial Structure for Dielectric Properties Determination*. In: Applied Electromagnetics and Mechanics - 15<sup>th</sup> International symposium, 07-09 September, 2011, Napoli, Italy, ISBN 978-4-931455-19-1, JSAEM Studies in Applied Electromagnetics and Mechanics, Vol. 14, ISSN 1343-2869, p. 557-558 (in English)
- [19] FAKTOROVÁ, D.: *Solid Materials Complex Permittivity and Inhomogeneities Determination in High Frequency Range*. In: Studies in Applied Electromagnetics and Mechanics, ISSN 1383-7281, Electromagnetic Nondestructive Evaluation (XIV), Amsterdam, IOS Press, Vol. 35, 2011, ISBN 978-1-60750-749-9, p. 410-416 (in English)

**Reviewed Conference Proceedings Abroad (if not included above)**

- [20] BRANDT, M., MICHALÍK, J., KUČHTA, J.: *Measurement of railway traction transformer using by SFRA method - part 1*. In: Diagnostics 2011, September 06-08, 2011, Kašperské Hory, Czech Republic, ISBN 978-80-261-0020-1, p. 57-60 (in English)
- [21] BRANDT, M., SEEWALD, R., SEDLÁK, J., FAKTOROVÁ, D.: *Measurement and Analysis of Railway Traction Transformer Using by SFRA Method - Part 2*. In: Diagnostics 2011, September 06-08, 2011, Kašperské Hory, Czech Republic, ISBN 978-80-261-0020-1, p. 61-64 (in English)
- [22] SAVIN, A., FAKTOROVÁ, D., GRIMBERG, R.: *High Frequency Eddy Current Testing*. In: NDT in Progress 2011 - 6<sup>th</sup> International Workshop of NDT Experts, October 10-12, 2011, Prague, Czech Republic, ISBN 978-80-214-4339-6, pp. 269-276 (in English)
- [23] FAKTOROVÁ, D.: *Metamaterial Structure Using in Nondestructive Evaluation of Inhomogeneities in Metal Sample*. In: EDS 2011 - Electronic Devices and Systems, June 22-23, 2011, Brno, Czech Republic, ISBN 978-80-214-4303-7, pp. 70-74 (in English)
- [24] FAKTOROVÁ, D.: *Dielectric Materials Parameters Characterization Using Waveguide Probe Tuned with Metamaterial*. In: ISMOT 2011 - 25<sup>th</sup> International Symposium on Microwave and Optical Technology, June 20-23, 2011, Prague, Czech Republic, ISBN 978-80-01-04887-0, pp. 139-142 (in English)
- [25] FAKTOROVÁ, D.: *Improvement of Microwave Probe for Non-destructive Testing with Metamaterial Structure*. In: ISEF 2011 - 15<sup>th</sup> International Symposium on Electromagnetics Fields in Mechatronics, Electrical and Electronic Engineering, September 01-03, 2011, Funchal, Portugal, ISBN 978-972-8822-24-8, p. 6 (in English)
- [26] IŠTENÍKOVÁ, K., FAKTOROVÁ, D.: *Influence of Biological Tissue Structure on Absorption of Electromagnetic Field in Human Body Model*. In: Trends in Biomedical Engineering, September 21-23, 2011, Rožnov pod Radhoštěm, Czech Republic, ISBN 978-80-248-2475-8, p. 191-194 (in English)
- [27] ŠEBŮK M., GUTTEN M., KUČERA M., KORENČIAK, D.: *Energy audit and revision of power equipments*, In: Diagnostics 2011, September 06-08, 2011, Kašperské Hory, Czech Republic, ISBN 978-80-261-0020-1, p. 85-88 (in English)
- [28] POLIAK, J., GUTTEN M.: *Analysis of induction machine reliability by means of FRA method*, In: Diagnostics 2011, September 06-08, 2011, Kašperské Hory, Czech Republic, ISBN 978-80-261-0020-1, p. 177-180 (in English)
- [29] POLIAK, J.: *Technical diagnostics of electromobiles*, In: International conference DIAGO 2011, Hotel Relax, Rožnou pod Radhoštěm, 1.-2.2.2011, ISSN 1210-311X (CD-ROM is supplement: Technical diagnostics), p. 366-368 (in Slovak)

**Reviewed Conference Proceedings in Slovakia**

- [30] SEEWALD, R., PALČEK, P.; BRANDT, M. NEČAS, L.: *Measurement of surface temperature of polymerization reaction of bone cement with thermovision camera*. In: TRANSCOM 2011 - 9<sup>th</sup> European Conference of Young Research and Scientific Work-

- ers, June 27-29, 2011, Žilina, Slovak Republic, ISBN 978-80-554-0374-8, p. 163-166 (in English)
- [31] BRANDT, M., MICHALÍK, J., SEDLÁK, J.: *Analysis of traction vehicle transformer prototype by means of SFRA method*, In: Central European School of Doctoral Study: in the Field of Power Electrical Engineering and Automation, 20.-22.9 2011, Trenčianske Teplice, Slovak Republic, ISBN 978-80-554-0421-9, p. 8-11 (in Slovak)
- [32] ŠKORÍK, V., BUKOVINOVÁ, L., HADZIMA, B., FAKTOROVÁ, D.: *Electrochemical Properties of Heat Influenced Structures Made of Austenitic Stainless Steel*. In: TRANSCOM 2011 - 9<sup>th</sup> European Conference of Young Research and Scientific Workers, June 27-29, 2011, Žilina, Slovak Republic, ISBN 978-80-554-0374-8, p. 185-188 (in English)
- [33] JURČÍK, J.: *Analysis of the electromagnetic effects on the power transformer winding and its insulation*. In: TRANSCOM 2011 - 9<sup>th</sup> European Conference of Young Research and Scientific Workers, June 27-29, 2011, Žilina, Slovak Republic, ISBN 978-80-554-0373-1, p. 55-58 (in English)
- [34] ISTENÍKOVÁ, K.: *Metamaterial sensors for biological tissue permittivity measurement based on split ring resonators*. In: TRANSCOM 2011 - 9<sup>th</sup> European Conference of Young Research and Scientific Workers, June 27-29, 2011, Žilina, Slovak Republic, ISBN 978-80-554-0373-1, p. 47-50 (in English)

### Other Publications

- [35] FAKTOROVÁ, D.: *Enhancement of Microwave Probe for Filled Defects Non-Destructive Evaluation with Metamaterials Structures*. In: Book of abstracts ENDE 2011 - The 16<sup>th</sup> International Workshop on Electromagnetic Nondestructive Evaluation, March 10-12, 2011, Chennai, India, p. 115-116 (in English)
- [36] ISTENÍKOVÁ, K., FAKTOROVÁ, D.: *Investigation of Metamaterial Structure Influence on Selective Properties of Microwave Waveguide Sensor*. In: Book of abstracts AMTEE'11 - Advanced Methods in the Theory of Electrical Engineering – 10<sup>th</sup> International Conference, September 6-9, 2011, Klatovy, Czech Republic, ISBN 978-80-7043-993-7, p. III-13 - III-14 (in English)
- [37] ISTENÍKOVÁ, K., FAKTOROVÁ, D.: *Measurement and Numerical Simulation of Electromagnetic Wave Interaction with Layered Biological Structure*. In: Physiological research Physiological research, Vol. 59, No. 5, 2010, ISSN 0862-8408, p. 37P (in English)
- [38] KUČERA, J., ŠIMKO, M., CHUPÁČ, M.: *Monitoring of thermal processes on antenna systems of broadcast transmitter*. In: Electro: technical journal for electrical engineering, Vol. 21, 2011, ISSN 1210-0889, No. 10, pp. 83-85 (in Slovak)
- [39] CHUPÁČ, M., ŠIMKO, M.: *Thermograph measurements on distribution network equipments*. In: Electrotechnical magazine ETM, Vol. 21, 2011, ISSN 1210-5422, No. 5, pp. 30-33 (In Slovak)
- [40] POLIAK, J.: *Industrial park I.*, review on industrial park in Ulaanbaatar, Mongolia
- [41] GUTTEN, M.: *Algorithm development of indirect measurement of process parameters and their utilization for automated control*, review on project VEGA

### SCI Citation

- FAKTOROVÁ, D.: *Microwave Nondestructive Testing of Dielectric Materials*. In Advances in Electrical and Electronic Engineering, Vol. 5, No. 1-2, 2006, ISSN 1336-1376, pp. 230-233.
- [42] PRASETIADI, A., E., MUNIR, A.: *Relative Permittivity Characterization of Foliages Based on Rectangular Waveguide*. In: TSSA - The 16<sup>th</sup> International Conference on Telecommunication Systems, Services and Application, October 20-21, 2011, Denpasar, Indonesia, art. no. 6095445, pp. 253-256.

FAKTOROVÁ, D.: *Complex Permittivity of Biological Materials Measurement at Microwave Frequencies*. In Measurement Science Review, Vol. 7, Section 2, No. 2, 2007, ISSN 1335-8871, pp. 12-15.

- [43] HENGCHAROEN, T., EAIPRASERTSAK, K., FUANGFOONG, M.: *Microwave Dielectric Measurement of Liquids by Using Waveguide Plunger Technique*. In: Engineering Procedia, Elsevier, Vol. 8, 2011, ISSN 1877-7058, pp. 270-274.
- ČAMAJ, P., SEELIGER, H., ISCHENKO, I., KREBS, S., BLUM, H., DE TONI, E., FAKTOROVÁ, D., JAUCH, K.W., BRUNS, CH.: *EFEMP1 Binds the EGF Receptor and Activates MAPK and Akt Pathways in Pancreatic Carcinoma Cells*, In: Biological Chemistry, Vol. 390, No. 12, 2009, ISSN 1431-6730, pp. 1293-1302.
- [44] TONG, J., D., JIAO, N., L., WANG, Y., X., et al.: *Downregulation of Fibulin-3 Gene by Promoter Methylation in Colorectal Cancer Predicts Adverse Prognosis*. In: Neoplasma, Vol. 58, Iss. 5, 2011, ISSN 0028-2685, pp. 441-448.
- [45] HU Y., PIOLI, P., D., SIEGEL, E., et al.: *EFEMP1 Suppresses Malignant Glioma Growth and Exerts its Action within the Tumour Extracellular Compartment*. In: Molecular Cancer, Vol. 10, ISSN 1541-7786, a. no. 123.
- [46] SONG, E., L., HOU, Y., P., CHEN, S., et al.: *EFEMP1 Expression Promotes Angiogenesis and Accelerates the Growth of Cervical Cancer in Vivo*. In: Gynecologic Oncology, Vol. 121, No. 1, 2011, ISSN 0090-8258, pp. 174-180.
- ŠEBÖK, M., KUČERA, S., KUČERA, M.: *Diagnostics of electrical equipment using radiance sensors*, In: ELEKTRO 2008: proceedings of the 7th international conference: Žilina, May 20-21, 2008, Žilina, 2008, ISBN 978-80-8070-845-0, p. 154-156
- [47] GUTTEN, M., JURČÍK, J., BRANDT, M., POLANSKÝ, R.: *Mechanical effects of short-circuit currents analysis on autotransformer windings*, In: Przegląd elektrotechniczny = Electrical review, Vol. 87, 2011, ISSN 0033-2097, No. 7, p.272-275
- CHUPÁČ, M., KORENČIAK, D., ŠIMKO, M.: *Thermodiagnosics*, In: Electrotechnical magazine ETM, Vol. 18, 2008, ISSN 1210-5422, No. 2, p.50-54
- [48] ŠEBÖK, M., GUTTEN, M., KUČERA, M.: *Diagnostics of electric equipments by means of thermovision*, In: Przegląd elektrotechniczny = Electrical review, Vol. 87, 2011, ISSN 0033-2097, No. 10, p.313-317

## 8 Contact Address

Department of Measurement  
and Applied Electrical Engineering  
Faculty of Electrical Engineering  
University of Žilina  
Univerzitná 1, 010 26 Žilina  
Slovak Republic  
Phone:++421-41-513 2129  
Fax: ++421-41-513 1529  
E-mail: [kmae@fel.uniza.sk](mailto:kmae@fel.uniza.sk)  
www: <http://fel.uniza.sk/kmae>

Katedra merania a aplikovanej  
elektrotechniky  
Elektrotechnická fakulta  
Žilinská univerzita  
Univerzitná 1, 010 26 Žilina  
Slovenská republika

## DEPARTMENT OF ELECTROMAGNETIC AND BIOMEDICAL ENGINEERING

### 1 General Information

The original name of the department, founded in 1953 as a part of the Faculty of Electrical Engineering at the University of Railways in Prague, was the Department of Theoretical Electrical Engineering and Electric Machines.

After separating the Electric Machines' section, the education orientation of the Department was partly changed. For that reason the department was renamed to the Department of Theoretical Electrical Engineering in 1986. Since 1989, after spreading the teaching subjects to non-electrical branches of study of other faculties at the University of Žilina, the department was renamed to the Department of Theoretical and Applied Electrical Engineering.

Due to reorganization in 2005 the department has been divided into two independent departments which are Department of Electromagnetic and Biomedical Engineering (DEBE) and the Department of Measurement and Applied Electrical Engineering.

At present, the Department of Electromagnetic and Biomedical Engineering has two divisions. The Division of Electromagnetic Engineering provides courses and lectures of Theory of Electrical Engineering 1, B, 2, 3, Selected Topics from Theory of Electrical Engineering, Selected Chapters from Electromagnetic Theory, Fundamentals of Electromagnetic Compatibility, and Electromagnetic Compatibility for the students of the Faculty of Electrical Engineering. The Division of Biomedical Engineering provides teaching of some interdisciplinary and special subjects for the students of Biomedical Engineering (BME) study field. There are mainly the following subjects: Sensors and Measuring Methods in BME, Wave Processes in BME, Modelling and Simulation in BME, Signal Processing in Medicine, Biomedical Image Processing, Technical Means in Medicine, Radiation and Protection against Radiation, Instrumentation in Medicine, Fundamentals of Ecology, Bachelor's Project 1 and 2, Bachelor's Thesis BME, Diploma Project, Diploma Seminar and Diploma Thesis.

After the official accreditation of the master programme Biomedical Engineering in 2000 at the Faculty of Electrical Engineering, the department became the responsible one for the education and professional level of the study programme BME. In 2004 the Biomedical Engineering study programme was reaccredited for two grades study - Bachelor and Master degrees and the study programme in both grades has been approved by the last complex accreditation of the University of Žilina in 2009. The DEBE is the main guarantee of the study programme BME.

Along with the BME, the Department of Electromagnetic and Biomedical Engineering is the main one responsible for the postgraduate doctoral programme Theory of Electrical Engineering (TEE). The staff of DEBE guarantees and provides the courses for the PhD. study in TEE. The study programme TEE has also been approved by the last complex accreditation of the University of Žilina in 2009. The Faculty of Electrical Engineering repeatedly obtained the rights to habilitate associate professors and to inaugurate full professors in this study field along with. The DEBE guarantees the above mentioned processes.

The research activities of the department are aimed mainly to the following topics: investigation of electromagnetic field and its interactions with various media, methods and tools of material non-destructive evaluation, problems of electromagnetic compatibility and biocompatibility, biomedical sensors and modelling, simulations of dynamic biological systems mainly for the use in medical diagnostics and electromagnetic field influence on living organisms.

## 2 Staff of the Department

Head of the Department : Klára Čápková  
 Vice-head of the Department : Ladislav Janoušek  
 Secretary : Daniela Gombárska  
 Administrative Support : Ester Kyselová

### 2.1 Sections of the Department

#### 2.1.1 Section of Electromagnetic Engineering

Head of the Section : Ladislav Janoušek  
 Professors : Klára Čápková  
 Associate Professors : Ladislav Janoušek  
 Research Fellows : Milan Smetana, Tatiana Strapáčová  
 Senior Lecturers (with PhD) : Vilibalda Darmová, Stanislav Hurta

#### 2.1.2 Section of Biomedical Engineering

Head of the Section : Mariana Beňová  
 Professors : Ivo Čáp  
 Research Fellows : Ján Barabáš (from 1<sup>st</sup> November 2011)  
 Senior Lecturers (with PhD) : Branko Babušiak, Mariana Beňová, Michal Gála, Daniela Gombárska, Zuzana Pšenáková

#### 2.1.3 Postgraduate Students

Internal (full-time) : Marcel Alman (until 30<sup>th</sup> September 2011), Ján Barabáš (until 30<sup>th</sup> September 2011), Štefan Borik (from 1<sup>st</sup> September 2011), Viera Maťková, Mária Michniaková, Roman Radil

#### 2.1.4 External teachers (Biomedical Engineering)

Professors : Kamil Javorka <sup>1)</sup>, Albert Stránsky <sup>1)</sup>, Ján Jakuš <sup>1)</sup>, Ján Lehotský <sup>1)</sup>, Anton Lacko <sup>2)</sup>  
 Associate Professors : Viera Jakušová <sup>1)</sup>, Michal Javorka <sup>1)</sup>, Yvetta Mellová <sup>1)</sup>, Martin Pěč <sup>1)</sup>, Ivan Poliaček <sup>1)</sup>  
 Senior Lecturers : Juraj Čáp <sup>1)</sup>, Ľubomír Kočner <sup>3)</sup>, Michaela Černá <sup>4)</sup>  
<sup>1)</sup> Jessenius Medical Faculty of the Comenius University in Martin  
<sup>2)</sup> Faculty of Health Care, Catholic University in Ružomberok  
<sup>3)</sup> Central Military Hospital in Ružomberok  
<sup>4)</sup> Hospital with Polyclinic in Žilina

## 3 Teaching

### 3.1 Courses in Bachelor and Master Degree Programmes

#### 3.1.1 Bachelor Degree Programmes

Code	Title	Lessons-Seminars-Exercises		
		Semester	hours/week	Teachers
<i>Courses at the Faculty of Electrical Engineering</i>				
31205	Theory of Electrical Engineering 1	2	3 – 3 – 0	Čápková, I. Čáp

31206	Theory of Electrical Engineering B	2	3 – 3 – 0	Darmová
31314	Theory of Electrical Engineering 2	3	3 – 3 – 0	Čápková, I. Čápek
31316	Selected Topics from Theory of Electrical Engineering	3	2 – 1 – 0	Beňová
31439	Sensors and Measuring Methods in BME	4	2 – 0 – 1	I. Čápek
31442	Theory of Electrical Engineering 3	4	3 – 2 – 0	Janoušek
31503	Bachelor's Project 1	5	0 – 2 – 0	Beňová
31543	Wave Processes in BME	5	2 – 2 – 0	I. Čápek
31601	Bachelor's Thesis BME	6	0 – 2 – 0	Beňová
31603	Bachelor's Project 2	6	0 – 3 – 0	Beňová

Within the framework of the cooperation with the external teachers from the Jessenius Medical Faculty of the Comenius University in Martin the following courses for the students of BME are provided:

31106	Fundamentals of Anatomy and Histology 1	1	2 – 0 – 2	Mellová
31207	Fundamentals of Anatomy and Histology 2	2	2 – 0 – 2	Mellová
31304	Medical Biology	3	2 – 0 – 2	Péč
31423	Medical Biophysics	4	2 – 0 – 2	Stránsky, Jakuš
31448	Fundamentals of Biochemistry	4	2 – 0 – 2	Lehotský
31553	Fundamentals of Physiology and Pathological Physiology 1	5	2 – 0 – 2	M. Javorka
31629	Fundamentals of Physiology and Pathological Physiology 2	6	4 – 0 – 4	K. Javorka

### 3.1.2 Master Degree Programmes

Code	Title	Semester	Lessons-Seminars-Exercises		Teachers
			hours/week		
<i>Courses at the Faculty of Electrical Engineering</i>					
32114	Modelling and Simulation in BME	1	2 – 0 – 2		Gombárska
32135	Selected Chapters from Electromagnetic Theory	1	3 – 2 – 0		Janoušek
32138	Fundamentals of Electromagnetic Compatibility	1	2 – 1 – 0		Hurta
32141	Biomedical Image Processing	1	2 – 0 – 2		Babušiak, Gála
32245	Radiation and Protection against Radiation	2	1 – 0 – 1		Darmová
32246	Signal Processing in Medicine	2	2 – 2 – 1		Gombárska
32310	Electromagnetic Compatibility	3	2 – 0 – 1		Hurta
32334	Diploma Project	3	0 – 8 – 0		Babušiak, Gála
32402	Diploma Thesis	4	0 – 2 – 0		Gombárska
32404	Diploma Seminar	4	0 – 5 – 0		Gombárska
32426	Fundamentals of Ecology	4	4 – 4 – 0		Beňová

Within the framework of the cooperation with the external teachers from the Jessenius Medical Faculty of the Comenius University in Martin, the Faculty of Health Care of the Catholic University in Ružomberok, Central Military Hospital in Ružomberok and the Hospital with Policlinic in Žilina the following courses for the students of BME are provided:

32206	Technical Means in Medicine	2	2 – 0 – 2	I. Čápek, Lacko
32244	Basic Diagnostic and Therapeutic Methods in Medicine	2	2 – 0 – 2	Jakuš
32304	Bioethics and Medical Ethics	3	2 – 2 – 0	J. Čápek
32319	Management of Health Services	3	2 – 2 – 0	Jakušová
32331	Instrumentation in Medicine	3	0 – 2 – 0	Beňová, Černá

## 4 Educational, Research and Scientific Projects

### 4.1 National Projects

#### 4.1.1 Research Projects Funded by the Scientific Grant Agency of the Slovak Republic (VEGA)

*Title: Research on Application Possibilities of Eddy Currents Non-harmonic Excitation in Quantitative Non-destructive Evaluation of Conductive Materials (VEGA 1/0765/11)*

Coordinator: Ladislav Janoušek

Co-operators: Klára Čápková, Ivo Čáp, Branko Babušiak, Mariana Beňová, Michal Gála, Daniela Gombárska, Milan Smetana, Tatiana Strapáčová, Marcel Alman, Mária Michniaková

*Title: Research of the New Approaches to Monitoring and Evaluation of Biomaterials by Electromagnetic Methods (VEGA 1/0927/11)*

Coordinator: Klára Čápková

Co-operators: Ivo Čáp, Ladislav Janoušek, Branko Babušiak, Mariana Beňová, Michal Gála, Daniela Gombárska, Milan Smetana, Tatiana Strapáčová, Marcel Alman, Viera Maťková, Mária Michniaková

*Title: Regulation of Excitability and Respiratory Motor Output under Coughing and other Reflexes from Breathing System in Anaesthetized Casts and Rabbits (VEGA 1/0038/09)*

Coordinator: Ján Jakuš (Jessenius Medical Faculty of the Comenius University in Martin)

Co-operators: Ivo Čáp

*Title: Research of Topologies and Control of Power Electronic Excitation System with Single-Phase HF Input and Two-Phase Orthogonal Output for Two-Phase SM/AM Electric Motors (VEGA 1/0470/09)*

Coordinator: Branislav Dobrucký (DME)

Co-operators: Mariana Beňová

#### 4.1.2 Research Projects Funded by the Slovak Research and Development Agency (APVV)

*Title: Towards Electromagnetic Induction Based Methods to Meet their True Potential in Non-destructive Monitoring of Conductive Structures (APVV-0349-10)*

Coordinator: Ladislav Janoušek

Co-operators: Klára Čápková, Ivo Čáp, Branko Babušiak, Mariana Beňová, Michal Gála, Daniela Gombárska, Milan Smetana, Tatiana Strapáčová, Marcel Alman, Mária Michniaková

*Title: Research on Methods for Enhancing the Information Rate of Signals in Quantitative Non-destructive Evaluation of Conductive Materials (APVV-0194-07)*

Coordinator: Ladislav Janoušek

Co-operators: Klára Čápková, Ivo Čáp, Mariana Beňová, Daniela Gombárska, Zuzana Pšenáková, Milan Smetana, Tatiana Strapáčová, Barbora Czipelová, Marcel Alman, Mária Michniaková

*Title: Searching and Education of Talented Students at Primary and Secondary Schools in Science by means of Talents' Competitions (APVV LPP-0067-07)*

Coordinator: Ivo Čáp

#### 4.1.3 Projects of European Structural Funds

*Title: Flexible and Attractive Study at the University of Žilina for the Labour Market's Requirements and for the Knowledge Society (26110230005)*

Coordinator: Renáta Švarcová (rector's office)

Co-operators: Klára Čáповá, Ivo Čáp, Ladislav Janoušek, Branko Babušiak, Mariana Beňová, Michal Gála, Daniela Gombárska, Milan Smetana, Tatiana Strapáčová

*Title: Research on Technologies and Products for Intelligent Clothing and Technical Textiles (26220220134)*

Coordinator: Ján Šesták (VÚTCH-CHEMITEX, Žilina)

Co-operators: Ladislav Janoušek, Branko Babušiak, Michal Gála, Milan Smetana

*Title: Competence Centre for Research and Development in Diagnosis and Therapy of Carcinoma (26220220153)*

Coordinator: Dušan Mištuna (Jessenius Medical Faculty of the Comenius University in Martin)

Co-operators: Branko Babušiak, Ján Barabáš, Michal Gála, Roman Radil

*Title: Modification and Verification of Surgical Tools (26220220121)*

Coordinator: Radomila Konečná (FME, DME)

Co-operators: Ladislav Janoušek, Mariana Beňová, Milan Smetana

*Title: Centre of Excellence of Power Electronic Systems and Materials for their Components (26220120003)*

Coordinator: Pavol Špánik (DME)

Co-operators: Ladislav Janoušek

*Title: Centre of Excellence of Power Electronic Systems and Materials for their Components II (26220120046)*

Coordinator: Pavol Špánik (DME)

Co-operators: Ladislav Janoušek

#### 4.1.4 Other National Projects – Ministry of Defence of Slovak Republic

*Title: Helicopter Fuselage Crack Monitoring and Prognosis through On-board Sensor Network (HECTOR) – co-financing project (SEOP-17-13/2011-OdPP)*

Coordinator: Róbert Hudec (DTM)

Co-operators: Ladislav Janoušek

## 4.2 International Projects

#### 4.2.1 7<sup>th</sup> Frame Programme - CSA

*Title: European Science and Technology in Action Building Links with Industry, Schools and Home "ESTABLISH" (244749)*

Coordinator: Eilish McLoughlin (Dublin City University)

Co-operators: Ivo Čáp

#### 4.2.2 Other International Projects – European Defence Agency (EDA)

*Title: Helicopter Fuselage Crack Monitoring and Prognosis through On-board Sensor Network "HECTOR" (A-0930-RT-GC)*

Coordinator: Róbert Hudec (DTM)

Co-operators: Ivo Čáp, Ladislav Janoušek, Milan Smetana



## 5 Co-operation

### 5.1 Co-operation Partners in Slovakia

- Technical University, Košice
- Slovak Technical University, Bratislava
- Medical Faculty of the Comenius University, Bratislava
- Jessenius Medical Faculty of the Comenius University, Martin
- Faculty of Health Care, Catholic University in Ružomberok, Ružomberok
- Central Military Hospital, Ružomberok
- University of A. Dubček, Trenčín
- Technical University in Zvolen, Zvolen
- Department of Electronics, The Academy of Armed Forces, Liptovský Mikuláš
- Constantine the Philosopher University in Nitra, Nitra
- Institute of Measurement Science SAS, Bratislava
- Slovak Institute of Metrology, Bratislava
- Hospital with Policlinic, Žilina
- Hospital of Jessenius Medical Faculty of the Comenius University, Martin
- ŽSR, Headquarters, Infrastructure Management Department, Bratislava
- Railway Institute for Research and Development, Žilina

### 5.2 International Co-operation Partners

- Tokyo University, Tokyo, Japan
- Tohoku University, Tohoku, Japan
- IIU Corp., Tokyo, Japan
- University of Kanazawa, Kanazawa, Japan
- Technical University RWTH, Aachen, Germany
- University of Technology, Compiègne, France
- Technical University, Graz, Austria
- National University of Ireland, Dublin, Ireland
- Xi'an Jiaotong University, School of Aerospace, Xi'an, China
- Czech Technical University, Prague, Czech Republic
- Technical University VŠB, Ostrava, Czech Republic
- Technical University, Brno, Czech Republic
- University of West Bohemia, Plzeň, Czech Republic
- Academy of Science, Prague, Czech Republic
- Norwegian University of Science and Technology, Trondheim, Norway
- Faculty of Education, University of Hradec Králové, Hradec Králové, Czech Republic
- Faculty of Science, University of Ostrava, Ostrava, Czech Republic
- Politecnico di Milano, Dipartimento di Meccanica, Milan, Italy
- AGUSTAWESTLAND, Sarnate, Italy
- VITROCISET, Rome, Italy
- Consorzio Milano Ricerche, Milan, Italy
- SINTEF ICT, Dept. for Optical Measurement Systems and Data Analysis, Trondheim, Norway
- AGH University of Science and Technology, Department of Telecommunications, Krakow, Poland
- University of Patras, Department of Mechanical Engineering and Aeronautics, Patras, Greece
- Department of Electrical and Computer Engineering, Michigan State University, East Lansing, USA
- Nondestructive Testing Department, National Institute of Research and Development for Technical Physics, Iasi, Romania

**5.3 Visitors to the Department**

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Vladimir Blazek	TU RWTH, Aachen, Germany	4 days
Eva Pietka	TU Gliwice, Poland	1 day
Martin Černý	TU-VŠB, Ostrava, Czech Republic	5 days

**5.4 Visits to Foreign Institutions**

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>	
Klára Čápková	TU RWTH, Aachen, Germany	7 days	
	Indian Institute of Technology Madras, Chennai, India	7 days	
	EC, DG Research, Brussels, Belgium	6 days	
	Chulalongkorn University, Bangkok, Thailand	7 days	
Ivo Čáp	Universita degli studi di Napoli, Italy	6 days	
	VŠB-TU, Rožnov pod Radhoštěm, Czech Republic	3 days	
	TU RWTH, Aachen, Germany	7 days	
	PdF UHK, Hradec Králové, Czech Republic	2 days	
	Universita degli studi di Napoli, Italy	6 days	
	Chulalongkorn University, Bangkok, Thailand	7 days	
	EC, DG Research, Brussels, Belgium	6 days	
	Academy of Sciences, Prague, Czech Republic	1 day	
	VŠB-TU, Rožnov pod Radhoštěm, Czech Republic	3 days	
	Ladislav Janoušek	Rohmann GmbH, Frankenthal, Germany	2 days
Indian Institute of Technology Madras, Chennai, India		7 days	
EC, DG Research, Brussels, Belgium		4 days	
EDA, Brussels, Belgium		4 days	
Politecnico di Milano, Milano, Italy		9 days	
Universita degli studi di Napoli, Italy		6 days	
VŠB-TU, Rožnov pod Radhoštěm, Czech Republic		3 days	
Mariana Beňová		UWB, Klatovy, Czech Republic	4 days
		Michal Gála	VŠB-TU, Rožnov pod Radhoštěm, Czech Republic
Daniela Gombárska			UWB, Klatovy, Czech Republic
	Milan Smetana	Rohmann GmbH, Frankenthal, Germany	2 days
Indian Institute of Technology Madras, Chennai, India		7 days	
Universita degli studi di Napoli, Italy		6 days	
VŠB-TU, Rožnov pod Radhoštěm, Czech Republic		3 days	
Tatiana Strapáčová		Indian Institute of Technology Madras, Chennai, India	7 days
		Universita degli studi di Napoli, Italy	6 days
	VŠB-TU, Rožnov pod Radhoštěm,		

	Czech Republic	3 days
Ján Barabáš	CTU, Prague, Czech Republic	2 days
	VŠB-TU, Rožnov pod Radhoštěm, Czech Republic	3 days
Viera Maťková	VŠB-TU, Ostrava, Czech Republic	1 day
Mária Michniaková	Technische Universität, Darmstadt, Germany	3 months
	Otto-von-Guericke Universität, Magdeburg, Germany	2 months
	VŠB-TU, Ostrava, Czech Republic	1 day
	UWB, Klatovy, Czech Republic	4 days
	BUT, Vsáčky Cáb, Czech Republic	3 days
Roman Radil	VŠB-TU, Rožnov pod Radhoštěm, Czech Republic	3 days

## 6 Other Activities

### 6.1 Invited Lectures/Papers

*Title of Lecture: Modern physics from viewpoint of students*

Lecturer: Ivo Čáp

Where/Date: Catholic University, Ružomberok, Slovakia, conference "Physical education in the context of modern physics" / 27<sup>th</sup>-28<sup>th</sup> January 2011

*Title of Lecture: The trends of biomedical engineering development at the Department of Electromagnetic and Biomedical Engineering at the University of Žilina*

Lecturer: Klára Čápková

Where/Date: Helmholtz Institute of BME, TU RWTH, Aachen, Germany / 24<sup>th</sup> May 2011

*Title of Lecture: Implants materials and their nondestructive testing using electromagnetic methods*

Lecturer: Klára Čápková

Where/Date: Helmholtz Institute of BME, TU RWTH, Aachen, Germany / 25<sup>th</sup> May 2011

*Title of Lecture: Modelling of physiological processes by means of electric equivalent circuits*

Lecturer: Ivo Čáp

Where/Date: Helmholtz Institute of BME, TU RWTH, Aachen, Germany / 24<sup>th</sup> May 2011

*Title of Lecture: Influence of electromagnetic field on living structures – thermal and non-thermal effects*

Lecturer: Ivo Čáp

Where/Date: Helmholtz Institute of BME, TU RWTH, Aachen, Germany / 25<sup>th</sup> May 2011

*Title of Lecture: Medical implants investigation using non-destructive testing*

Lecturer: Tatiana Strapáčová

Where/Date: TRANSCOM 2011: 9<sup>th</sup> European conference of young research and scientific workers, Žilina / 27. June 2011

### 6.2 Membership in International Institutions/Committees

Klára Čápková	- International Society COMPUMAG, Southampton, UK
	- Editorial Board of the international scientific journal Advances in Electrical and Electronic Engineering, ISSN 1804-3119, Ostrava, Czech Republic

- Scientific Committee of the international scientific conference Trends in Biomedical Engineering, 2011, Rožnov pod Radhoštěm, Czech Republic
  - Scientific Committee of the international scientific conference Advanced Methods of the Theory of Electrical Engineering, 2011, Klatovy, Czech Republic
- Ivo Čáp
- Scientific Board of the Pedagogical Faculty, University of Hradec Králové, Hradec Králové, Czech Republic
  - Branch Committee for PhD. study field "Theory of Education of Physics", Pedagogical Faculty, University of Hradec Králové, Czech Republic
  - Branch Committee for PhD. study field "Theory of Education of Physics", Faculty of Science, University of Ostrava, Czech Republic
  - Editorial Board of the journal Československý časopis pro fyziku, Academy of Sciences of CR, Prague, Czech Republic
  - Editorial Board of the journal ARNICA, University of West Bohemia, Plzeň, Czech Republic
  - Independent expert of EC – DG R&D, evaluation of projects under FP7 – Marie Curie, 10<sup>th</sup>-16<sup>th</sup> April 2011, Brussels, Belgium
  - International Board of the EUSO (European Union Science Olympiad), Dublin, Ireland
  - International Board of the IPhO 2011 (International Physics Olympiad), Bangkok, Thailand
  - Scientific Committee of the international scientific conference Trends in Biomedical Engineering, 2011, Rožnov pod Radhoštěm, Czech Republic
  - Program Committee of conference Modern Trends in Preparation of Physics' Techars 5 – Teaching of Physics in the Context of Requisites of Modern Society, 2011, Plzeň, Czech republic
- Ladislav Janoušek
- Japanese Society for Non-Destructive Inspection, Tokyo, Japan
  - Program Committee of the 7<sup>th</sup> Framework Programme – Regions of Knowledge, Research Potential, Brussels, Belgium

### 6.3 Membership in National Institutions/Committees

- Klára Čápková
- Editorial Board of the international scientific journal Journal of Electrical Engineering, ISSN 1335-3632, Bratislava
  - Scientific Board of Jessenius Medical Faculty CU, Martin
  - Branch Committee for the PhD. study field "Theory of Electrical Engineering", FEI STU, Bratislava
  - Branch Committee for the PhD. study field "Medical Biophysics", Jessenius Medical Faculty CU, Martin
  - Branch Committee for the PhD. study field "Bionics and Biomechanics", FME TU, Košice
  - PhD. supervisor in the study field "Bionics and Biomechanics", FME TU, Košice
  - PhD. supervisor in the study field "Biomedical Engineering", FME TU, Košice
  - Supervisory Board of the Slovak Medical Society, section of Biomedical Engineering and Medical Informatics, Bratislava
- Ivo Čáp
- Branch Committee for the PhD. study field "Physics of Condensed Matter and Acoustics", Faculty of Science, UKF, Nitra
  - Branch Committee for the PhD. study field "Medical Biophysics", Jessenius Medical Faculty CU, Martin
  - PhD. supervisor in the field "Medical Biophysics", Jessenius Medical

- Faculty CU, Martin
- National coordinator of the European Union Science Olympiad, Ministry of Education, Bratislava
  - Head of the Slovak Committee of Physics Olympiad, Ministry of Education, Bratislava
  - Head of Preparation of the Representation Team for International Physics Olympiad, Ministry of Education, Bratislava
  - Vice-head of the Central Committee of the Slovak Mathematics and Physics Association, Bratislava
  - Central Council of the Academy of Education, Bratislava
  - Committee of the Slovak Medical Society, section of Biomedical Engineering and Medical Informatics, Bratislava
  - Scientific Committee of the conference Physical Education in the Context of Modern Physics, 2011, Ružomberok
- Ladislav Janoušek - FP7 support system for specific programme Regions of Knowledge, Research Potential, Ministry of Education, Bratislava
- Vilibalda Darmová - Slovak Medical Society, section of Biomedical Engineering and Medical Informatics, Bratislava
- Zuzana Pšenáková - Slovak Medical Society, section of Biomedical Engineering and Medical Informatics, Bratislava

#### 6.4 Membership in University Boards

- Klára Čápková -
- Scientific Board of the Faculty of Electrical Engineering
  - College of the Dean of the Faculty of Electrical Engineering
  - Academic Senate of the Faculty of Electrical Engineering
  - Main Guarantee of the PhD. Degree (3<sup>rd</sup> grade) study field "Theory of Electrical Engineering", Faculty of Electrical Engineering
  - Main Guarantee of the procedures to habilitate and to inaugurate in the study field "Theory of Electrical Engineering", Faculty of Electrical Engineering
  - Head of the Branch Committee for the PhD. study field "Theory of Electrical Engineering", Faculty of Electrical Engineering
  - Branch Committee for the PhD. study field "Marginal States of Materials", Faculty of Mechanical Engineering
  - Administrative council of KAP, Faculty of Electrical Engineering
  - Scientific Committee of the TRANSCOM 2011 conference
  - PhD. supervisor in the study field „Theory of Electrical Engineering”, Faculty of Electrical Engineering
- Ivo Čáp
- Scientific Board of the Faculty of Electrical Engineering
  - Scientific Board of EDIS publishing of the University of Žilina
  - Main Guarantee of the Bachelor and the Master Degree (1<sup>st</sup> and 2<sup>nd</sup> grade) study field "Biomedical Engineering", Faculty of Electrical Engineering
  - Branch Committee for the PhD. study field "Theory of Electrical Engineering", Faculty of Electrical Engineering
  - PhD. supervisor in the study field „Theory of Electrical Engineering”, Faculty of Electrical Engineering
- Ladislav Janoušek
- Scientific Board of the Faculty of Electrical Engineering
  - Co-Guarantee of the PhD. Degree (3<sup>rd</sup> grade) study field "Theory of Electrical Engineering", Faculty of Electrical Engineering
  - Co-Guarantee of the procedures to habilitate and to inaugurate in the study field "Theory of Electrical Engineering", Faculty of Electrical Engineering
  - Branch Committee for the PhD. study field "Theory of Electrical

- Engineering”, Faculty of Electrical Engineering
- PhD. supervisor in the study field „Theory of Electrical Engineering”, Faculty of Electrical Engineering
  - Scientific Committee of the TRANSCOM 2011 conference
- Milan Smetana
- Organizing Committee of the TRANSCOM 2011 conference
  - Executive council of KAP, Faculty of Electrical Engineering

## 6.5 Awards

- “Exceptional Study Award” awarded by the Scientific Committee of the international scientific conference Trends in Biomedical Engineering 2011 for the presentation of a contribution entitled *Cerevisiae growth regulation via exogenous low frequency electromagnetic fields*: Ján Barabáš,
- “Exceptional Study Award” awarded by the Scientific Committee of the international scientific conference Trends in Biomedical Engineering 2011 for the presentation of a contribution entitled *Possibility of cells bioelectric properties evaluation using eddy currents*: Roman Radil,
- “Diploma” awarded by the Program Committee of the 15<sup>th</sup> International Student Conference on Electrical Engineering POSTER 2011 for the work *Proliferative response of two different Saccharomyces Cerevisiae strands to extremely low frequency electromagnetic fields*: Ján Barabáš,
- “First Place Award” gained at the PhD. level of the Student Scientific Competition, Faculty of Electrical Engineering, University of Žilina: Ján Barabáš

## 7 Publications

### Journals indexed in a world-wide database (Thomson Scientific Master Journal List or SCOPUS)

- [1] ČÁP, Ivo – BARABÁŠ, Ján: Low frequency electromagnetic fields: friend or foe? In: *Communications*, Vol. 13, 2011, No. 1, ISSN 1335-4205, p. 13-17. (in English)
- [2] RADIL, Roman – BARABÁŠ, Ján: Simulation of low frequency electromagnetic field effect on cell membrane channels model. In: *Communications*, Vol. 13, 2011, No. 1, ISSN 1335-4205, p. 18-21. (in English)
- [3] CZIPPELOVÁ, Barbora – GOMBÁRSKA, Daniela: Modelling of arterial bifurcation by means of electromechanical model with distributed parameters. In: *Communications*, Vol. 13, 2011, No. 1, ISSN 1335-4205, p. 22-26. (in English)
- [4] STRAPÁČOVÁ, Tatiana – ČÁPOVÁ, Klára – SMETANA, Milan: Biomaterials inhomogeneities detection by electromagnetic methods. In: *Communications*, Vol. 13, 2011, No. 1, ISSN 1335-4205, p. 32-36. (in English)
- [5] GÁLA, Michal – BABUŠIAK, Branko – NOVÁK, Vilém: Automatic creation of hypnogram. In: *Communications*, Vol. 13, 2011, No. 1, ISSN 1335-4205, p. 47-50. (in English)
- [6] DOBRUCKÝ, Branislav – BEŇOVÁ, Mariana – FRÍVALDSKÝ, Michal – PRAŽENICA, Michal: Choosing modulation strategies for 2-stage combine LLC- and direct converter-modelling, simulation, application. In: *Communications*, Vol. 13, 2011, No. 2A, ISSN 1335-4205, p. 25–31. (in English)
- [7] GOMBÁRSKA, Daniela – CZIPPELOVÁ, Barbora – ČÁP, Ivo: The investigation of terminal segment effect on blood pressure propagation patterns in cardiovascular system models. In: *Communications*, Vol. 13, 2011, No. 2A, ISSN 1335-4205, p. 55-60. (in English)
- [8] JANOUŠEK, Ladislav – SMETANA, Milan: Uncertainty in depth evaluation of partially conductive cracks from eddy current testing signals. In: *Communications*, Vol. 13, 2011, No. 2A, ISSN 1335-4205, p. 55-60. (in English)

- [9] STRAPÁČOVÁ, Tatiana – ČÁPOVÁ, Klára – JANOUŠEK, Ladislav: Artificial heart valve inspection using eddy current techniques. In: *Communications*, Vol. 13, 2011, No. 2A, ISSN 1335-4205, p. 83-86. (in English)
- [10] BEŇOVÁ, Mariana – DOBRUCKÝ, Branislav: Methodological approach to steady-state and transient investigation of electric circuits using numerical infinite series of two-phase system. In: *Przegląd Elektrotechniczny (Electrical review)*, Vol. 87, 2011, No. 5, ISSN 0033-2097, p. 6-8. (in English)
- [11] GOMBÁRSKA, Daniela – SMETANA, Milan: Wavelet based signal analysis of pulsed eddy current signals. In: *Przegląd Elektrotechniczny (Electrical review)*, Vol. 87, 2011, No. 5, ISSN 0033-2097, p. 37-39. (in English)
- [12] JANOUŠEK, Ladislav – SMETANA, Milan – ALMAN, Marcel: Interactions of partially conductive cracks with eddy currents in non-destructive evaluation. In: *Przegląd Elektrotechniczny (Electrical review)*, Vol. 87, 2011, No. 5, ISSN 0033-2097, p. 59-61. (in English)
- [13] STRAPÁČOVÁ, Tatiana – ČÁPOVÁ, Klára: Single leg fracture in artificial heart valve – electromagnetic detection of impedance changes. In: *Przegląd Elektrotechniczny (Electrical review)*, Vol. 87, 2011, No. 5, ISSN 0033-2097, p. 166-168. (in English)
- [14] SMETANA, Milan – JANOUŠEK, Ladislav: Transient analysis in pulsed eddy current evaluation of conductive materials. In: *Acta Technica ČSAV*, Vol. 56, 2011, No. 1, ISSN 0001-7043, p. 11-21. (in English)
- [15] DOBRUCKÝ, Branislav – BEŇOVÁ, Mariana – KAŠČÁK, Slavomír: Transient analysis and modelling of 2nd- and 4th-Order LCLC filter under non-symmetrical control. In: *Electronics and Electrical Engineering*, 2011, No. 5, ISSN 1392-1215, p. 89-94. (in English)

#### Other Reviewed Foreign Journals

- [16] BEŇOVÁ, Mariana – DOBRUCKÝ, Branislav – POKORNÝ, Michal: Methodology approach using harmonic synthesis as simulation method for investigation of power network with non-linear loads. In: *Journal of Energy and Power Engineering*, Vol. 4, 2010, No. 11, ISSN 1934-8975, p. 36-43. (in English)
- [17] DOBRUCKÝ, Branislav – BEŇOVÁ, Mariana – SZYCHTA, Elżbieta: Design procedure for LCTLC converter. In: *Journal Logistyka*, 2011, No. 6, ISSN 1231-5478, p.705-710. (in English)
- [18] DARMOVÁ, Vilibalda: Influence of wind power plants' operation on biological systems and human organism. In: *ETM – Elektrotechnický magazín*, Vol. 21, 2011, No. 1, ISSN 1210-5422, p. 48-49. (in Slovak)

#### Other Reviewed Slovak Journals

- [19] BEŇOVÁ, Mariana – DOBRUCKÝ, Branislav – MARČOKOVÁ, Mariana: Modelling of the 2nd and the 4th order resonant filters considering non-linearities. In: *APLIMAT – Journal of Applied Mathematics*, Vol. 4, 2011, No. 4, ISSN 1337-6365, p. 1133-1140. (in English)

#### Papers in proceedings of the world congress/conference published in prestigious foreign publisher such as Springer, Kluwer, Elsevier, John Wiley etc., or published by world-wide reputable scientific institutions such as IFAC, IFIP, IEEE, ACM, IET, SPIE, or listed in Web of Science

- [20] JANOUŠEK, Ladislav – SMETANA, Milan – ALMAN, Marcel: Decreasing uncertainty in size estimation of stress corrosion cracking from eddy-current signals. In: *Studies in Applied Electromagnetics and Mechanics, Electromagnetic Nondestructive Evaluation (XIV)*, Ed.: Tomasz Chady, Stanislaw Gratkowski, Toshiyuki Takagi, Satish S. Udpa, Vol. 35, 2011, ISBN 978-1-60750-749-9, p. 53-60. (in English)
- [21] SMETANA, Milan – JANOUŠEK, Ladislav – ČÁPOVÁ, Klára – MICHNIAKOVÁ, Mária: Pulsed eddy current testing – application to defect evaluation. In: *Studies in Applied Electromagnetics and Mechanics, Electromagnetic Nondestructive Evaluation (XIV)*,

- Ed.: Tomasz Chady, Stanislaw Gratkowski, Toshiyuki Takagi, Satish S. Udpa, Vol. 35, 2011, ISBN 978-1-60750-749-9, p. 233-240. (in English)
- [22] STRAPÁČOVÁ, Tatiana – ČÁPOVÁ, Klára – JANOUŠEK, Ladislav – SMETANA, Milan: Artificial heart valve testing using electromagnetic method. In: *Studies in Applied Electromagnetics and Mechanics, Electromagnetic Nondestructive Evaluation (XIV)*, Ed.: Tomasz Chady, Stanislaw Gratkowski, Toshiyuki Takagi, Satish S. Udpa, Vol. 35, 2011, ISBN 978-1-60750-749-9, p. 296-301. (in English)
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## 8 Contact Address

Department of Electromagnetic  
and Biomedical Engineering  
Faculty of Electrical Engineering  
University of Žilina  
Univerzitná 1, 010 26 Žilina  
Slovak Republic  
Phone: +421-41-513 2101  
E-mail: [ktebi@fel.uniza.sk](mailto:ktebi@fel.uniza.sk)  
www: <http://fel.uniza.sk/ktebi>

Katedra teoretickej elektrotechniky  
a biomedicínskeho inžinierstva  
Elektrotechnická fakulta  
Žilinská univerzita v Žiline  
Univerzitná 1, 010 26 Žilina  
Slovenská republika

## DEPARTMENT OF MECHATRONICS AND ELECTRONICS

### 1 General Information

Department of Mechatronics and Electronics (KME) was founded in January 2005 as a result of the restructuring process of the Faculty of Electrical Engineering of the University of Žilina, which was driven by dynamic changes in the nature of industrial production in Slovakia. The development of automotive and electronic industries, including their supporting companies was significant. Some industry firms, such as Power-One Ltd. in Dubnica nad Vahom, began with the creation of research teams and departments, causing significant need for human resources - highly skilled professionals in mechatronics and electronics, including power and automotive applications. Their training in bachelor, master, and doctorate (PhD.) level of university studies has become the main task of Department of Mechatronics and Electronics, which in December 2011 completed the sixth year of its existence.

Like the previous years, the last year could be considered as a very successful one. Within the year the updating of laboratory equipment in the building AB was completed. Significant progress has been made in building of centers of excellence laboratories, specifically undertaken in the project CEEX1 - Activity 1.1 and 3.2

In the last year the research activity of the Department has achieved a significant increasing implemented by means of grant projects. Department staff participated in two international and eighteen national projects. Centers of Excellence CEEX2 and CEKR2 have been built within the frame of which the Department has cooperated with several prestigious Slovak institutions (SAS Košice, The Technical University of Košice and Jesenius Faculty of Medicine of the Comenius University in Martin). These projects represent a very significant support to research which has been done in our Department.

In the year 2011 the Department involves thirteen members of educational staff, six research workers, sixteen internal PhD students and eleven external PhD students. From the point of view of internal structure it has been divided into two divisions. The first one is focused on power- and applied electronics, the second one is operating in the field of mechatronics and industry automation.

The Department provides educational process at all three levels of the university study. The bachelor degree is covered by the accredited course of study for Electrical Engineering (specialization in Mechatronic Systems). Master degree includes the accredited course of study for Power Electronic Systems (in Power Electronics specialization and Mechatronic and Automotive Systems specialization). In doctorate study the department staff participated in providing training courses in Powerline Electronics, Automation and Telecommunications.

Within the frame of educational pedagogical operation the Department has been providing education of electronics, mechatronics, micro-computer systems involving industrial controllers and power electronics at the Faculty of Electrical Engineering, and also at further faculties of the University of Zilina. Such education has been dedicated for different study branches and specializations in the bachelor, magisterial and doctoral studies, both in internal and external ones.

The Department also has organized and provided research and development, expertizing and contracts, and develops publication activity in the field of electronics, control systems, mechatronics and power electronics mainly. Further education is provided by the Department in the field of power electronic systems, microcomputer control systems, industrial controllers and programmable logic systems.

Professional activities of the Department have been applied and disseminated on creation and operation of quality and reliable electronic devices and systems, application of programmable logic areas in design of electronic systems, reconfigurable circuits study

as well as diagnostics and analyzing of the failures using image analysis. Topology optimizing for power semiconductor converters and their electro-magnetic compatibility belongs to main activities of the Department.

In present time the Department operates with six laboratories dedicated for pedagogical operation, including final projects, final and master thesis providing. Beside above mentioned labs the Department offers for utilizing three high-tech workplaces dedicated for research and development activities and to experimental part of PhD study providing. It deals with the laboratory of power electronics, the laboratory of digital image processing and laboratories of digital signal processors and industrial programmable logic controllers.

## 2 Staff of the Department

Head of the Department	: Pavol Špánik
Vice-head of the Department	: Branislav Dobrucký
Secretary for Education	: Anna Kondelová
Administrative Support	: Andrea Prandová

### 2.1 Sections of the Department

#### 2.1.1 Section of Electronics and Control Systems

Head of the Section	: Jozef Čuntala
Professors	: Branislav Dobrucký, Pavol Špánik
Visiting Professors	: Alfio Consoli
Associate Professors	: Jozef Čuntala, Miroslav Hrianka, Libor Hargaš, Jozef Budaj, Jozef Kuchta
Research Fellows	: Peter Drgoňa, Michal Frivaldský, Dušan Koniar
Senior Lecturers (with PhD)	: Rastislav Pavlanin, Rastislav Havrila
Senior Lecturers (without PhD)	: Ivan Kožehuba, Jozef Lakatoš, Peter Šindler, Anna Kondelová

#### 2.1.2 Section of Mechatronic Systems and Industry Automation

Head of the Section	: Fedor Kállay
Professors	: Fedor Kállay
Associate Professors	: Pavel Pavlásek
Research Fellows	: Marek Paškala
Senior Lecturers (with PhD)	: Anna Simonová

#### 2.1.3 Postgraduate Students

Internal (full-time)	: Michal Praženica, Ondrej Hock, Jozef Kandráč, Stanislav Štofan, Ján Kašša, Martin Priečinský, Miloslav Kolpach, Peter Hurtuk, Roman Radvan, Andrej Rybovič, Tomáš Kapusta, Jozef Sedlák, Slavomír Kaščák, Peter Čuboň (from 2 <sup>nd</sup> September 2011), Marek Valčo (from 2 <sup>nd</sup> September 2011), Jozef Šedo (from 2 <sup>nd</sup> September 2011)
External (part-time)	: Peter Šindler, Anna Kondelová, Marek Paškala, Marcel Pčola, Peter Čerňan, Peter Jeck, Erika Polčanová, Ing. Zuzana Ridzoňová, Ing. Daniela Hívešová, Ing. Marián Novota, Anna Holásková

### 3 Teaching

#### 3.1 Courses in Bachelor and Master Degree Programmes

##### 3.1.1 Bachelor Degree Programmes

Code Title	Lessons-Seminars-Exercises		Teachers
	Semester	hours/week	
<i>Courses at the Faculty of Electrical Engineering</i>			
31302 Electronics I	3	2-0-3	Čuntala
31300 Distributed Systems in Industry Automation	3	2-0-2	Kállay
31402 Automatic Regulation 1	4	2-2-0	Simonová
31413 Electric Light and Heat	4	2-1-1	Pavlásek
31414 Electromagnetic Compatibility	4	2-2-0	Špánik
31415 Electronics II	4	2-0-3	Hrianka
31426 Measurement of Non-Electric Parameters	4	2-0-2	Kállay
31427 Power Supplies	4	2-0-1	Špánik
31430 Computers in Industrial Automation	4	2-0-2	Kállay
31502 Power Electronics	5	3-1-2	Špánik
31511 Microprocessor Technology	5	3-0-2	Čuntala
31524 Logical Circuits	5	3-0-2	Hrianka
31528 Multimedia Technology	5	2-0-1	Pavlásek
31542 Image Processing and Analysis	5	2-0-2	Hrianka
31552 Computer and Office Technique	5	2-0-1	Pavlásek
31557 Automatic Regulation 2	5	2-1-1	Simonová
31628 Power Semiconductor Systems	6	3-1-1	Špánik
31634 Bachelor Project Mechatronic Systems	6	0-0-6	Špánik

##### *Courses at the Faculty of Mechanical Engineering*

2B092 Drives of Mechatronic Systems	5	2-0-1	Špánik
2B127 Electronics	6	2-0-2	Čuntala

##### 3.1.2 Master Degree Programmes

Code Title	Lessons-Seminars-Exercises		Teachers
	Semester	hours/week	
<i>Courses at the Faculty of Electrical Engineering</i>			
32107 Electromagnetic Compatibility in Electr.	1	2-2-0	Špánik
32111 Information and Industrial Networks	1	2-0-2	Kállay
32117 Design of ASIC	1	1-3-0	Čuntala
32119 Computers in Industrial Automation 2	1	2-0-2	Kállay
32126 Control of Electric actuators	1	3-1-1	Dobrucký
32129 Theory of Automatic Control 1	1	2-1-1	Simonová
32136 Power Semiconductor Converters	1	3-0-3	Špánik
32200 Analysis and Synthesis of PE Circuits	2	2-2-0	Špánik
32211 Measurement and Digit. Data Processing	2	2-2-0	Pavlásek
32216 Microprocessors, Microcomputers and DSP	2	2-0-3	Dobrucký
32233 Microproc. and Microcomputer Systems	2	3-0-3	Dobrucký
32236 Theory of Automatic Control 2	2	2-1-1	Simonová
32300 Power Electronics Applications in ET & EE	3	3-0-1	Dobrucký
32324 Design and Construction of PE Systems	3	2-2-0	Špánik

32325 Design of ASIC	3	1-3-0	Čuntala
32330 Semiconductor Sensors	3	2-2-0	Kožehuba
			Lakatoš
32334 Semestral Project	3	0-4-0	Špánik
32341 Virtual Instrumentation	3	2-0-2	Hargaš
32402 Diploma Thesis PES			
32404 Diploma Seminar	4	0-2-0	Špánik
32405 Discrete Control of Power Systems	4	6-0-6	Dobrucký
32406 Dispatching Systems	4	4-0-4	Kállay
32416 Industrial Informatics	4	4-0-4	Kállay

#### Courses at the Faculty of Mechanical Engineering

2N125 Electronic Control Elements	1	2-2-0	Špánik
2N244 Exploitation of Computer Networks	1	2-0-2	Kállay
2N246 Microcomputer Technics	1	2-0-2	Čuntala
2N014 Information and Industry Networks	2	2-0-2	Kállay
2N125 Electronic Control Elements	2	2-2-0	Špánik
2N140 Converter Drives	3	2-2-0	Špánik
2N141 Control Microcomputers	3	2-2-0	Dobrucký

#### Courses for Foreign Students – LLP/Erasmus Program

Course / Teacher / Student of University

- 31628 Power Semiconductor Systems, (*Dobrucký*),  
 Pedro Miguel Costa Monteiro Marques, Universidade do Porto, PT  
 Miguel Fonseca Lage, Universidade do Porto, PT
- 31300 Distributed Systems in Industry Automation, (*Dobrucký*),  
 Salih Cemil Cetin, Uludag University, TR  
 Heval Kalmis, Uludag University, TR  
 Santiago Perez Gomez, Universidad Cantabria, ES
- 31511 Microprocessor Technology (*Čuntala, Kondelová*),  
 Ersin Altay, Uludag University, TR  
 Heval Kalmis, Uludag University, TR
- 31542 Image Processing and Analysis (*Hrianka*),  
 Salih Cemil Cetin, Uludag University, TR
- 32136 Power Semiconductor Converters, (*Dobrucký*),  
 Agostinho Manuel Afonso da Rocha, Universidade do Porto, PT
- 32405 Discrete Control of Power Systems, (*Dobrucký*),  
 Salih Cemil Cetin, Uludag University, TR  
 Heval Kalmis, Uludag University, TR

## 4 Educational, Research and Scientific Projects

### 4.1 Internal Research Projects

*Title: Sophistic-, electronic and mechatronic systems*

Coordinator: Pavol Špánik

Co-operators: Branislav Dobrucký, Pavel Pavlásek, Fedor Kállay, Anna Simonová, Michal Frivaldský, Peter Drgoňa, Rastislav Pavlanin, Marek Paškala, Roman Radvan, Jozef Čuntala, Anna Kondelová, Ivan Kožehuba, Peter Šindler, Jozef Lakatoš, Libor Hargaš, Dušan Koniar

## 4.2 National Projects

### 4.2.1 Research Projects Funded by the Scientific Grant Agency of the Slovak Republic (VEGA)

*Title: Research of Topology and Control of Power Electronic Supply System with Single-Phase HF Input and Two-Phase Orthogonal Output for Two-Phase SM/IM Electrical Motors (VEGA 1/0474/09)*

Coordinator: Branislav Dobrucký

Co-operators: Pavol Špánik, Pavel Pavlásek, Anna Simonová, Peter Šindler, Marek Paškala, Rastislav Pavlanin, Peter Jeck, Ján Kašša, Michal Praženica, Peter Drgoňa, Slavomír Kaščák

*Title: The Development of Mechanical Subsystem of Tripod and Hybrid Kinematic Structure for Application in the Area of Production Machines and Robots (VEGA 1/0207/10)*

Coordinator: Viera Poppeová

Co-operator: Peter Šindler

*Title: Research of Adaptive Multi-Tank Power System for Renewable Energy Sources (VEGA 1/0943/11)*

Coordinator: Pavol Špánik

Co-operator: Branislav Dobrucký, Fedor Kállay, Jozef Čuntala, Miroslav Hrianka, Libor Hargaš, Peter Šindler, Anna Kondelová, Ivan Kožehuba, Marek Paškala, Michal Frivaldský, Peter Drgoňa, Dušan Koniar, Anna Simonová, Peter Hurtuk, Jozef Kandráč, Martin Priečinský

*Title: Modelling and Simulation of Environment Dynamic Interaction of Driver–Car–Transport Instantiation (VEGA 01/1099/11)*

Coordinator: Mikuláš Alexík, FRI KTK

Deputy person: Branislav Dobrucký

### 4.2.2 Projects Funded by the Cultural & Education Grant Agency (KEGA)

*Title: The Development of Specialized Unit for Teaching of Parallel Kinematic Structures Application in the Area of Production Machines and Robots (KEGA 086-051ŽU-4/2010)*

Coordinator: Viera Poppeová

Co-operator: Peter Šindler

### 4.2.3 Research Projects Funded by the Slovak Research and Development Agency (APVV)

*Title: Galvanotechnological System with Synchronous Rectifier (APVV VMSP-P-0085-09)*

Coordinator: Ján Rehuš, Jozef Čuntala

Co-operators: Pavel Pavlásek, Marek Paškala, Libor Hargaš, Peter Hurtuk, Peter Drgoňa, Roman Radvan, Michal Frivaldský

*Title: High Frequency Power Electronic Converters (APVV LPP-0366-09)*

Coordinator: Pavol Špánik

Co-operators: Jozef Kandráč, Martin Priečinský

*Title: Research and Development of the Small Power Drives with Two-phase Motors (APVV LPP-0366-09)*

Coordinator: Pavel Záskalický TUKE, Branislav Dobrucký

Co-operators: Michal Frivaldský, Peter Drgoňa, Michal Praženica, Ján Kašša, Slavomír Kaščák



#### 4.2.4 Projects of European Structural Funds

*Title: CEEX1 (ITMS 26220120003) Centre of Power Electronic Systems and Materials for their Components, Operational Program Research and Development*

Coordinator: Pavol Špánik, Branislav Dobrucký

Co-operators: Jozef Čuntala, Miroslav Hrianka, Peter Šindler, Peter Drgoňa, Pavel Pavlásek, Anna Simonová, Marek Paškala, Libor Hargaš, Michal Frivaldský, Andrea Prandová, Ján Davidík, Michal Praženica

*Title: CEEX2 (ITMS 26220120046) Centre of Power Electronic Systems and Materials for their Components, Operational Program Research and Development II*

Coordinator: Pavol Špánik, Branislav Dobrucký

Co-operators: Jozef Čuntala, Peter Šindler, Peter Drgoňa, Anna Simonová, Marek Paškala, Libor Hargaš, Michal Frivaldský, Pavel Pavlásek, Rastislav Pavlanin

*Title: CEKR1 (ITMS 2622010004) Centre for Experimental and Clinical Respiriology I*

Coordinator: Miroslav Hrianka

Co-operator: Libor Hargaš, Dušan Koniar

*Title: CEKR2 (ITMS 2622010034) Centre for Experimental and Clinical Respiriology II*

Coordinator: Miroslav Hrianka

Co-operator: Libor Hargaš, Anna Simonová, Stanislav Štofán

*Title: MKC (ITMS 26220220019) Ciliary Kinetics Measurement of Respiratory Tractus*

Coordinator: Miroslav Hrianka

Co-operator: Libor Hargaš, Dušan Koniar

*Title: Systemisation of Advanced Technology and Knowledge Transfer between Industrial Sphere and University Environment (ITMS 26110230004)*

Coordinator: Milan Šaga

Co-operator: Pavol Špánik, Branislav Dobrucký, Michal Frivaldský, Jozef Čuntala

*Title: Flexible and Attractive Education at University of Žilina for Needs of Labour Market, and Knowledge Society (ITMS 26110230005)*

Coordinator: Renáta Švarcová

Co-operator: Pavol Špánik, Branislav Dobrucký, Pavel Pavlásek, Libor Hargaš, Jozef Čuntal

*Title: Research of High-Economic components of Electric Drive Systems of Driving Traction Vehicles and Urban Mass Transportation Vehicles (ITMS 26220220078)*

Coordinator: Pavol Špánik

Co-operator: Fedor Kállay, Peter Šindler, Michal Frivaldský, Anna Kondelová, Peter Drgoňa, Marek Paškala

*Title: The Development of Parallel Kinematic Structures Prototypes for Application in the Area of Production Machines and Robots (ITMS 26220220046)*

Coordinator: Viera Poppeová

Co-operator: Peter Šindler

*Title: Applied Research and Development of Innovative Energy Resources for Ultra High Pressure Pulses (ITMS 26220220088)*

Coordinator: Pavol Rafajdus

Co-operator: Branislav Dobrucký

### 4.3 International Projects

#### 4.3.1 CEEPUS II Projects

*Title: From preparation to development, implementation and utilization of joint programs in study area of Production Engineering – contribution to higher flexibility and mobility of students in central European region (CII-SK-0030-06-1011)*

Coordinator: Ivan Kuric

Co-operators: Fedor Kállay

#### 4.3.2 Custom-made Research Projects

*Title: Analysis of heat fields in power electronic systems (P-103-0007/08)*

Customer: Panasonic Electronic Devices Europe GmbH

Coordinator: Pavol Špánik

Co-operators: Jozef Čuntala, Branislav Dobrucký, Jozef Lakatoš, Libor Hargaš, Michal Frivaldský, Peter Drgoňa, Roman Radvan

## 5 Co-operation

### 5.1 Co-operation Partners in Slovakia

EVPÚ a.s Nová Dubnica

Panasonic Electronic Devices Slovakia, s.r.o., Trstená

NES Nová Dubnica

Power-One, Dubnica nad Váhom

Siemens s.r.o., Bratislava, Žilina

Vedeckotechnologický park, Žilina

LJF Martin, UK Bratislava

ABB Slovakia, Bratislava

DataTherm, s.r.o. Žilina

Robotec s.r.o. Sučany

CONTINENTAL MATADOR s.r.o. Púchov

HAGARD: HALL a.s. Nitra, Žilina

IPESOFT s.r.o. Žilina

Považská cementáreň a.s., Ladce

Energo controls s.r.o. Žilina

ControlTech, s.r.o. Trnava

Schneider Electric Slovakia, s.r.o., Bratislava, Žilina

MACRO, s.r.o., Žilina

SSE, a.s. Žilina

Súkromná zvaračská škola, Žilina

Department of el. engineering, mechatronics and industrial engineering, FEI TU Košice

Department of mechatronic systems, FM TUAD, Trenčín

Department of automation and regulation, FEI STU, Bratislava

Department of electric machines and apparatus, FEI STU, Bratislava

INA Kysuce, a.s. Kysucké Nové Mesto

KIA Motors, s.r.o. Žilina

GRANIT, s.r.o. Žilina

AAUTO, s.r.o. Žilina

VIP AUTO, s.r.o. Žilina

TEAM DC, Bratislava

GS1 Slovakia, Žilina

Htest Slovakia, Banská Bystrica

SSC, Bratislava

NDS, Bratislava  
SEMIKRON s.r.o. Vrbové

## 5.2 International Co-operation Partners

Università degli studi di Catania, IT, DIEES, Prof. Alfio Consoli  
Panasonic Electronic Devices Co., Ltd., Kadoma, JPN  
Panasonic Electronic Devices Europe GmbH, Lüneburg, DE  
Politecnico di Bari, IT, DEE, Prof. Francesco Cupertino  
University of Nottingham, UK, Prof. Greg ASHER, Prof. Pat Wheeler  
University of Picardie – Jules Verne, Amiens, FR, Prof. Gérard-André Capolino  
National University of Ireland, Dublin, IRL, Prof. Annroi de Paor  
University of Porto, PT, Prof. Maciel Barbosa  
Technische Universität Dresden, DE, Dr. Peter Büchner  
Technische Universität Darmstadt, DE, Prof. Andreas Binder  
Technikum Wien, AT, Prof. Felix Himmelstoss  
Technische Universität Bochum, DE, Prof. Andreas Steimel  
National Instruments Czech Republic, s.r.o., CZ, Peter Brieška  
Technical University RWTH Aachen, DE, Prof. Blazek Vladimir  
Politechnika Radomska, PL, Prof. Miroslav Luft, Assoc. Prof. Elzbieta Szychta  
XILINX USA, University program  
Humusoft s.r.o. Praha, CZ, Karel Bittner  
TU – VŠB Ostrava, CZ, Prof. Pavel Brandstetter, Prof. Petr Chlebiš  
FAIRCHILD Semiconductor - Power Franchise, EU  
FreeScale s.r.o., Rožňov pod Radhoštěm, CZ  
Rockwell Automotion s.r.o., Praha, CZ  
Technological & Cultural Park of Lavrion, GR  
TIM Science Park, Timisoara, RO  
University Ioan Slavici, Timisoara, RO  
The University of Strathclyde, Glasgow, UK

## 5.3 Visitors to the Department

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Titus Slavici	TIM Science Park, Timisoara, RO	1 day
Elzbieta Szychta	University of Radom, Poland	4 days
Miroslav Luft	University of Radom, Poland	4 days
Wojciech Jarzyna	Politechnika Lublińska, PL	1 day
Nobuki Itoh	Panasonic, Japan	1 day
Norbert Glapa	Panasonic, DE	5 days
Miho Nishiguchi	Panasonic, Japan	5 days
Hiroshi Takahashi	Panasonic, Japan	1 day
Mahmud Ali Rzig Abdalmula	Univ. of Aljabel Algarbi, Sabrata, Libia	7 days
Vassileios Drakopoulos	Nat. and Kapodistrian Univ. of Athens, EL	1 day

## 5.4 Visits to Foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Miroslav Hrianka	RWTH – Aachen, DE	7 days
Branislav Dobrucký	Jules Verne University, Amiens, FR	6 days
Pavol Špánik	UNICT Catania, IT	10 days
Andrej Rybovič	HTW Dresden, DE DAAD	6 months
Martin Priečinský	Aalto University, Helsinki, FI	4 months
Roman Radvan	Dep. of Electronics, FEI VŠB-TU, Ostrava	1 day
Tomáš Kapusta	Dep. of Electronics, FEI VŠB-TU, Ostrava	1 day

*Participation in Foreign conferences:**Active:*

Branislav Dobrucký	MIC IASTED, Creta, EL	5 days
Branislav Dobrucký	OPSFA, Madrid, ES	6 days
Branislav Dobrucký	LogiTrans, Szczyrk, PL	1 day
Branislav Dobrucký	TRANSCOMP, Politechnika Radomska, Zakopané, PL	2 days
Peter Drgoňa	TRANSCOMP, Politechnika Radomska, Zakopané, PL	1 day
Pavol Špánik	MMMSE 2011, Orlando, FL, USA	5 days
Michal Frivaldský	MMMSE 2011, Orlando, FL, USA	5 days
Peter Drgoňa	MMMSE 2011, Orlando, FL, USA	5 days
Peter Šindler	MOTSP 2011, Bol, Brač, HR	4 days
Michal Frivaldský	TRANSCOM, Praha, CZ	1 day
Slavomír Kaščák	TRANSCOM, Praha, CZ	1 day
Tomáš Kapusta	TRANSCOM, Praha, CZ	1 day
Libor Hargaš	Applied Electronics, ZČU, Plzeň	2 days
Ondrej Hock	Applied Electronics, ZČU, Plzeň	2 days
Michal Frivaldský	Applied Electronics, ZČU, Plzeň	2 days
Peter Hurtuk	Applied Electronics, ZČU, Plzeň	2 days
Stanislav Štofán	11. workshop doktorandov, Ostrava, CZ	1 day
Peter Hurtuk	11. workshop doktorandov, Ostrava, CZ	1 day
Ondrej Hock	11. workshop doktorandov, Ostrava, CZ	1 day
Andrej Rybovič	11. workshop doktorandov, Ostrava, CZ	1 day
Jozef Sedlák	11. workshop doktorandov, Ostrava, CZ	1 day
Miroslav Hrianka	Rudnik's days, Zakpane, PL	3 days
Libor Hargaš	Rudnik's days, Zakpane, PL	3 days
Dušan Koniar	Rudnik's days, Zakpane, PL	3 days

## Paper without presentation:

Pavel Pavlásek	INTED 2011, Valencia, ESP	3 days
Branislav Dobrucký	IMCIC 2011, Orlando, USA	3 days
Branislav Dobrucký	EVER 2011, Monaco	3 days
Branislav Dobrucký	CPEE 2011, Klatovy, CZ	3 days

**6 Other Activities****6.1 Specialized Lectures, Courses Organized by the Department***Title of Lecture/Course: RFID Identifiers*

Customer: GS1 SLOVAKIA, Department of Mechatronics and Electronics, University of Žilina

Lecturer: Pavel Pavlásek

Date: 21<sup>st</sup> November to 25<sup>th</sup> November 2011

*Title of Lecture/Course: Identification of Goods and Services by RFID*

Customer: GS1 SLOVAKIA, Department of Mechatronics and Electronics, University of Žilina

Lecturer: Miroslav Štaffen, Pavel Pavlásek

Date: 25<sup>th</sup> November 2011

*Title of Lecture/Course: Control of Tunnel Operation Distant Education for Operators at the Bôrik Tunnel*

Customer: SSC  
Lecturer: Fedor Kallay  
Date: November 2011

*Competition: The Technical Idea of the Year*

Participants: Secondary school students  
Organizers: Pavol Špánik, Michal Frivaldský, Peter Drgoňa, Peter Šindler, Libor Hargaš  
Date: 23<sup>rd</sup> June 2011

## 6.2 Membership in International Institutions/Committees

- Branislav Dobrucký - Member of IEEE IE Society  
- Member of International Association for Science and Technological Development (IASTED), CA  
- Reviewer for Publishing Company Elsevier, NL  
- Reviewer for EPE journal, Brussels, BE  
- Steering Programme Committee of International MIC IASTED 2007-2011 Conference  
- Steering Programme Committee of International WMC 2011 Conference, Orlando, USA
- Pavel Pavlásek - Member of the Editorial Board of the Strojárstvo (Machinery) Journal  
- Member of the Editorial Board of the Inžinierske stavby Journal  
- Member of Brandon Hall Excellence in Learning Technology Awards  
- Expert of FP7 Programme NMP – 2007 – 3.4 – 1  
- Expert of Romanian Ministry of Education, Research and Youth
- Pavol Špánik - Member of IEEE IE Society  
- Member of the Scientific Board of FEI – TU Ostrava, CZ  
- Member of the Electronics Committee, FEI – TU Ostrava, CZ
- Michal Frivaldský - Member of IEEE IE Society  
Peter Drgoňa - Member of IEEE IE Society  
Jozef Kandráč - Student member of IEEE IE Society  
Peter Hurtuk - Student member of IEEE IE Society  
Martin Priečinský - Student member of IEEE IE Society

## 6.3 Membership in National Institutions/Committees

- Branislav Dobrucký - Member of the Common Committee for Electrical Engineering  
- Steering Programme Committee of ALER 2011 Conf.  
- Steering Programme Committee of TRANSCOM 2011 Conf.  
- Member of the Common Committee for Mechatronics
- Pavel Pavlásek - Member of the Commission of Transport and Road Administration port (The Žilina Self-governing region)  
- Member of the Grant Commission for Education and Culture No.2 of the Ministry of Education of Slovak Republic  
- Member of the Commission of the Ministry of Education of Slovak Republic for Selection of the Aid of Candidates from Developing Countries and Compatriots  
- Representative of Regional Assembly of Žilina Self-governing Region  
- Director General of Slovak Road Administration  
- Member of the Supervisory Board of SSE – Distribúcia a.s. Žilina  
- Member of the Supervisory Board of Letisková spoločnosť a.s. Žilina
- Pavol Špánik - Member of the Common Committee for Mechatronics

## 6.4 Membership in University Boards

- Branislav Dobrucký - Member of the Editorial Board of ZU Scientific Journal – Communication – Scientific Letters  
 - Editorial Board of Publication Committee of ZU  
 - Member of the Scientific Board of FEE ZU  
 - Member of the Electrical Engineering Committee, FEE ZU  
 - Member of the Automation and Control Committee – Process Control, FEE ZU
- Pavol Špánik - Member of the Senate ZU  
 - Member of the Academic Senate of FEE ZU  
 - Member of the Scientific Board of FEE ZU  
 - Member of the Electrical Engineering Committee, FEE ZU  
 - Member of the Electrical Engineering Committee, FEI STU Bratislava  
 - Member of the Automation and Control Committee – Process Control, FEE ZU  
 - Member of the Measurement Technique Committee, FEI TU Košice
- Libor Hargaš - Member of the Academic Senate of FEE ZU

## 7 Publications

### Monographs

- [1] HARGAŠ, L., KONIAR, D., ŠTOFAN, S.: *Sophisticated Biomedical Tissue Measurement Using Image Analysis and Virtual Instrumentation*, In: *LabVIEW Practical Applications and Solutions*, Edited by Silviu Folea, Published by InTech Janeza Trdine 9, 51000 Rijeka, Croatia July, 2011, Kapitola 8, pp. 155-180, ISBN 978-953-307-650-8
- [2] DRGOŇA, P., FRIVALDSKÝ, M., SIMONOVÁ, A.: *A New Approach of Control System Design for LLC Resonant Converter*, In: *Matlab for Engineers - Applications in Control, Electrical Engineering, IT and Robotics*, Edited by Karel Perutka Published by InTech Janeza Trdine 9, 51000 Rijeka, Croatia, September 2011, Kapitola 13, pp. 321-338, ISBN 978-953-307-914-1
- [3] MAISNAR, V., STRAUB, J., ADAM, Z., HÁJEK, R., ONDERKOVÁ, A., HRIANKA, M.: *Multiple Myeloma- Educational CD for patients and their relatives*, Editor: HK CREDIT spol.s.r.o., Hradec Králové ISBN. 978-80-86780-45-0 (in Slovak)
- [4] SPIŠIAKOVÁ, M., HRIANKA, M.: *Multiple Myeloma – Multimedial Education Course 2011*, Vydal : Slovak Myeloma Society – Patients Club Biomedical Engineering University of Žilina, Slovakia 2011, ISBN 978-80-554-0318-2

### Books and textbooks

- [5] HRIANKA, M., MASLÁK, A., HARGAŠ, L., KONIAR, D.: *Logic Circuits (Interactive Textbook, Animations and Quizzes on CD-ROM)*. Editor: EDIS - Žilinská univerzita v Žiline, 2011, ISBN 978-80-554-0320-5 (in Slovak)
- [6] SIMONOVÁ, A., DRGOŇA, P., FRIVALDSKÝ, M.: *Automatic Regulation, textbook [Automatická regulácia, vysokoškolská učebnica]*, Editor: EDIS - Žilinská univerzita v Žiline, 2011, 151 pp., ISBN 978-80-554-0381-6 (in Slovak)
- [7] SIMONOVÁ, A.: *Technologies of Process Control [Technológie riadenia procesov]*, (elektronic source), Editor: EDIS - Žilinská univerzita v Žiline, 2011, (CD – ROM), 96 pp., fig., tab., appendixes, ISBN 978-80-554-0438-7 (in Slovak)

### Journals indexed in a world-wide database (Thomson Scientific Master Journal List, Scopus)

- [8] RADVAN, R., DOBRUCKÝ, B., FRIVALDSKÝ, M., RAFAJDUS, P.: *Modelling and Design of HF 200 kHz Transformers for Hard - and Soft-Switching Application*, In:

- Electronics and Electrical Engineering, Kaunas 2011, No.4 (110), pp.7-12, ISSN 1392-1215, Thomson index
- [9] DOBRUCKÝ, B., BEŇOVÁ, M., KAŠČÁK, S.: *Transient Analysis and Modelling of 2nd- and 4th- Order LCLC Filter under Non - Symmetrical Control*, In: Electronics and Electrical Engineering, Kaunas 2011, No. 5, (111), pp.89-94, ISSN 1392-1215, Thomson index
- [10] BEŇOVÁ, M., DOBRUCKÝ, B.: *Methodological approach to steady-state and transient investigation of electric circuits using numeral infinite series of two-phase system*, In: Przegląd Elektrotechniczny 5/2011, ISSN 0033-2097, Thomson index
- [11] HARGAŠ, L., KONIAR, D., ŠTOFAN, S., HRIANKA, M.: *Sophisticated Methods for Tissue Perfusion Evaluated*, In: Communications, 1/2011, pp. 42 – 46, ISSN 1335 – 4205, SCOPUS index
- [12] DOBRUCKÝ, B., BEŇOVÁ, M., FRIVALDSKÝ, M., PRAŽENICA, M.: *Choosing Modulation Strategies for 2 – Stage Combine LLC – and Direct Converter – Modelling, Simulation, Application*, In: Communications, 2A/2011, Volume 13, pp. 25 -31, ISSN 1335-4205, SCOPUS index
- [13] DRGOŇA, P., PRÍKOPOVÁ, A., FRIVALDSKÝ, M., PRIEČINSKÝ, M.: *Simulation Based Method for Design and Application of Digital Control System*, In: Communications, 2A/2011 Volume 13, pp. 32 -37, ISSN 1335-4205, SCOPUS index
- [14] HURTUK, P., PRIEČINSKÝ, M., KONDELOVÁ, A.: *Converter with Synchronous Rectifiers for Electroplating*, In: Communications, 2A/2011, Volume 13, pp. 49 – 54, ISSN 1335-4205, Scopus index
- [15] ŠPÁNIK, P., KANDRÁČ, J., FRIVALDSKÝ, M., DRGOŇA, P.: *Verification of Operation Modes of Designed LLC Resonant Converter*, In: Communications, 2A/2011, Volume 13, pp. 67 – 73, ISSN 1335-4205, Scopus index

#### Journals indexed in EBSCO database (DAVID Publishing, AEEE, ...)

- [16] PRAŽENICA, M., DOBRUCKÝ, B., SEKERÁK, P., KALAMEN, L.: *Design, Modelling and Simulation of Two – Phase Two - Stage Electronic system with Orthogonal Output for Supplying of Two - Phase ASM*, In: Advances in Electrical and Electronic Engineering, Volume 9, number 1, March 2011, pp. 56-64, ISSN 1804-3119, EBSCO index
- [17] PRAŽENICA, M., KAŠŠA, J., SEDLÁK, J.: *Investigation of Power Losses of Two-Stage Two - Phase Converter With Two - Phase Motor*, In: Advances in Electrical and Electronic Engineering, Volume 9, number 2, June 2011 pp. 77-83, ISSN 1804-3119, EBSCO index
- [18] BYSTRICĀNOVÁ, A., RYBOVIČ, A.: *Data Communication Between Programmable Logic Controllers in the Industrial Distribution Applications*, In: Advances in Electrical and Electronic Engineering, Volume 9, number 2, June 2011 pp. 96 -102, ISSN 1804-3119, EBSCO index
- [19] DRGOŇA, P., BOBEK, V., DOBRUCKÝ, B., FRIVALDSKÝ, M.: *Performance Analysis of PMSM Equations Computation*, In: JEPE – Journal of Energy and Power Engineering, Volume 5, Number 1, January 2011, pp. 70 – 74, ISSN 1934 – 8975, EBSCO index

#### Other Reviewed Foreign Journals

- [20] DOBRUCKÝ, B., KAŠŠA, J., ŠPÁNIK, P., PRAŽENICA, M.: *Possibilities of 2-Phase Electronic Converters for Electric Vehicle Drivers*, In: czasopismo Logistyka nr 3/2011, pp. 545 – 550, ISSN 1231 – 5478
- [21] DOBRUCKÝ, B., BEŇOVÁ, M., SZYCHTA, E.: *Design procedure for LCTL C converter*, In: czasopismo Logistyka nr 6/2011, pp. 705 – 710, na nosiči CD1, ISSN 1231 – 5478

- [22] HARGAŠ, L., ŠINDLER, P., ZÁBORSKÝ, L., SIMONOVÁ, A.: *Overhead contact line parameters measurement*, In: časopismo Logistika nr 6/2011, pp. 1357 – 1365, na nosiči CD1, ISSN 1231 – 5478
- [23] PRAŽENICA, M., KAŠČÁK, S., RADVAN, R.: *Simulation and verification of two-stage converter with sinusoidal filter*, In: časopismo Logistika nr 6/2011, pp. 3469 – 3478, na nosiči CD1, ISSN 1231 – 5478

#### Other Reviewed Slovak Journals

- [24] KAPUSTA, T., BORIŠ, M.: *Sources of Electromagnetic Interference in Power Electronic Systems and its Elimination*, In: Elektrotechnika, informatika a telekomunikácie 2011, ročník 17, október 2011 mimoriadne číslo, pp. 134 -137, ISSN 1335- 2547
- [25] KOLPACH, M.: *Rotary Pallet Changer RPC 5025*, In: ai magazine – Časopis o automobilovom priemysle, strojárstve a ekonomike [ai magazine - Journal about automotive industry, machine engineering and economics], 2/2011, Volume 4, May 2011, pp. 63, ISSN 1337-7612 (in Slovak)
- [26] REPKA, L., KOLPACH, M.: *BOST SK a.s. Productivity and Reliability Improvement in Industry*, In: ai magazine – Časopis o automobilovom priemysle, strojárstve a ekonomike [ai magazine - Journal about automotive industry, machine engineering and economics] 3/2011, Volume 4, September 2011, pp. 32, ISSN 1337-7612 (in Slovak)
- [27] REPKA, L., KOLPACH, M.: *Rotary Pallet Changer RPC 5025*, In: Technológie – Časopis firmy BOST SK [Technologies – BOST SK Journal], Volume 9, No 1/2011, ISSN 1337-9429 (in Slovak)
- [28] KOLPACH, M.: *Robotic material machining [Robotické obrábanie materiálov]*, In: Časopis firmy BOST SK - technológie [Technologies – BOST SK Journal], Volume 8, No 2/2010, pp. 12, ISSN 1337- 9429 (in Slovak)
- [29] BEŇOVÁ, M., ABDAMULA, M., DOBRUCKÝ, B.: *Modelling of the 4<sup>th</sup> Order resonant filters LCLC considering non-linearities*, In: APLIMAT 2011, 10<sup>th</sup> International conference, February 1- 4, 2011 Bratislava, Slovak Republic, pp. 1133 -1140, ISSN 1337 - 6365

#### Papers in proceedings of the world congress/conference published in prestigious foreign publisher such as Springer, Kluwer, Elsevier, John Wiley etc., or published by world-wide reputable scientific institutions such as IFAC, IFIP, IEEE, ACM, IET, SPIE, or listed in Web of Science

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## 8 Contact Address

Department of Mechatronics and Electronics  
Faculty of Electrical Engineering  
University of Žilina  
Univerzitná 1, 010 26 Žilina  
Slovak Republic  
Phone: ++421-41-513 1600  
Fax: ++421-41-513 1515  
E-mail: [kme@fel.uniza.sk](mailto:kme@fel.uniza.sk)  
www: <http://fel.uniza.sk/kme>

Katedra mechatroniky a elektroniky  
Elektrotechnická fakulta  
Žilinská univerzita  
Univerzitná 1, 010 26 Žilina  
Slovenská republika



## DEPARTMENT OF POWER ELECTRICAL SYSTEMS

### 1 General Information

Department of Power Electrical Systems was founded in the academic year 1955/56 as the Department of Electric Traction and Energetics at the Railway University in Prague. Since 1992 the department has been a part of the Faculty of Electrical Engineering.

The department had originally an accreditation in a field of "Electric Traction and Energetics". The department graduates were formerly trained mainly for 24 and 12 FMD, for industrial plants producing electric traction equipment (Skoda Plzen, CKD Trakce Praha, ZOS Nymburk, ZOS Vrutky), for both urban and industrial transport and for the scientific and research laboratories in the electro-technical industry.

The highly important period for the department was during years 1991 – 1994. In those years, a TEMPUS project JEP-1939/91-94 was accepted and realized. The project titled "*Improvement of Educational Activities in Power Electronics and its Applications*" considerably affected the next heading of the department. The aims of the project were: a creation of a new curriculum for Power Electronics, Electric Drives and Electrical Machines, setting up new laboratories, purchase of computing and measuring hardware, mobility of students and staff. The universities in Catania, Roma, London and Helsinki co-operated and guaranteed this project. The results of the project set the department forward in its effort to become a modern department with a high-level educational programme. In 1996 the department finished a TEMPUS project JEN-01939SQ-94 representing a continuity of the project mentioned above.

In 2005, the Faculty of Electrical Engineering underwent a vast reconstruction. A section of Power Electronics was secluded from the Department of Power Electrical Systems together with a part of Department of Electronics and Electrotechnology and formed a new Department of Mechatronics and Electronics.

Change of the labour market enforced the department, besides its own traditional educational and research activities, to look for other possibilities of employability of its graduates. Nowadays the department is divided into the section of Electroenergetics and section of Electric Drives and Electric Traction. Educational and research activities of these sections guarantee a wide professional orientation which covers almost whole power electrical engineering branch.

In the academic year 2005/2006, a three-degree study has been put to an effect at all universities in Slovakia. Department of Power Electrical Systems has been granted an accreditation for a bachelor degree in a programme of studies of Electrical Engineering; for master degree in programme of Electroenergetics, Electric Drives and Electric Traction. For PhD degree, third study degree, the department was accredited in a study programme of Power Electrotechnics.

Within the complex accreditation in 2009, University of Zilina confirmed its position as university. Department of Power Electrical Systems gained right to bestow the Bachelor degree in study program of Electrical Engineering, academic degree Ing. in study programs of Electroenergetics, Electric Drives and Electric Traction.

Since 1997 the department has had an accreditation for PhD degree study in a field of "Power Electrotechnics" with the following branches: Electric Drives, Electric Machines and Apparatus, Power Electronics and Electric Traction. Another field of PhD studies, "Electroenergetics," was added after complex accreditation in 2009.

Department is equipped with high quality computer and measuring technology in the area of technical infrastructure. The substantial improvement of department was achieved mainly

by help of European structural funds, which enabled reconstruction of rooms of department as well as the departments' instrumentation. This was possible mainly by the project: Centre of excellence of power electronics systems and materials for their components I,II.

Freescale Semiconductor from Czech Republic provided a big support for the department by generalizing latest technologies in the area of digital signal processors. Department was able to apply for grant research projects on this basis. Department solved several VEGA, KEGA and APVV projects recently, which have identified students, graduates and staff of the department.

Department intensively cooperate with significant companies from Slovakia. These are mainly Slovenske elektrarne, Slovenska elektrizacna prenosova sustava (SEPS), Stredoslovenska energetika, EVPU Nova Dubnica, Freescale Semiconductor, SIEMENS, ZSR, SEZ Krompachy and others.

## 2 Staff of the Department

Head of the Department:	Juraj Altus
Vice-head of the Department:	Alena Otcenasova
Secretary for Research:	Peter Bracinik
Administrative Support:	Darina Rufusova
Technical Support:	Anna Zuffova

### 2.1 Sections of the Department

#### 2.1.1 Section of Electric Drives and Electric Traction

Head of the Section:	Jan Vittek
Professors:	Valeria Hrabovcova, Jan Vittek
Associate Professors:	Milan Pospisil, Pavol Rafajdus
Research Fellows:	Jiri Drabek (½), Pavel Lehocky, Vladimir Vavrus
Senior Lecturers (with PhD):	Pavol Makys, Matej Pacha, Marek Stulrajter (¼)

#### 2.1.2 Section of Electroenergetics

Head of the Section:	Alena Otcenasova
Professors:	Juraj Altus, Michal Pokorny
Associate Professors:	Alena Otcenasova
Senior Lecturers (with PhD):	Josef Beran, Peter Bracinik, Miloslav Buzek, Marek Hoger, Marek Roch
Senior Lecturers (without PhD):	Ivan Litvaj

#### 2.1.3 Postgraduate Students

Internal (full-time) : Zdeno Biel, Jan Faber, Michal Hrkel, Jan Ivanecky, Lukas Kalamen, Miroslav Kovac, Peter Minarech, Peter Sekerak, Jan Turcek, until 31. 8. 2011: Matej Hrasko, Karel Kubatka, since 1. 9. 2011: Daniel Hropko, Matus Onufer

External (part-time) : since 1. 9. 2011: Miroslav Dubovsky, Jan Sitar

### 3 Teaching

#### 3.1 Courses in Bachelor and Master Degree Programmes

##### 3.1.1 Bachelor Degree Programmes

Code	Title	Lessons-Seminars-Exercises		
		Semester	Hours/week	Teachers
<i>Courses at the Faculty of Electrical Engineering</i>				
31103	Business Management and Economy	1	2 – 1 – 0	Litvaj
31105	Materials and Technologies in Electric. Engineer.	1	2 – 1 – 1	Beran
31107	Basics of Electrical Engineering	1	3 – 0 – 0	Buzek
31311	Informatics 2	3	2 – 0 – 2	Otcenasova
31404	Work safety in Electrical Engineering	4	2 – 0 – 1	Buzek
31411	Electric Machines in English 1	4	1 – 1 – 0	Hrabovcova
31447	Production and Maintenance of Elect. Devices	4	2 – 1 – 1	Pokorny
31454	Electric Machines	4	4 – 1 – 2	Hrabovcova
31500	Electrical Power Apparatus	5	2 – 0 – 2	Rafajdus
31501	Electric Traction 1	5	3 – 2 – 0	Pospisil
31507	Electroenergetics 1	5	3 – 0 – 2	Roch
31509	Selected sections of Electric Machines	5	2 – 0 – 2	Hrabovcova
31512	Electric Drives 1	5	3 – 1 – 1	Makys
31514	Electric Machines in English 2	5	1 – 1 – 0	Hrabovcova
31517	Electrical Standards and Metrology	5	2 – 0 – 1	Buzek
31525	Mechanics of Power Lines	5	2 – 2 – 0	Otcenasova
31559	Application of digital signal processors 1	5	0 – 0 – 2	Pacha
31600	Bachelor Thesis	6	0 – 2 – 0	Altus
31602	Bachelor Project	6	0 – 0 – 6	Altus
31607	Electric Traction	6	3 – 0 – 2	Pospisil
31608	Electric Drives 2	6	3 – 1 – 1	Vittek
31610	Electroenergetics 2	6	3 – 1 – 1	Altus
31615	Quality Management	6	2 – 1 – 0	Litvaj
31632	Application of digital signal processors 2	6	0 – 0 – 2	Pacha

##### *Courses at the Faculty of Mechanical Engineering*

2N111	Electrical Traction Equipment	2	3 – 2 – 0	Pospisil
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##### 3.1.2 Master Degree Programmes

Code	Title	Lessons-Seminars-Exercises		
		Semester	hours/week	Teachers
<i>Courses at the Faculty of Electrical Engineering</i>				
32106	Electroenergetics in English	1	0 – 2 – 0	Bracinik
32121	Transmission of Electric Energy	1	3 – 1 – 1	Altus
32122	Programmable logic controllers	1	2 – 0 – 2	Lehocky
32125	Control of Electric Drives 1	1	3 – 2 – 0	Vittek
32137	Electric Energy Generation	1	3 – 1 – 1	Roch
32201	Analysis of Electric Machines	2	2 – 0 – 2	Hrabovcova
32207	Electric Traction	2	2 – 1 – 1	Pospisil
32208	Electric Drives in Electroenergetics	2	2 – 1 – 1	Makys
32209	Electric Substations	2	2 – 0 – 1	Pokorny
32210	Electroheat and light	2	2 – 2 – 0	Pokorny
32213	Information systems in electroenergetics	2	2 – 0 – 2	Bracinik

32218	Power Supply of Electric Railways	2	2 – 2 – 0	Pospisil
32224	Microcomputer Systems Programming	2	2 – 0 – 2	Roch
32228	Control of Electric Drives 2	2	3 – 2 – 0	Vittek
32229	Control of Electric Power Systems	2	2 – 1 – 1	Bracinik
32230	Electricity distribution	2	2 – 1 – 1	Roch
32231	Sensors, actuators and interfaces	2	2 – 0 – 2	Lehocky
32241	Calculations of electrical networks	2	2 – 2 – 0	Altus
32303	Sensorless Control of Electric Drives	3	3 – 1 – 1	Vittek
32308	Discreet Control of Electric Drives	3	3 – 0 – 3	Makys
32309	Electroheat	3	2 – 2 – 0	Pokorny
32327	Negative Influences on Power System	3	2 – 2 – 1	Otcenasova
32333	Control of Electric Drives 1	3	3 – 1 – 1	Vittek
32334	Annual project	3	0 – 0 – 4	Altus, Vittek
32335	Simulation languages in Electroenergetics	3	2 – 0 – 2	Roch
32336	Lighting technique	3	2 – 1 – 0	Altus
32337	Special Electric Machines	3	2 – 0 – 2	Hrabovcova
32402	Diploma Thesis	4	0 – 2 – 0	Altus
32404	Diploma Seminar	4	0 – 0 – 4	Altus
32412	Materials in High Voltage technology	4	4 – 0 – 4	Beran
32414	Total Quality Management	4	2 – 4 – 0	Litvaj

## 4 Educational, Research and Scientific Projects

### 4.1 National projects

#### 4.1.1 Research Projects Funded by the Scientific Grant Agency of the Slovak Republic (VEGA)

*Title: Research of power electronic drive system control with single phase high frequency input and two phase orthogonal output for two phase SM/AM electrical machines (VEGA 1/0474/09)(2009 - 2011)*

Coordinator: Branislav Dobrucky

Co-operators: Valeria Hrabovcova, Pavol Rafajdus

*Title: Scientific research, modeling and simulation of transient events with the electrical systems of wind turbines (VEGA 1/0809/10) (2010 - 2011)*

Coordinator: Pavol Rafajdus

Co-operators: Valeria Hrabovcova, Peter Sekerak, Lukas Kalamen, Pavel Lehocky, Pavol Makys, Branislav Dobrucky

*Title: Optimal control techniques for lowering of alternating electric drives losses (VEGA 1/0355/11) (2011 - 2013)*

Coordinator: Jan Vittek

Co-operators: Pavel Lehocky, Pavol Makys, Milan Pospisil, Jan Faber, Peter Minarech, Matej Pacha, Marek Stulrajter, Vladimir Vavrus, Zdeno Biel, Michal Hrkel

#### 4.1.2 Projects Funded by the Cultural & Education Grant Agency (KEGA)

*Title: Integration of renewable energy laboratory in the educational process through an interactive multimedia Web interface (KEGA-K-09-003-00)*

Coordinator: Juraj Altus

Co-operators: Peter Bracinik, Marek Roch

#### 4.1.3 Research Projects Funded by the Slovak Research and Development Agency (APVV)

*Title: Fault Localization in 22 kV Power Network by Using the Elements of Artificial Intelligence (APVV-0560-07) (2008 - 2011)*

Coordinator: Juraj Altus

Co-operators: Alena Otcenasova, Pavol Rafajdus, Peter Bracinik, Marek Roch, Marek Hoger, Matej Hraske

*Title: Investigation of electromagnetic design of switching linear reluctance motor (2010 – 2011) (APVV-SK-CN-0020-09), Slovakia – Chinese intergovernmental technical cooperation*

Coordinator: Pavol Rafajdus

Co-operators: Valeria Hrabovcova, Peter Sekerak, Lukas Kalamen

*Title: Improvement of switching reluctance motor properties for enhancement of industrial processes safety (2010 – 2011) (APVV-SK-RO-0016-10), Slovakia – Romanian intergovernmental technical cooperation*

Coordinator: Pavol Rafajdus

Co-operators: Valeria Hrabovcova, Peter Sekerak, Lukas Kalamen, Vladimir Vavrus

#### 4.1.4 Governmental program of research and development

*Title: Brokerage aviation center for technology and expertise transfer into transport and transport infrastructure. Activity 2.2 (OP VaV 152/2011/2.2), (2011 – 2013)*

Coordinator: Alena Otcenasova

Co-operators: Juraj Altus, Michal Pokorny, Marek Hoger

#### 4.1.6 Projects of European Structural Funds

*Title: ITMS 26220120003 Centre of excellence of power electronics systems and materials for their components (2009 – 2011)*

Coordinator: Pavol Spanik

Co-operators: Jan Vittek, Marek Stulrajter, Pavol Makys, Pavol Rafajdus, Valeria Hrabovcova, Pavel Lehocky, Juraj Altus, Peter Bracinik, Marek Roch

*Title: ITMS 26220120046 Centre of excellence of power electronics systems and materials for their components II (2009 – 2011)*

Coordinator: Pavol Spanik

Co-operators: Jan Vittek, Marek Stulrajter, Pavol Makys, Pavol Rafajdus, Valeria Hrabovcova, Pavel Lehocky, Juraj Altus, Peter Bracinik, Marek Roch

*Title: ITMS 26110230005 Flexible and attractive study at the Univerzity of Zilina for the needs of labour market and knowledge society (2010 – 2012)*

Coordinator of professional activities: Michal Pokorny

*Title: ITMS 26220220088 Applied research and development of innovative sources of energy for ultra-high pressure impulses (2010 – 2013)*

Coordinator: Ecoland s.r.o.

Co-operators: Pavol Rafajdus, Vladimir Vavrus

*Title: ITMS 26110230004 Systematization of advanced technologies and knowledge transfer between industrial sector and universities (2010 – 2013)*

Coordinator: Pavol Rafajdus

#### 4.1.7 Other domestic projects

Operational Programme – Education

*Title: The Creation of new educational programs in training for the automotive industry II.*

Coordinator: Lubomir Galbavy (National Institute for Vocational Training)

Co-operators: Ivan Litvaj, Viliam Kopecky

## 4.2 International Projects

#### 4.2.5 Socrates/Erasmus Projects

*Title: 502784-LLP-1-2009-1-BE-ERASMUS-EMHE Shaping Inclusive and responsive University Strategies – Project SIRUS. EUA Project implemented under Lifelong Learning Programme of the European Union (2009 - 2011).*

Coordinator: Michael Horig (EUA)

Co-operators: University of Zilina - Michal Pokorny

*Title: 155980-LLP-1-2009-1-IT-ERASMUS-ENWA Academic Network EUGEN – European and Global Engineering Education (2009 - 2011)*

Coordinator: Claudio Borri (Università degli Studi di Firenze, Italy)

Co-operators: Michal Pokorny

#### 4.2.10 Other international projects

*Title: HECTOR – HELicopter fuselage Crack monIToring and prognosis through on-board sensOR (2009 – 2012)*

Coordinator: Robert Hudec

Co-operators: Pavol Rafajdus, Pavol Makys, Vladimir Vavrus, Matej Pacha

## 5 Co-operation

### 5.1 Co-operation partners in Slovakia

- STU Bratislava: Department of Electrical Machines and Devices
- STU Bratislava: Department of Electrical Power Engineering
- TU Kosice: Department of Electric Power Engineering
- TU Kosice: Department of Electrical Drives and Mechatronics
- ABB Elektro s.r.o. Zilina
- CE Qualite Slovakia Nova Dubnica
- ELTECO Zilina, Slovakia
- ELZA Zilina, Slovakia
- EVPU Nova Dubnica, Slovakia
- GI-BON Quality systems Zilina
- IBG Slovakia s.r.o.
- MARKAB spol. s r.o. Zilina
- NES Nova Dubnica
- SUTN Bratislava
- PPA Controls
- PV SZKV Zvolen
- Regional Advisory and Information Centre Povazska Bystrica
- SIEMENS
- Slovak centre of productivity Zilina, University of Zilina
- Stredoslovenska energetika, a.s. Zilina
- SEPS, a.s. Bratislava
- Schneider Electric Slovakia s.r.o.

- Sungwoo hitech, s.r.o. Zilina
- Technical Testing Institute in Piest'any
- Vinuta Rajec, s.r.o.
- VUKI, a.s. Bratislava
- VUVT Engineering, a.s. Zilina
- VVUZ Vrutky
- ZSSK Division ZKV Bratislava
- ZOS Vrutky
- ZOS Zvolen
- ZSR Bratislava
- CARGO Slovakia Bratislava

## 5.2 International Co-operation Partners

- Aalto University Helsinki, School of Science and Technology, Department of Electrical Engineering, Prof. Tapani Jokinen, FIN
- ABB Brno, s.r.o. PTPM Brno, CZ
- ABD Praha, s.r.o. zavod Technika – prof. Kejzlar, Ing. Nemecek, CZ
- AD Decelopments Milton Keynes, p. Frank Shepard, UK
- Appraisals Services – Forensic Institute Praha, Ing. Karel Simek, CZ
- AZD Praha, dr. Ing. Ales Lieskovsky, dr. Ing Ivo Myslivec, CZ
- Berner Fachhochschule, Hochschule für Technik und Architektur Burgdorf, prof. Jean-Pierre Steger – vizedirektor, CH
- Cinvestav Guadalajara, Dr. A. G. Loukjanov, Prof. Bernardino Castillo-Toledo, MEX
- Control Technique Dynamics, Andover, p. Suji Jayasoma, UK
- CZ Loko, a.s., Ceska Trebova, Ing. Bohumil Skala, CZ
- Ceske drahy O12 Praha, Ing. Jan Plomer, CZ
- ELCOM Praha, Ing. Jiri Korenc, Ing. Jiri Holoubek, CZ
- Freescale semiconductor, Czech Systems Laboratory, Ivan Skalka, Martin Mienkina, Peter Balazovic, Roman Filka, Ladislav Makovic, CZ
- Hochschulle für Technik und Wirtschaft, Dresden, Fachbereiches Elektrotechnik, Prof. Dr. Ing. habil. Gerhard Hofmann, D
- Institut National des Telecommunications Paris/Evry, Dr. Jean-Pierre Vidal, Dr. J. C. Chimenez, Dr. Michele Merlier, F
- Lappeenranta University of Technology Finland, Faculty of Electric Engineering – prof. Juha Pyrhönen, FIN
- Politechnika Gdańska, Prof. Krzysztof Karwowski, PL
- Politechnika Warszawa, Instytut Maszyn Elektrycznych, Prof. Ing. Jan Kacprzak, DrSc., Prof. Ing. Adam Szelag, PhD., PL
- SKODA Transportation Plzen, Ing. Milan Sramek, CZ
- SKODA Electric Plzen, dr. Ing. Ladislav Sobotka, CZ
- Technical University of Bochum, prof. Andreas Steimel, D
- Technische Universität Darmstadt, Institut für Elektrische Energiewandlung – Prof. Dr. Ing. Andreas Binder, D
- Technische Universität Dresden, Lehrstuhl Elektrische Antriebe und Grundlagen der Elektroenergietechnik – Prof. Dr. Ing. habil. P. Büchner, D
- Technische Universität Dresden, Institut für Energieversorgung und Hochspannungstechnik – Prof. Dr. Ing. habil. Peter Schegner, D
- Technische Universität Graz, Fakultät für Elektrotechnik – Prof. Dr. Ing. Manfred Rentmeister, Institut für Elektrische Machines und Antriebe – Prof. Dr. Ing. Hansjörg Köfler, Institut der El. Leistungssysteme – Prof. Dr. Ing. Manfred Sakulin, A
- University of Brandford, Leeds, Dr. Li Zhang, UK
- Universita degli Studi di Catania, Dipartimento Elettrico Elettronico e Sistemistico, Prof. Alfio Consoli, ITA

- University of East London, Department of Electrical and Electronic Engineering, Dr. Roy Perryman, Prof. Stephen Dodds, UK
- University of Nottingham, Dr. Pat Wheeler, Dr. G. M. Asher, UK
- Universidade do Porto, prof. F. Maciel Barbosa, PT
- University of Picardie – Jules Verne, Amien, Prof. Gerard-Andre Capolino, F
- VSB – Univerzita Ostrava, prof. Ing. Josef Palecek, doc. Ing. J. Kijonka, CZ
- VSB – Univerzita Ostrava, doc. Ing. Robert Cep, PhD., Ing. Lenka Cepova, PhD. CZ
- Zapadoceska univerzita Plzen, doc. Ing. Jiri Danzer, CSc., prof. Ing. Vaclav Kus, CSc., CZ
- Zeleznicni zkusebni okruh VUZ Cerhenice, Ing. Eduard Novak, CSc. CZ

### 5.3 Visitors to the Department

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Andreu Urzaiz Abello	Escola Universitaria Salesians de Saria, Spain, Erasmus	300 days
Pedro Marques	Universidade do Porto, Erasmus	180 days
Miguel Lage	Universidade do Porto, Erasmus	300 days
Luis F. P. Alfonso	Universidade do Porto, Erasmus	180 days
Claudia Martis	TU Cluj – Romania, APVV project	6 days
Karoly Biro	TU Cluj – Romania, APVV project	6 days
Ioan-Adrian Viorel	TU Cluj – Romania, APVV project	6 days
Chen HAO	TU Suzhou – China, bilateral project SK-CN	7 days
Yang ZHAO	TU Suzhou – China, bilateral project SK-CN	7 days
Xiaohui QIU	TU Suzhou – China, bilateral project SK-CN	7 days
Ladislav Sliva	VSB-TU Ostrava, CZ, NSP SR, scholarship	60 days

### 5.4 Visits to Foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Juraj Altus	Wisla – PL, Conference PE 2011	3 days
Juraj Altus	Manchester – UK, Conference IEEE	5 days
Juraj Altus	Dlouhe Strane, CZ, Conference EPE 2011	3 days
Michal Pokorny	University of Nis – Serbia, TEMPUS program	4 days
Jan Vittek	Beijing – China, Conference ICIEA 2011	12 days
Alena Otcenasova	Rome – Italy, Conference IEEEIC 2011	4 days
Alena Otcenasova	Wisla – PL, Conference PE 2011	3 days
Alena Otcenasova	Dlouhe Strane, CZ, Conference EPE 2011	3 days
Pavol Rafajdus	Technical University of Cluj-Napoca, Romania	5 days
Peter Bracinik	Silesian University of Technology, PL	14 days
Peter Bracinik	Manchester – UK, Conference IEEE	5 days
Marek Hoger	Dukovany – CZ, Nuclear power plant, CEZ	10 days
Pavol Makys	Politecnico di Milano – Italy, Project HECTOR	2x5 days
Matej Pacha	Politecnico di Milano – Italy, Project HECTOR	10 days
Matej Pacha	Niagara Falls, IEEE Conference IEMDC 2011	9 days
Marek Roch	Rome – Italy, Conference IEEEIC 2011	4 days
Vladimir Vavrus	Technical University of Cluj-Napoca, Romania	5 days
Vladimir Vavrus	Politecnico di Milano – Italy, Projekt HECTOR	5 days
Jan Faber	ABB – Sweden	4 months
Lukas Kalamen	Kos, Greece, IEEE Conference SMM20	5 days
Lukas Kalamen	Technical University of Cluj-Napoca, Romania	5 days
Karel Kubatka	Dlouhe Strane, CZ, Conference EPE 2011	3 days
Peter Minarech	Zakopane – PL, XV. International Conference Transcomp	3 days
Peter Sekerak	Kos, Greece, IEEE Conference SMM20	5 days
Peter Sekerak	Technical University of Cluj-Napoca, Romania	5 days
Jan Turcek	Silesian University of Technology, PL	14 days



## 5.5 Contracts (Business Activities)

*1/2011 Design and execution of electric drive for internal high voltage disconnectors*

Customer: SEZ Krompachy a.s.  
 Coordinator: Pavol Rafajdus  
 Co-operators: Pavel Lehocky, Pavol Makys

*Support of software development*

Customer: Telmining s.r.o  
 Coordinator: Pavol Makys  
 Co-operators: Marek Stulrajter, Matej Pacha

*Analysis of voltage and simultaneously current conditions at the given node Tr 110/22 kV Bytca*

Customer: SSE-D, a.s., Zilina  
 Coordinator: Juraj Altus  
 Co-operators: Alena Otcenasova, Peter Bracinik, Marek Hoger

*Analysis of voltage and simultaneously current conditions at the given node Tr 110/22 kV Rajec*

Customer: SSE-D, a.s., Zilina  
 Coordinator: Juraj Altus  
 Co-operators: Alena Otcenasova, Peter Bracinik, Marek Hoger

## 6 Other activities

### 6.4 Membership in International Institutions/Committees

- Juraj Altus – Representative of University of Zilina, CIRED, CZ,  
 – Representative of SK in International Energetic Agency IEA, Paris, F  
 – Member of IEEE,  
 – Member of international scientific committee of EPE 2011, Brno, CZ
- Valeria Hrabovcova – IEEE senior member,  
 – Head of professional group of IEEE IAS/IES CS
- Jan Vittek – Member of program committee of conferences IASTED,
- Jiri Drabek – Representative of Slovakia in committees: IEC/TC9 Electric Railways Equipment, CENELEC/TC9X Electrical and Electronic Applications for Railways,
- Alena Otcenasova – Member of international scientific committee of conference EPE 2011, Brno, CZ  
 – Member of IEEE
- Milan Pospisil – Vice-Chairman of committee for PHD thesis defense in the scientific field of Energetics, FEI VSB TU Ostrava, CZ
- Pavol Rafajdus – Member of IEEE,  
 – Member of international committee of conference Low Voltage Electrical Machines,
- Peter Bracinik – Member of IEEE,
- Matej Pacha – Member of IEEE, IAS/IES Joint Chapter Treasurer  
 – Member of expert group Research and development CZ LOKO, Ceska Trebova, CZ

## 6.5 Membership in National Institutions/Committees

- Juraj Altus – Departmental Committee for PhD thesis defense in a field of Electroenergetics in Bratislava,  
– Member of the commission of „Aurel Stodola Award in Power Engineering”, SE Bratislava,
- Valeria Hrabovcova – Member of Slovak Electro-technical Committee at SUTN,  
– Member of the APVV Board for the programme “Human Potential in a Field of Research and Development and Popularisation of Science (LPP)”  
– Departmental Committee for PhD thesis defence in a field of Power Electrotechnics at FEI STU Bratislava  
– Faculty Committee of PhD study in Mechanical Faculty TU Kosice in the field of Mechatronics
- Jan Vittek – Committee of VEGA N. 5 for Electrical Engineering and Informatics,  
– Magazine Editorial Board Acta Electrotechnica et Informatica, FEI TU Kosice,  
– Faculty committee for PhD thesis defence in the field of Mechatronics, SjF TU Kosice,
- Jiri Drabek – Member of committee SUTN TNK 83 “Electric and Electronic Devices for Railways”,  
– Member of expert group reviewing projects APVV at APVV Bratislava,
- Josef Beran – Executive board of Association of Electrical Specialist active in SVK with a nationwide competence (chairman),  
– Periodical „ELEKTROREVUE“, ISSN 1336-8559, with a nationwide operation for the members of Association of Electrical Specialist (managing editor), registered at the Ministry of Culture under licence number EV 927/08,  
– Organisation committee for XIII. Slovak Seminar for Electrical Specialists Trencin, 2011, October 11. – 13.
- Peter Bracinik – Contact Person at University of Zilina for International PhD Workshop – OWD, which is annually organized by Department of Mechatronics at Silesian University of Technology, Gliwice, Poland
- Milos Bůzek – Executive board of Association of Electrical Specialist active in SR (vice-chairman)  
– Periodical „ELEKTROREVUE“, ISSN 1336-8559, with a nationwide operation for the members of Association of Electrical Specialist (executive editor), registered at the Ministry of Culture under licence number EV 927/08  
– Organisation committee for XIII. Slovak Seminar for Electrical Specialists Trencin, 2011, October 11. – 13.
- Matej Pacha – Contact Person at University of Zilina for cooperation with Freescale Semiconductor Inc., the organizer of student competitions.  
– Organisation committee for 9-th European conference of young research and science workers Transcom 2011 Zilina, Slovakia, 2011, June 27. – 29.

## 6.6 Membership in University Boards

- Juraj Altus – Departmental committee for PhD thesis defence in a field of Power Electrical Engineering at Faculty of Electrical Engineering  
– Departmental committee for PhD thesis defence in a field of Energetics at Faculty of Electrical Engineering  
– Scientific board of Faculty of Electrical Engineering  
– Scientific board of University of Zilina  
– Academic Senate of Faculty of Electrical Engineering (chairman)
- Valeria Hrabovcova – Departmental committee for PhD thesis defence in a field of Power Electrical Engineering at Faculty of Electrical Engineering  
– Scientific board of Faculty of Electrical Engineering

- Michal Pokorny – Departmental committee for PhD thesis defence in a field of Power Electrical Engineering at Faculty of Electrical Engineering
- Departmental committee for PhD thesis defence in a field of Energetics at Faculty of Electrical Engineering (chairman)
  - Scientific board of Faculty of Electrical Engineering
- Jan Vittek – Departmental committee for PhD thesis defence in a field of Power Electrical Engineering at Faculty of Electrical Engineering (chairman)
- Scientific board of Faculty of Electrical Engineering
- Alena Otcenasova – Departmental committee for PhD thesis defence in a field of Energetics at Faculty of Electrical
- Milan Pospisil – Departmental committee for PhD thesis defence in a field of Power Electrical Engineering at Faculty of Electrical Engineering, Zilina
- Departmental committee for PhD thesis defence in a field of Motor Vehicles, Rail Vehicles, Ships and Aeroplanes, Zilina
- Pavol Rafajdus – Scientific board of Faculty of Electrical Engineering, Zilina
- Departmental committee for PhD thesis defence in a field of Energetics at Faculty of Electrical
- Peter Bracnik – Alumni club of Faculty of Electrical Engineering (secretary)
- Marek Roch – board of Information and Communication Technology of the University (member)
- board of Information and Communication Technology at Faculty of Electrical Engineering (member)
- Ivan Litvaj – Quality Manager at Faculty of Electrical Engineering.

## 7 Publications

### Chapters in scientific monographs

- [1] ALTUS, J. POKORNY, M. BRACINIK, P.: *Renewable Energy Sources vs Control of Slovak Electric Power System*, Renewable Energy - Trends and Application, INTECH Open Access Publisher, Croatia, Rijeka, 2011, 10, ABC, pp. 101 - 122, ISBN 978-953-307-939-4,

### CC magazines – Current Content magazines

- [2] KAMIEN, K. NERG, J. PYRHONEN, J. ZABOIN, V. HRABOVCOVA, V. RAFAJDUS, P.: *Hybrid excitation synchronous generators for island operation*, Published in IET Electric Power Applications, ISSN 1751-8660, IET Electr. Power Appl., 2012, Vol. 6, Iss. 1, pp. 1–11

### Journals registered in one of the world databases (Thomson Scientific Master Journal List alebo SCOPUS)

- [3] HOGER, M., RAFAJDUS, P., BRACINIK, P., KANKULA, L.: *The specification of data needed for fault location in medium voltage distribution networks based on triangulation principle*, Przegląd elektrotechniczny (Electrical Review), R. 87 NR 2/2011, Poland, 2011, 02, ISSN 0033-2097, pp. 44 - 48, ADE
- [4] HRABOVCOVA, V., RAFAJDUS, P., LIPTAK, M.: *Output Power of Switching Reluctance Generator with regard to the Phase Number and Number of Stator and Rotor Poles*, Journal of Electronics and Electrical Engineering, No.3 (109), Lithuania, 2011, ISSN 1392-1215, pp. 25-30, ADE
- [5] RAFAJDUS, P. SEKERAK, P. KALAMEN, L. HRABOVCOVA, V. CHEN, H.: *Static and dynamic analysis of Linear Switching Reluctance Machine*, Communications, 4/2011, p.6-11, ISSN 1335-4205, SCOPUS, ADE
- [6] HOGER, M. BRACINIK, P. ROCH, M.: *Simulation of a power substation's control system operation*, Communications: Scientific Letters of the University of Zilina, Vol. 13, No. 2A, Zilina, 2011, ISSN 1335-4205, p. 44. - 48., ADF

- [7] RADVAN, R. DOBRUCKY, B. FRIVALDSKY, M. RAFAJDUS, P.: *Modelling and design of HF 200 kHz transformers for hard- and soft-switching application*, In: Elektronika ir elektrotechnika = Electronics and electrical engineering. ISSN 1392-1215. Nr. 4 (110) (2011), p. 7-12.
- [8] TURCEK, J. HRASKO, M. ALTUS, J.: *Photovoltaics in present days and their coexistence with power system*, Communications – Scientific letters of the University of Zilina, 2A/2011, Vol. 13., 2011, ISSN 1335-4205, p. 109. - 113., ADF

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- [10] PRAZENICA, M. DOBRUCKY, B. SEKERAK, P. KALAMEN, L.: *Design, Modeling and Simulation of Two-Phase Two-Stage Electronic System With Orthogonal Output for Supplying of Two-Phase ASM*, Advances in Electrical and Electronic Engineering, 2011, 03, 30, ISSN 1804-3119, p. 56 - 64, ADE
- [11] MALEK, M. MAKYS, P. STULRAJTER, M.: *Feedforward control of electrical drives - rules and limits*, AEEE, Power Engineering and Electrical Engineering, vol. 9, no. 1, 2011,03, ISSN 1804-3119, p. 35-42, ADE

#### Other Reviewed Slovak Journals

- [12] BRACINIK, P. ROCH, M. SMIDOVIC, R.: *Possibilities of Slovak Photovoltaic Power Plants Output Power Prediction*, Magazine for electrical engineering and energetics. vol. 17, no. 2 (2011), Bratislava, Slovakia, 2011, 04, ISSN 1335-2547, pp. 8-11, ADF
- [13] VITTEK, J. MAKYS, P.: *Controls with forced dynamics – advantages and disadvantages*, ATP Journal 2/2011, 2011, 02, ISSN 1336-233X, p.: 14, ADF

#### International reviewed foreign conferences

- [14] BRACINIK, P. HOGER, M. KOVAC, M.: *Fault location in medium voltage networks with tree structure*, XIII. International PhD Workshop OWD 2011, 2011, 10, 22.-25., ISBN 83-922242-8-0, p. 461. - 466., AEC
- [15] BRACINIK, P. HOGER, M. RAFAJDUS, P. KOVAC, M. OTCENASOVA, A. ROCH, M.: *The verification of data acquisition approach for new fault location method in medium voltage networks*, 10-th International Conference on Environment and Electrical Engineering – IEEEIC 2011, Rome, Italy, 2011, 05, 08.-11., ISBN 978-1-4244-8781-3, p. 1055-1058, AEC
- [16] MINARCIK, M. OTCENASOVA, A.: *Practical measurement of power quality and the possibility of its improvement*, 12<sup>th</sup> International Scientific Conference Electric Power Engineering 2011, Kouty nad Desnou, Czech Republic, 2011, 05, 17.-19., ISBN 978-80-248-2393-5, p. 478-481, AEC
- [17] BRACINIK, P. HOGER, M. KOVAC, M. ALTUS, J.: *Verification of new fault location method for medium voltage distribution networks on scale model of 22 kV power line*, 12<sup>th</sup> International Scientific Conference Electric Power Engineering 2011, Kouty nad Desnou, Czech Republic, 2011, 05, 17.-19., ISBN 978-80-248-2393-5, p. 33-36
- [18] KOVAC, M.: *Multi-agent systems in electroenergetics*, XLIV. Sesit katedry elektrotechniky, VSB TU Ostrava, Czech Republic, 2011, 02, ISBN 978-80-248-2378-2, AEE
- [19] IVANECKY, J.: *Virtual power plant concept*, VSB TU Ostrava, Czech Republic, 2011, 02, ISBN 978-80-248-2378-2, AEE
- [20] SEKERAK, P. HRABOVCOVA, V. RAFAJDUS, P. KALAMEN, L. PYRHONEN, J.: *Effect of PM demagnetization on permanent magnet synchronous motor performance*, 20th International Conference on Soft Magnetic Materials, Kos, Greece, 2011, 09, 18.-22., ISBN 978-960-9534-14-7, p. 79, AFC

- [21] KASSA, J. SEKERAK, P. PRAZENICA, M.: *Design Analysis of Two-Stage Power Electronic Converter for Feeding of 2-Phase PMSM*, Transcom, Zilina, 2011, 06, 27-29, ISBN 978-80-554-0373-1, p. 65-72, AFC
- [22] VITTEK, J. BRIS, P. BIEL, Z. HRKEL, M.: *Forced Dynamics Position Control of the Drive with Flexible Coupling and Load Position Measurement*, Proceedings of the 2011 6th IEEE Conference on Industrial Electronics and Applications, Beijing, China, 2011, 06., 21.-23., ISBN: 978-1-4244-8755-4, p. 2073-2078, AFC
- [23] ALTUS, J. TURCEK, J.: *Possibilities of connectivity of photovoltaic power plants into Slovak power system*, 12th International Scientific Conference Electric Power Engineering 2011, Kouty nad Desnou, CZ, 2011, 05, 17. - 19., ISBN 978-80-248-2393-5, p. 57. - 60., AFC
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- [25] KALAMEN, L. RAFAJDUS, P. SEKERAK, P. HRABOVCOVA, V.: *A novel method of magnetizing inductance investigation of self-excited induction generators*, 20th International Conference on Soft Magnetic Materials, Kos, Greece, 2011, 09, 18.-22., ISBN 978-960-9534-14-7, p. 82, AFC
- [26] KALAMEN, L. RAFAJDUS, P. SEKERAK, P. HRABOVCOVA, V. ONUFER, M.: *Magnetizing Inductance as a Decisive Factor of Induction Generator Self-Excitation*, XI. International Conference on Low Voltage Electric Machines LVEM 2011, Slapanice, Czech Republic, 2011, 11, 7.-8., ISBN 978-80-2144362-4, AFC
- [27] SEKERAK, P. HRABOVCOVA, V. RAFAJDUS, P. KALAMEN, L. ONUFER, M.: *Operation Optimization of Permanent Magnet Synchronous Motor with Regard to Efficiency*, Low Voltage Electric Machines LVEM 2011, Slapanice, Czech Republic, 2011, 11, 7.-8., ISBN 978-80-2144362-4, AFC
- [28] RAFAJDUS, P. ONUFER, M. HRABOVCOVA, V. SEKERAK, P. KALAMEN, L. CHEN, H.: *Optimized Design of Linear Switching Reluctance Machine*, LVEM, Slapanice, CZ, 2011, 11, 7.-8., ISBN 978-80-2144362-4, AFC
- [29] TURCEK, J. SMIDOVIC, R.: *Operation of photovoltaic power plants and their influence on ancillary services*, XIII International PhD Workshop, OWD 2011, Wisla, PL, 2011, 10, 22. - 25., ISBN 83-922242-8-0, p. 139. - 142., AFC
- [30] BRACINIK, P. HOGER, M. ALTUS, J. KOVAC, M.: *Testing of New Fault Location Methods for Medium Voltage Networks*, IEEE PES Innovative Smart Grid Technologies Europe 2011, Manchester, UK, 2011, 12, 5.-7., p. 7, AFC
- [31] BENOVA, M. DOBRUCKY, B. POKORNY, M.: *Nonlinear modelling and simulation of system consisting of resonant filter – high-order inverter in transient and steady state*, In: Applied simulation and modelling (ASM 2011): proceedings of the nineteenth IASTED international conference, Crete, Greece, 2011, 06, 22-24., ISBN 978-0-88986-884-7, p. 131-136, AFC
- [32] SEKERAK, P. HRABOVCOVA, V. RAFAJDUS, P. KALAMEN, L. ONUFER, M.: *Effect of permanent magnet rotor design on PMSM properties*, ISEM 2011, Prague, 2011, 09, 7.-8., ISBN 978-80-01-04890-0, p. 97-104, AFC
- [33] V. CHINDRIȘ, TEREĆ, RAREȘ; RUBA, MIRCEA; SZABO, L. RAFAJDUS, P.: *Useful software tool for simulating switching reluctance motors*, In: ECMS 2011: proceedings 25th European conference on modelling and simulation: June 7th-10th, 2011, Krakow, Poland. 2011. ISBN 978-0-9564944-2-9. - p. 216-221.
- [34] RAREȘ TEREĆ, BENTIA, IOANA; RUBA, MIRCEA; SZABO, L. RAFAJDUS, P.: *On the usefulness of numeric field computations in the study of the switching reluctance motor's winding faults* In: ISCIII 2011: 5th international symposium on computational intelligence and intelligent informatics: Sept. 15-17, 2011, Floriana, Malta: proceedings. - [S.l.: IEEE], 2011. - ISBN 978-1-4577-1859-5. - p. 117-120.
- [35] RAREȘ TEREĆ, BENTIA, IOANA ; RUBA, MIRCEA ; SZABO, L. RAFAJDUS, P.: *Effect of winding faults on the switching reluctance machine's working performances*, In: LINDI 2011: 3rd IEEE international symposium on logistics and industrial informatics: August

25-27, 2011, Budapest, Hungary. Budapest: Obuda university, 2011. - ISBN 978-1-4577-1840-3. - p. 143-148.

- [36]OTCENASOVA, A. ALTUS, J. HECKO, P. ROCH, M.: *Measurement characteristics of voltage in practice and possibilities for improvement of voltage*, Prognozowanie w elektroenergetyce PE 2011, XI międzynarod. konferencja naukowa, Wisła, Częstochowa, Poland, 2011, 09, 14-16., ISBN 978-83-7193-504-6/1234-9895, p. 13-15, AFG
- [37]ROCH, M. BRACINIK, P. ALTUS, J. OTCENASOVA, A.: *Control of single-phase power active filter*, Prognozowanie w elektroenergetyce, PE 2011, XI międzynarodowa konferencja naukowa, Wisła, Częstochowa, Polsko, 2011, 09, 14-16., ISBN 978-83-7193-504-6/1234-9895, p. 478-481, AFG

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- [39]BRACINIK, P. HOGER, M. ALTUS, J. OTCENASOVA, A. ROCH, M.: *Using the principles of triangulation for fault localization in 22 kV distribution networks*, 10th International Scientific Conference Energy-Ecology-Economy 2011 Power Engineering 2011, Tatranske Matliare, Slovakia, 2011, 06, 7. - 9., ISBN 978-80-89402-41-0, p. 5, AED
- [40]KOVAC, M.: *Electrical power system restoration using multi-agent system*, Conference ELITECH 2011, Bratislava, Slovakia, 2011, ISBN 978-80-227-3500-1, AFD
- [41]ORAVEC, J. SMIDOVIC, R. TURCEK, J.: *Operation of power system with photovoltaic power plants*, 10th International Scientific Conference Energy-Ecology-Economy 2011 Power Engineering 2011, Tatranske Matliare, Slovakia, 2011, 06, 07. - 09., ISBN 978-80-89402-41-0, p. 39. - 40., AFD
- [42]MINARECH, P. VITTEK, J. FABER, J.: *Friction Respecting Energy Saving PMSM Position Control*, Transcom 2011, 9-th EUROPEAN CONFERENCE OF YOUNG RESEARCH AND SCIENCE WORKERS, Proceedings, Section 4, Published by University of Zilina, First Editions, Printed by EDIS - Zilina University publisher, Zilina, Slovakia, 2011, 06, 27.-29., ISBN 978-80-554-0373-1, p. 95-98, AFD
- [43]FABER, J. VITTEK, J. MINARECH, P.: *Calibration of resolver sensor using ellipse fitting technique*, Transcom 2011, Zilina, 2011, 06, 27.-29., ISBN 978-80-554-0373-1, p. 29-33, AFD
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- [46]LITVAJ, I. SLAMKOVA, E. KOVACIKOVA, A.: *Quality system management in small and medium enterprises*, In: Industrial engineering of the future - InvEnt 2011 : proceedings of the international conference, Zilina: University of Zilina, 2011, ISBN 978-80-554-0409-7, p. 60-63, AFD
- [47]DRABEK, J.: *Production of modern electric vehicles for public transportation in Czech Republic*, In: PRORAIL 2011: XX. International conference Current Issues in Rail Vehicles, Zilina: Science and Technology Society at the University of Zilina, 2011, ISBN 978-80-89276-30-1, p. 41-44, AFD
- [48]VITTEK, J. POSPISIL, M. LEHOCKY, P.: *Speed and position forced dynamics control of servodrives*, In: Central European school of doctoral study : in the field of power electrical engineering and automation, Trencianske Teplice, Slovakia, 2011, 9, 20-22., ISBN 978-80-554-0421-9, p. 120-127, AFD

- [49]PACHA, M. STEPANEK, J.: *Operation of diesel-electric vehicles SM42 with two combustion engines*, In: PRORAIL 2011: XX. International conference Current Issues in Rail Vehicles, Zilina: Science and Technology Society at the University of Zilina, 2011, 9, 21-23., ISBN 978-80-89276-32-5, p. 13-20, AFD
- [50]TURCEK, J. HRASKO, M.: *Measurement of photovoltaic modules and solar radiation*, TRANSCOM 2011, Zilina, Slovakia, 2011, 06, 27. - 29., ISBN 978-80-554-0373-1, p. S4: 141 - 144, AFD

#### Professional work in non-CC domestic and foreign journals

- [51]BERAN, J. BUZEK, M.: *Issue of the electromechanical elements lifetime determination*, In: Elektrov revue: Newsletter, April - June 2011, BDF, p. 5, ISSN 1336-8559
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- [53]BUZEK, M.: *News in the area of low voltage electrical installations – requirements for special installations and areas*, Elektrov revue No. 3, 2011, p. 3-6, ISSN 1336-8559
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#### Other publications

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- [57]HOGER, M.: *Model of operation and control of electric substation for supply of single-phase traction 25 kV, 50 Hz (Model prevadzky a riadenia elektrickej stanice pre napajanie jednofazovej trakcie 25 kV, 50 Hz)*, PhD thesis, University of Zilina, 31.05.2011, DAI, p. 100
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- [60]URBANSKI, K.: *Sensorless control of PMSM high dynamic drive at low speed range*. In IEEE International Symposium on Industrial Electronics: proceedings. 2011. ISBN 978-142449312-8, s. 728-732. SCOPUS/ Vittek, J. Dodds, S. Altus, J. Perryman, R.: *Sliding mode based outer control loop for sensorless speed control of permanent magnet synchronous motor*. In: 8th IEEE mediterranean conference on control & automation: July 17th - 19th, 2000 University of Patras, Rio, Greece: proceedings. - Patras: University of Patras, 2000. - [6 p.].
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## 8 Contact Address

Department of Power Electrical Systems  
Faculty of Electrical Engineering  
University of Zilina  
Univerzitna 1, 010 26 Zilina  
Slovak Republic  
Phone:++421-41-513 2151  
Fax:++421-41-513 1515  
E-mail:[kves@fel.uniza.sk](mailto:kves@fel.uniza.sk)  
www: <http://www.kves.uniza.sk>

Katedra vykonovych elektrotechnickych systemov  
Elektrotechnicka fakulta  
Zilinska univerzita  
Univerzitna 1, 010 26 Zilina  
Slovenska republika

## DEPARTMENT OF CONTROL AND INFORMATION SYSTEMS

### 1 General Information

The Department of Control and Information Systems (further referred to as the DCIS) guarantees the study branch Automation – study programme Automation in bachelor degree, study branch Automation – study programme Process Control Engineering in MSc. degree and study branch Automation – study program Process Control Engineering in PhD. degree at the Faculty of Electrical Engineering of the University of Žilina.

Research activities of the DCIS are directed at the sphere of information and safety-related system analysis and synthesis ranging from solution of theoretical models to practical projects of operation including implementation. There are many sectors of activities in which the DCIS has an exclusive position in the Slovak Republic, especially in expertise processing in the field of analysis and synthesis of railway interlocking systems.

The sphere of reliable and safe information transmission and processing in control of selected critical processes both in safety-related systems for all kinds of transport, complex technologies and in security systems for protection of humans and property provides dynamic incentive for all the staff. Realization of information services for operative control supported by automation and computer technology is applicable in decisive branches of the national economy.

Activities performed at the DCIS are integrated to the national and international co-operation with academic and industry sphere and realized through various forms - from research projects to exchanges of students and experts.

In 2011 the staff of the DCIS consisted of 16 pedagogical workers, 2 technicians and administrative support, 2 researchers and 13 full-time postgraduate students. The pedagogical staff consisted of 4 professors, 1 guest professor, 2 associate professors, 6 senior lecturers with an academic degree PhD, 3 senior lecturers without this degree.

### 2 Staff of the Department

Head of the Department:	Juraj Spalek
Vice-head of the Department:	Aleš Janota
Department secretary:	Rastislav Pirník
Study Consultant:	Peter Nagy
Administrative Support:	Klára Berešíková
Technical Support:	Kamila Kršíková
Researchers:	Martin Čapka, Rastislav Pirník

#### 2.1 Sections of the Department

##### 2.1.1 Section of Automation and Signalling Systems

Head of the Section:	Karol Rástočný
Professors:	Aleš Janota, Karol Rástočný, Juraj Spalek
Guest Professor:	Pavel Příbyl
Senior Lecturers (with PhD):	Jozef Hrbček, Vojtech Šimák, Juraj Ždánsky
Senior Lecturers (without PhD):	Peter Nagy

##### 2.1.2 Section of Communication and Information Systems

Head of the Section:	Mária Franeková
Professors:	Mária Franeková

Associate Professors: Václav Končelík, Ľudmila Muzikářová  
 Senior Lecturers (with PhD): Tatiana Brončeková, Peter Vestenický; Peter Peniak  
 Senior Lecturers (without PhD): Emília Bubeníková, Peter Holečko

### 2.1.3 Postgraduate Students

Internal (full-time): Michal Gregor; Tomáš Mikluščák; Ľubomír Pekár; Ján Halgaš; Peter Matis; Zuzana Lobotková; Juraj Ilavský; Marek Výrostko; Juraj Ľupták; Tibor Moravčík; Tomáš Ondrašina; Ján Čapák  
 External (part-time): Peter Holečko; Peter Chrtiansky; Pavol Mrmus; Milan Slivka; Ján Slezák; Peter Nagy; Emília Bubeníková; Anna Cerovská; Peter Lúley

## 3 Teaching

### 3.1 Courses in Bachelor and Master Degree Programmes

#### 3.1.1 Bachelor Degree Programmes

Code Title	Lessons-Seminars-Exercises		
	Semester	hours/week	Teachers
<i>Courses at the Faculty of Electrical Engineering</i>			
31100 Algorithmisation of problems	1	2-2-0	Brončeková Čapka
31209 Programming languages 1	1	2-2-0	Brončeková
31202 Information communication networks	2	1-0-2	Pirník
31204 Computing technical environment	2	1-0-2	Vestenický
31425 Logical systems	4	3-1-1	Ždánsky
31437 Control systems	4	2-1-2	Spalek
31443 Theory of automated control 1	4	3-1-1	Hrbček Bubeníková
31444 Theory of signals and systems	4	3-1-1	Muzikářová Bubeníková
31534 Single-chip controllers programming	5	2-0-2	Končelík
31504 Bachelor project	5	0-0-5	Franeková Muzikářová Vestenický Ždánsky
31521 Communication security	5	3-1-1	Franeková
31536 Sensor technology	5	3-1-1	Janota
31541 Control systems reliability and safety	5	3-2-0	Rástočný
31600 Bachelor work	6	0-2-0	Franeková Muzikářová Vestenický Ždánsky
31606 Distributed control systems	6	3-1-1	Franeková Vestenický
31612 Information systems	6	3-1-1	Nagy
31623 Control systems programming	6	1-0-2	Ždánsky
<i>Courses at the Faculty of Civil Engineering</i>			
92347 Applied electronics	2	2-0-2	Nagy
92347 Applied electronics (External Study)	2	18-0-0	Nagy

## 3.1.2 Master Degree Programmes

Code	Title	Lessons-Seminars-Exercises		Teachers
		Semester	hours/week	
<i>Courses at the Faculty of Electrical Engineering</i>				
32101	Control systems safety analyses	1	3-2-0	Rástočný
32103	Information systems security	1	3-1-1	Holečko Peniak
32120	Computer networks	1	3-1-1	Vestenický
32124	Safety systems components	1	3-1-1	Nagy
32130	Theory of automated control 2	1	3-1-1	Hrbček
32142	Signal processing appliances	1	3-1-1	Muzikářová
32202	Higher programming languages applications	2	2-1-2	Holečko
32203	Secure system communication	2	3-1-1	Franeková
32214	Information systems in medicine	2	2-0-2	Brončeková
32221	Object-oriented system development	2	2-0-2	Rástočný Janota
32225	Signal processing appliances	2	3-1-1	Muzikářová
32238	Artificial intelligence	2	2-0-2	Spalek
32243	Safety systems	2	3-1-1	Rástočný
32301	Safety systems applications	3	3-0-2	Nagy
32302	Safety systems	3	3-0-2	Nagy
32311	Expert systems	3	3-0-2	Janota
32312	Fuzzy control	3	3-1-1	Spalek
32316	Master project	3	0-0-5	Končelík Muzikářová Spalek
32342	Processes visualisation	3	3-1-1	Ždánsky
32400	Information systems applications	4	3-0-2	Peniak Vestenický
32401	Wireless communication	4	3-1-1	Vestenický
32402	Diploma work	4	0-0-0	head of DW.
32403	Diploma project	4	0-0-10	head of DW.
32411	Intelligent transportation systems	4	3-2-0	Spalek Janota, Příbyl
32417	Artificial intelligence programming	4	3-2-0	Janota
<i>Courses at the Faculty of Civil Engineering</i>				
96417	Communication and safety technologies	2	2-1-0	Nagy
<i>Courses at the Faculty of Operation and Economics of Transport and Communications</i>				
13P102	Information systems in transport	1	2-2-1	Čapka

## 4 Educational, Research and Scientific Projects

### 4.1 National Projects

#### 4.1.1 Research Projects Funded by the Scientific Grant Agency of the Slovak Republic (VEGA)

*VV\_VEGA – 1/0392/10 Research of mobile nodes localisation in wireless sensor networks*

Coordinator: Peter Brída (DTaM)  
Co-operators: Peter Vestenický

#### 4.1.2 Research Projects Funded by the Slovak Research and Development Agency (APVV)

*APVV VMSP-P-0142-09 "Development, research and implementation of supplemental road signalling for safety on railway crossings and cross walks" in cooperation with ARDOS AZ, Inc. (2009 – 2011)*

Coordinators: Juraj Spalek (for UoŽ),  
Co-operators: Aleš Janota; Rastislav Pirník; Peter Nagy; Peter Matis

*APVV SK-PL-0015-09 Safety appraisal of railway safety systems*

Coordinators: Karol Rástočný  
Co-operators: Mária Franeková, Peter Nagy

#### 4.1.3 Other National Projects – European social fund project ITMS

*Flexible and attractive study on the University of Žilina for the needs of labour market and knowledge society*

Coordinator: Ivo Čáp  
Co-operators: Tatiana Brončeková

*Systemisation of advanced technologies and knowledge transfer between industrial sphere and university environment ITMS 26110230004*

Co-operators: Emília Bubeníková

*Centre of excellence for intelligent transport systems and services I. European structural fund project and Ministry of Education of SR – ITMS project code: 26220120028*

Coordinator: Karol Matiaško (FoCI)

Activity 1.1: Juraj Spalek (Coordinator), Mária Franeková, Peter Vestenický, Martin Čapka, Rastislav Pirník, Vojtech Šimák

Activity 1.2: Karol Rástočný, Rastislav Pirník

Activity 1.3: Aleš Janota, Jozef Hrbček

*Centre of excellence for intelligent transport systems and services II. European structural fund project and Ministry of Education of SR – ITMS project code: 26220120050*

Coordinator: Karol Matiaško (FoCI)

Activity 1.1: Juraj Spalek (Coordinator), Mária Franeková, Peter Vestenický, Martin Čapka, Rastislav Pirník, Vojtech Šimák

Activity 1.2: Karol Rástočný, Rastislav Pirník

Activity 1.3: Aleš Janota, Jozef Hrbček

*New measurement methods for physical dynamical parameters and interactions of traffic stream motor vehicles and roadway – project code: 26220220089, 2010-2014*

Coordinator: Aleš Janota

Co-operators: Juraj Spalek, Mária Franeková, Peter Vestenický, Martin Čapka, Rastislav Pirník, Jozef Hrbček, Vojtech Šimák, Tatiana Brončeková, Peter Holečko, Ľudmila Muzikářová, Emília Bubeníková, Kamila Kršíková, Klára Berešíková

*Development of modular robotic systems - VMROS – ITMS project code: 26220220049, 2010-2011*

Coordinator: Milan Gregor (FoCE)

Co-operators: Juraj Spalek, Aleš Janota

*Intelligent modular system for components quality control - InMoSysQC - ITMS project code: 26220220009, 2007-2013*

Coordinator: Branislav Mičieta (FoCE), Milan Gregor (FoCE)

Co-operators: Mária Franeková, Aleš Janota, Juraj Spalek.

*Competence centre for research and development in the area of diagnostics and therapy of oncologic diseases, ITMS code: 26220220153*

Recipient: Comenius University in Bratislava/ Jessenius medicine faculty in Martin

Coordinator for UoŽ: Ján Michalík

Coordinator of Activity 2.3: Róbert Hudec (KtAM)

Project manager for UoŽ: Martin Čapka

Co-operators: Róbert Hudec, Miroslav Benčo, Martin Brežňan, Branko Babušiak, Ján Barabáš, Michal Gála, Roman Radil

*Centre for translational medicine - ITMS project code: 26220220021:*

Recipient: Comenius University in Bratislava

Project partner: University of Žilina

Co-operators: Mária Franeková

#### 4.1.4 Other International Projects

*Safety appraisal of track safety device EAH-08 (Cooperation agreement on research activity Nr. 1/2010 between SignalBau Přerov and University of Žilina)*

Coordinator: Karol Rástočný

Co-operators: Peter Nagy, Juraj Ždánsky, Juraj Ilavský

*A-0930-RT-GC Helicopter fuselage crack monitoring and prognosis through on-board sensor (HECTOR), European Defence Agency*

Coordinator: Róbert Hudec (KtAM)

Co-operators Peter Vestenický – leader of Work Package 4.2 and member of co-operator collective

## 5 Co-operation

### 5.1 Co-operation Partners in Slovakia

- ADAC – Allgemeiner Deutscher Automobil – Club e. V, Germany
- ADOTEL-HEX Ltd., Automatizácia dopravy a telekomunikácií (Transportation and telecommunications automation), Žilina
- ANDIS Ltd., Analógové a digitálne systémy (Analog and digital systems), Bratislava
- ARDOS AZ Inc., Bratislava



- B+R automatizace, Ltd. – organisation section, Nové Mesto nad Váhom
- Betamont Ltd., Zvolen
- CONTAL. Ltd., Žilina
- ELISS, Ltd., Žilina
- ESA Solution Ltd., Žilina
- Faculty of Electrical Engineering and Information Technology, Slovak Technical University, Bratislava
- Faculty of Electrical Engineering and Information Technology, Technical University, Košice
- Faculty of Mechanical Engineering, Technical University, Košice
- HELDIS Ltd., Ružomberok
- National highway company (Národná diaľničná spoločnosť a. s.), Bratislava
- Siemens PSE Bratislava
- Siemens Rail Automation Engineering, Žilina
- Scheidt&Bachmann Slovensko Ltd., Žilina
- Skytoll Inc., Bratislava
- SOMI Systems Inc., Banská Bystrica
- Slovak Standards Institute, Bratislava
- Technical university Košice
- Transportation research institute, Žilina
- Intelligent transportation systems association (Združenie Inteligentné dopravné systémy Slovensko), Bratislava
- Želsys Inc., Bratislava
- ŽSR (Slovak Railways), Bratislava

## 5.2 International Co-operation Partners

- ADAC – Allgemeiner Deutscher Automobil – Club e. V, Germany
- AŽD Praha Ltd., Prague, CR
- DE BUELE Technics, Hamme, Belgium
- ELTODO EG, Prague, CR
- Faculty of Transportation, Czech Technical University, Prague, CR
- HTE – Scientific Association for Infocommunications, Budapest, Hungary
- První Signální Inc., Ostrava, CR
- Transport telematics association (SDT – Sdružení pro dopravní telematiku), Prague, CR
- Scheidt&Bachmann, Mönchengladbach, Germany
- SIEMENS AG, Transportation Systems, Vienna, Austria
- Siemens Ltd. – Building Technology, Bratislava
- Signalbau Inc., Přerov, CR
- Thales Rail Signalling Solutions GmbH, Vienna, Austria

## 5.3 Visitors to the Department

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Białoń Andrzej	Centrum naukowo-techniczne kolejnictwa, Warszawa, PL	7 days
Braband Jens	Siemens AG, Braunschweig, Germany	1 day
Faltus Vladimír	FT TU Prague, CR	2 days
Kunhart Milan	AŽD Praha, CR	5 days
Mikulski Jerzy	Politechnika Śląska, Wydział Transportu, Katowice, Poland	11 days
Mlynczak Jakub	Politechnika Śląska, Wydział Transportu, Katowice, Poland	7 days
Tarnai Géza	TU Budapest, Hungary	1 day
Zářecký Stanislav	První Signální, Ostrava, CR	2 days
Žilka Jiří	První Signální, Ostrava, CR	2 days

#### 5.4 Visits to Foreign Institutions

Name	Institution	Length of stay
Čapka Martin Franeková Mária	Conference & Exhibition Intelligent Cities Expo, Hamburg, G	3 days
	Silesian University of Technology, Faculty of Transport, Katowice, Poland	2 days
Janota Aleš	Faculty of Transportation, Czech Technical University, Prague, CR	1 day
	Politechnika Sliezska Katowice-Ustroń, Poland	2 days
	Faculty of Transportation, Czech Technical University, Prague, CR	2 days
	Eltodo Prague, CR	2 days
	DC TUD-COST, Warsaw, Poland	2 days
	TU Braunschweig	2 days
	DC TUD-COST, Vienna, Austria	3 days
	DC TUD-COST, Ohrid, Macedonia	3 days
	Conference & Exhibition Intelligent Cities Expo, Hamburg, D	4 days
	Politechnika Radomska, Radom, Poland	1 day
Nagy Peter	Operational control centre Czech Railways, Přeřov, CR	1 day
	Thales Vienna, Austria	1 day
Pirník Rastislav	Intertraffic 2011 – conference and exhibition, Istanbul, Turkey	4 days
	Katowice-TST 2011 – conference, Ustroń, Poland	3 days
Rástočný Karol	Conference & Exhibition Intelligent Cities Expo, Hamburg, D	4 days
	TU Katowice (Ustroń), Poland	4 days
	AŽD Prague (Pardubice), CR	6 days
	TU Budapest, Hungary	3 days
	TU Katowice, Poland	3 days
	Thales Vienna, Austria	1 day
Spalek Juraj	Workshop Developing European Transport Research Alliance, Prague CR	1 day
	Conference & Exhibition Intelligent Cities Expo, Hamburg, D	4 days
	Eltodo EG, Inc., FT Technical university Prague	2 days

#### 5.5 Contracts (Business Activities)

Contract number:	466/2011
Contract name:	Technical normalization plan 2010: Railway applications. Communication and signaling systems and data processing systems. Communication related to security in transmission systems. Adoption of EN in English into STN - translation.
Customer:	SÚTN, Bratislava
Coordinator:	Mária Franeková
Contract number:	P-103-0012/11
Contract name:	Extension of existing overall appraisal for electronic interlocking boxes in Slovakia (corrections of V44K100309R351 version of migration phase)
Customer:	SIEMENS AG, Österreich, I MO RA ML SEE, Siemensstr. 90, 1211 Vienna, Austria
Project duration:	2011
Coordinator:	Karol Rástočný

Contract number:	P-103-0019/10
Contract name:	Methodics for functional behaviour creation of RBCC
Customer:	AŽD Praha, Ltd., Technology - Research and development, Žirovnická 2/3146, 106 17 Prague 10,
Project duration:	2010-2011
Coordinator:	Karol Rástočný
Contract number:	P-103-0006/11
Contract name:	Appraisal of creation process of functional behaviour model of RBCC – analytic part
Customer:	AŽD Praha, Ltd., Technology - Research and development, Žirovnická 2/3146, 106 17 Prague 10
Project duration:	2011
Coordinator:	Karol Rástočný
Contract number:	350/2/2011
Contract name:	Analysis of methodical and technical conditions (TP) and design of new TP relevant with the NSDI project.
Customer:	Transportation research institute Inc. (Výskumný ústav dopravný), Žilina
Coordinator:	Rastislav Pirník
Co-operators:	Juraj Spalek, Aleš Janota, Pavel Příbyl
Contract number:	P-103-0003/11
Contract name:	Educational training for KIA Motors Slovakia Ltd. on ControlLogix and PVP system
Customer:	Rockwell Automation Slovakia Ltd.
Coordinator:	Juraj Ždánsky
Co-operators:	Jozef Hrbček
Contract number:	P-103-0010/11
Contract name:	Educational training for KIA Motors Slovakia Ltd. on ControlLogix and PVP system
Customer:	Rockwell Automation Slovakia Ltd.
Coordinator:	Juraj Ždánsky
Co-operators:	Jozef Hrbček.

## 6 Other Activities

### 6.1 Conferences, Workshops, Symposiums Organized by the Department

- 19<sup>th</sup> International symposium EURNEX - Žel 2011 "New challenges for European railways", 8<sup>th</sup> – 9<sup>th</sup> June 2011, Žilina, SR (organising committee chairman: Karol Rástočný, organising committee member: Peter Nagy)
- Workshop Concretization of cooperation form based on frame contract SkyToll – UoŽ, 8<sup>th</sup> February 2011, University of Žilina (coordinator: Rastislav Pirník)
- Excursion for 1<sup>st</sup> class MSc. degree students of Process control study programme at the railway station Vrútky – freight st. (electromech. interlocking device, mechanized hump yard), 10<sup>th</sup> May 2011 (Peter Nagy)
- Excursion for 2<sup>nd</sup> class MSc. degree students of Process control study programme at the railway stations Krásno nad Kysucou and Čadca – electronic interlocking devices Siemens SIMIS W, AŽD ESA 33 and Bombardier Ebilock 950, 26<sup>th</sup> November 2011 (Peter Nagy)

- Excursion for 2<sup>nd</sup> class MSc. degree students of Process control study programme at the railway station Vrútky – relay interlocking device with digital selection, 5<sup>th</sup> December 2011 (Peter Nagy)
- Excursion for 2<sup>nd</sup> class MSc. degree students of Process control study programme at the Traffic control centre of Czech Railways in Přerov – control system AŽD DOZ 1, 9<sup>th</sup> December 2011 (Peter Nagy)

## 6.2 Specialised Lectures, Courses Organized by the Department

*Dynamic weighting of traffic flow and its utilisation in praxis* – expert course under the auspices of Ministry of Transportation, Building and Regional Development of Slovak republic

Customer: Betamont, Ltd., Zvolen  
Guarantee: Juraj Spalek  
Date: 22<sup>nd</sup> – 23<sup>rd</sup> June 2011

*Information systems security management*

Customer: Lecture for students of Safety process engineering study program  
Lecturer: Martin Šuták; GiTy Inc., Martin  
Date: 24<sup>th</sup> October 2011

*Fundamentals of traffic engineering. ICT – Information acquisition, processing and interpretation. ICT in transportation, chosen technologies, NDIC.* – lectures for students of accredited educational programme of further education guaranteed by the Faculty of Operation and Economics of Transport and Communications

Customer: Public administration and Police forces of SR  
Lecturer: Aleš Janota  
Date: June 2011

*Centralised control of railway traffic*

Target group: students and employees of DCIS  
Lecturer: Géza Tarnai

## 6.3 Invited Lectures/Papers

*Safety appraisal of safety systems. (Biztosítóberendezések biztonságának értékelése)*

Lecturer: Karol Rástočný; Izabela Krbilová  
Where/When: TU Budapest, March 2011

*ITS Communication Infrastructure*

Lecturer: Rastislav Pirník  
Where/When: Faculty of Mechanical Engineering, University of Žilina, 5<sup>th</sup> April 2011

*Safety evaluation of data transmission within safety-related control systems*

Lecturer: Mária Franeková  
Where/When: Silesian University of Technology, Faculty of Transport, Katowice, Poland, 12<sup>th</sup> May 2011

*Safety analyses of safety - related control system for railway signalling applications*

Lecturer: Karol Rástočný  
Where/when: TU Katowice, May 2011

#### 6.4 Membership in International Institutions/Committees

Franeková Mária

- member of Programme Committee of 11<sup>th</sup> International conference *Transport Systems Telematics TST'11*, Katowice-Ustroń, Poland : 19<sup>th</sup> – 22<sup>nd</sup> October 2011
- member of Editorial Board of International scientific magazine *Advances in Electrical and Electronic Engineering*, Poland, ISSN 1804-3119
- member of Editorial Board of International scientific magazine *Archives of Transport System Telematics*, CR, ISSN 189-8208

Janota Aleš

- member of DC TUD COST - Domain Committee for Transport and Urban Development – European Cooperation in Science and Technology, Brussels
- member of Programme Committee of 11<sup>th</sup> International conference *Transport Systems Telematics TST'11*, Katowice-Ustroń, Poland : 19<sup>th</sup> – 22<sup>nd</sup> October 2011
- member of Programme Committee 9<sup>th</sup> International Navigational Symposium on Marine Navigation and Safety of Sea Transportation Trans-Nav 2011, Gdynia, Poland: 15<sup>th</sup> 17<sup>th</sup> June 2011
- member of Programme Committee 15<sup>th</sup> international conference “Computer Aided Science, Industry and Transport” TRANSCOMP 2011, Zakopané, Poland: 5<sup>th</sup> – 8<sup>th</sup> December 2011
- chairman of Editorial Board of international scientific magazine *Archives of Transport System Telematics*, Poland ISSN 1899-8208
- member of Scientific Board of Faculty of Transport and Electrotechnics, Politechnika Radomska, Radom, Poland
- member of ACM – Association for Computing Machinery, USA
- member of International Institute of Informatics and Systemics, USA

Rástočný Karol

- member of Programme Committee of 11<sup>th</sup> International conference *Transport Systems Telematics TST'11*, Katowice-Ustroń, Poland : 19<sup>th</sup> – 22<sup>nd</sup> October 2011
- member of Programme Committee of 9<sup>th</sup> International conference *IEEE Applied Electronics*, Pilsen, CR: 7<sup>th</sup> – 8<sup>th</sup> September 2011
- member of Editorial Board of international scientific magazine *Transport Problems*, ISSN 1896-0596
- member of Editorial Board of international scientific magazine *Archives of Transport System Telematics*, ISSN 1899-8208
- member of Editorial Board of international scientific magazine *Advances in Electrical and Electronic Engineering*, Poland, ISSN 1804-3119

Spalek Juraj

- vice chief editor of *Annals of Faculty Engineering Hunedoara – Journal of engineering scientific magazine*, ISSN 1584-2665; Index COPERNICUS – Journal Master List, available on the internet <<http://journals.indexcopernicus.com>>, Genamics JournalSeek database, available on the internet <<http://journalseek.net/>>, <http://annals.fih.upt.ro/associateeditors.html>
- member of Scientific Board *ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering*, e-ISSN: 2067-3809, Edited by Faculty of Engineering Hunedoara University Politehnica Timisoara, <http://acta.fih.upt.ro/bibliographic-info.html>
- member of Programme Committee of international scientific magazine *Archives of Transport System Telematics*, Polish Association of Transport Telematics, ISSN 1899-8208
- member of Programme Committee of 11<sup>th</sup> International conference *Transport Systems Telematics TST'11*, Katowice-Ustroń, Poland : 19<sup>th</sup> – 22<sup>nd</sup> October 2011
- member of appraisal team of symposium and multiconference The 8<sup>th</sup> International Symposium on Risk Management and Cyber-Informatics: RMCI 2011 In the Context of The 15th Multi-conference on Systemics, Cybernetics and Informatics: WMSCI 2011 July 19 - 22, 2011, Orlando, Florida, USA

## 6.5 Membership in National Institutions/Committees

Franeková Mária

- member of Technical standardisation committee nr. 83, Slovak Institute of Technical Standardisation, Bratislava
- member of PROFIBUS.sk association, FEI STU Bratislava
- member of SSKI association (Slovak society for cybernetics and informatics), SAS Bratislava

Janota Aleš

- member of Technological standardisation committee TK 104 Control of industry processes, Slovak Institute of Technical Standardisation (SÚTN) Bratislava
- member of Programme Board of 19<sup>th</sup> International symposium EURNEX - Žel 2011 "New challenges for European railways", 8<sup>th</sup> – 9<sup>th</sup> June 2011, Žilina, SR

Rástočný Karol

- member of Programme Board of International conference on railway communication and interlocking technology, Vyhne: 9<sup>th</sup> – 11<sup>th</sup> February 2011
- member of Programme Board of 19<sup>th</sup> International symposium EURNEX - Žel 2011 "New challenges for European railways", 8<sup>th</sup> – 9<sup>th</sup> June 2011, Žilina, SR
- member of Organising Board of 19<sup>th</sup> International symposium EURNEX - Žel 2011 "New challenges for European railways", 8<sup>th</sup> – 9<sup>th</sup> June 2011, Žilina, SR
- member of Technological standardisation committee Nr. 83, SÚTN Bratislava
- member of Editorial Board of AT&P journal, ISSN 1335-2237, SR

Spalek Juraj

- member of Slovak Society for Informatics and Cybernetics (SSKI)
- member of Slovak Society for Applied Cybernetics and Informatics (SSAKI)
- member of Working Group for technical sciences of Slovak Research and Development Agency (SRDA)
- member of Intelligent Transportation Systems Association Slovakia

## 6.6 Membership in University Boards

Bubeníková Emília

- member of executorial board of KAP FEE association

Franeková Mária

- chairman of KAP EF association
- member of Branch Committee of 5.2.14 Automation at the FEE University of Žilina
- member of Organisational Board of Children university of Žilina, 11<sup>th</sup> – 15<sup>th</sup> July 2011

Janota Aleš

- member of Scientific Board of FEE University of Žilina
- member of Branch Committee for science branch 5.2.14 Automation
- faculty coordinator of Erasmus programme

Rástočný Karol

- chairman of Branch Committee for study branch 5.2.14 Automation
- member of Scientific Board of FEE University of Žilina
- member of FEE University of Žilina senate

Spalek Juraj

- member of Editorial Board of scientific magazine *Advances in Electrical and Electronic Engineering* (AEEE)
- member of Scientific Board of University of Žilina
- member of Scientific Board of FEE University of Žilina
- member of Scientific Board of FME University of Žilina
- member of Branch Committee 5.2.14 Automation FEE University of Žilina
- member of Scientific Board of 9<sup>th</sup> European Conference of Young Research and Scientific Workers in Transport and Telecommunications TRANSCOM 2011, 27<sup>th</sup> - 29<sup>th</sup> June 2011, section Information and Communication Technologies, Žilina

- member of Programme Board ICCIT 2011 (International Conference on Cybernetics and Information Technologies), 14<sup>th</sup> – 15<sup>th</sup> September 2011, Terchová, SR
- member of Scientific Board of International seminar Middle European School of Doctor Study 20<sup>th</sup> – 22<sup>nd</sup> September 2011, Trenčianske Teplice

## 6.7 Awards

Janota Aleš: Silver medal for long-term cooperation granted by the president of ELTODO Prague company Msc. Libor Hájek 21<sup>st</sup> November 2011 on the occasion of 20<sup>th</sup> anniversary of company

Spalek, Juraj: Thankful letter from the director of strategy section of Ministry of Transport of Czech republic Luděk Sosna, PhD. Nr. 19/2011-520-TPV/2 from 27<sup>th</sup> January 2011 for long-term opponent work of research projects within the research programme „Support of realisation of a sustainable transportation development“.

Spalek Juraj: Silver medal for long-term cooperation granted by the president of ELTODO Prague company Libor Hájek 21<sup>st</sup> November 2011 on the occasion of 20<sup>th</sup> anniversary of company

Spalek, Juraj: Thankful letter from the director of Research and development support agency of Ministry of Education SR (APVV) for a successful cooperation in year 2011. Bratislava

## 7 Publications

### 7.1 Conference Proceedings Reviewed

- contributions published in reputable foreign publisher or published by worldwide reputable scientific institutions

- [1] GAVULOVÁ, A. - PIRNÍK, R. - HUDEC, R.: Technical support of traffic control system of Slovak agglomerations in NaTIS project. In: *Modern transport telematics 11th international conference on transport systems telematics*, TST 2011, Katowice-Ustrón, Poland, October 2011, selected papers. - Berlin Heidelberg: Springer-Verlag, 2011, ISBN 978-3-642-24659-3. - pp. 382-391. AEC
- [2] GAVULOVÁ, A. - PIRNÍK, R.: Design of urban intelligent transport systems in Slovak conditions. In: *Reliability and Statistics in Transportation and Communication (RelStat' 11)* the 11th international conference, 19-22 October 2011, Riga, Latvia proceedings. - Riga: Transport and Telecommunication Institute, 2011. ISBN 978-9984-818-46-7. pp. 266-274. AFC
- [3] GREGOR, M. – SPALEK, J.: Fitness-based Adaptive Control of Parameters in Genetic Programming. Proc. of 2011 *IEEE International Conference on Intelligent Computing and Intelligent Systems (ICIS 2011)*, November 18-20, 2011, Guangzhou, China, IEEE Catalogue Number: CFP1157H-CDR, ISBN 978-1-61284-143-4, pp. 340-344 (IEEE Xplore and indexed in Ei Compendex)
- [4] HALGAŠ J. – JANOTA, A.: Technical Devices Cooperation to Obtain Data for 3D Environment Modelling. In: *Communications in Computer and Information Science 239, Modern Transport Telematics*, Springer-Verlag Berlin Heidelberg 2011 (pp. 330-337), 2011, ISSN 1865-0929, ISBN 978-3-642-24659-3, e-ISSN 1865-0937, e-ISBN 978-3-642-24660-9
- [5] RÁSTOČNÝ, K. – ILAVSKÝ, J.: Effects of a periodic maintenance on the safety integrity level of a control system. In: *Proceeding of the 8th Symposium on Formal Methods for Automation and Safety in Railway and Automotive Systems FORMS / FORMAT 2010*. Braunschweig. pp. 77-85, Berlin, Springer-Verlag, 2011. - ISBN 978-3-642-14260-4 (in Springer-Verlag database)

- [6] LOBOTKOVÁ, Z. – JANOTA, A.: Petri Net-based Functional Representation of a Level Crossing. Communications in Computer and Information Science 239, In: *Modern Transport Telematics*, Springer-Verlag Berlin Heidelberg 2011 (pp. 118-125), 2011, ISSN 1865-0929, ISBN 978-3-642-24659-3, e-ISSN 1865-0937, e-ISBN 978-3-642-24660-9
- [7] NAGY, P.: EURO-ŽEL 2011: 19th International Symposium "Recent Challenges for European Railways": Proceedings – editor of printed version / Peter Nagy. - Prvé. - Brno : Tribun EU, 2011. - 430. ISBN 978-80-263-0003-8
- [8] NAGY, P.: EURO-ŽEL 2011 : 19th International Symposium "Recent Challenges for European Railways" : Proceedings – editor of electronic version / Peter Nagy. - Prvé. - Brno: Tribun EU, 2011. - 430. ISBN 978-80-263-0003-8
- [9] RÁSTOČNÝ, K. – ILAVSKÝ, J.: Effects of recovery on the safety of a safety-related control system. In: *Proceeding of the International Conference on Applied Electronics*, AE 2011; Pilsen, 2011, pp. 321 -324, ISSN: 18037232, ISBN: 978-807043987-6 (in IEEE and Scopus databases)
- [10] PALECEK, J. - VESTENICKY, P. - VESTENICKY, M. - SPALEK, J.; "Optimization of microstrip filter dimensions by differential evolution algorithm," Intelligent Engineering Systems (INES), 2011 15th IEEE International Conference on Intelligent Engineering Systems INES 2011, June 23th – 25th 2011, Poprad, Slovakia, pp. 173 – 176. ISBN 978-1-4244-8954-1.(IEEE Explore)
- [11] RÁSTOČNÝ, K. – ILAVSKÝ, J.: What Is Concealed behind the Hazardous Failure Rate of a System? In: *Communications in Computer and Information Science*, Volume 104: Modern Transport Telematics. ISSN 1865-0929. Berlin: Springer-Verlag, 2011. ISBN 978-3-642-24660-9. (2011), pp. 372-381 (in Springer-Verlag and Scopus databases)
- foreign international conference with international programme board in world language
- [12] MORAVČÍK, T. – MUZIKÁŘOVÁ, L.: Eye Blink Analysis for Detection of Human Fatigue in Video Sequence, In: *RTT-2011*, ISBN 978-80-214-4283-2
- [13] VÝROSTKO M.: Cryptography algorithms and their safety evaluation in ERTMS system. Applications In: *XIII International PhD Workshop OWD 2011*. Conference archives PTETiS vol.29 2011, Wisla, Poland. ISBN:83-922242-8-0
- national conference with international programme board in world language
- [14] CEROVSKÁ, A. – SPALEK, J.: Influence of overloaded and over-dimensioned heavy traffic to traffic flow safety in road tunnels, In: *9th European Conference of Young Research and Scientific Workers in Transport and Telecommunications TRANSCOM 2011*, Žilina, 27.-29.6.2011, ISBN 978-80-554-0369-4, pp. 11-14
- [15] HALGAŠ, J. – JANOTA, A.: Introductory Notes to Design of 3D Model of Road Communication for Intelligent Transport System Applications. In: *Proc. of the Central European School of Doctoral Study*, Trenčianske Teplice, Slovakia: September 20-22, 2011 (pp. 88-92). ISBN 978-80-554-0421-9
- [16] HALGAŠ, J. - JANOTA, A.: Use Two-dimensional Scanner to Capture Points of Space. In: *Proc. of the 9th European conference of young research and scientific workers TRANSCOM 2011*, Section 1: Transport and Communications Technology, Žilina: June 27-29, 2011 (pp. 55-58). ISBN 978-80-554-0369-4
- [17] ILAVSKÝ, J. - RÁSTOČNÝ, K.: Stochastic safety model of redundant control system with failure detection. In: *Proceeding of the central European school of doctoral study: in the field of power electrical engineering and automation*, pp. 48-52, Trenčianske Teplice, 2011, ISBN 978-80-554-0421-9
- [18] ILAVSKÝ, J.: Failure and Failure Detection Effects on the Safety of a Safety-relevant Control System. In: *9-th European conference Transcom 2011*, Žilina. ISBN 978-80-554-0369-4



- [19] LOBOTKOVÁ, Z.: Different Approaches to Determine Level Crossing Protection. In: *Proceedings of the 9th European conference of young research and science workers TRANSCOM 2011*, Žilina: June 27-29, 2011. ISBN 978-80-554-0369-4
- [20] LOBOTKOVÁ, Z. – JANOTA, A.: Level Crossing Risk from the Viewpoint of Individual Factors. In: *Proc. of the Central European School of Doctoral Study*, Trenčianske Teplice, Slovakia: September 20-22, 2011 (pp. 61-64). ISBN 978-80-554-0421-9
- [21] L'UPTÁK, J.: Safety Mechanisms and Solutions within Profile OpenSafety. In: *Proceedings of the international conference TRANSCOM 2011, 9-th European Conference. 27-29.6.2011*, Žilina ISBN: 978-80-554-0369-4
- [22] MATIS, P.: The risk analysis for Slovak road Tunnels. In: *TRANSCOM 2011 9-th. European conference of young research and scientific workers*, University of Žilina, 2011, ISBN 978-80-554-0369-4, pp. 141-144
- [23] ONDRAŠINA, T.: Security Protocols in ZigBee Technology. In: *Proceedings of the international conference TRANSCOM 2011, Volume 9, June 27-29 2011*, Žilina, SR. ISBN 978-80-554-0372-4
- [24] VÝROSTKO M.: Cryptography Protocol Used in EURORADIO System within Railway Applications In: *Proceedings of the international conference TRANSCOM 2011, 9-th European Conference. June 27-29 2011*, Žilina ISBN: 978-80-554-0369-4

- not in world language

- [25] BUBENÍKOVÁ, E. - MORAVČÍK, T.: Image processing technologies, In: *Technologist: journal for theory and praxis of mechanical Technologies: Unconventional Technologies*, - ISSN 1337-8996. - Vol. 3, special edition (June 2011), pp. 51-56. (AFD)
- [26] FRANEKOVÁ, M.: Trends in data transmission security appraisal in safety relevant control systems. In: *Proceedings from the Meeting of cybernetics, measurement, control technology and automation from Czech and Slovak republic 2011*. Vrátna, 6<sup>th</sup> – 8<sup>th</sup> September 2011, SR, pp. 79-87, ISBN 978-80-970760-4-7. AFD.
- [27] FRANEKOVÁ, M.: Trends in automation area in appraisal of safety relevant industrial communication systems. In: *Central European School of Doctoral study. 20<sup>th</sup> – 22<sup>nd</sup> September 2011*, Trenčianske Teplice, Slovakia, pp. 21-26, ISBN 978-80-554-0421-9, AFD

- expert articles in Slovak language, national conference with national programme board
- other
- citations in SCI

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- [78] RÁSTOČNÝ, Karol: OUŘEDNÍČEK, J.: Some Aspects of RBC - OBU Communication. International Symposium EURO-ZEL 2011, Žilina
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## 7.6 Expertise review

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[106] Janota, Aleš: opponent review of dissertation thesis KOPAČKA, M.: Effective robust predictive control of mechatronic systems, 2011 (study branch: 5-2-16 Mechatronics, FME - STU, Bratislava)

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- [113] NAGY, Peter: lector review of contribution to proceedings of XX. international conference “Current problems in railway vehicles PRORAIL 2011”
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- [115] RÁSTOČNÝ, Karol: opponent review of standard STN EN 50159: Railway applications: Communication and signaling systems and data processing systems. Communication relevant with security n transmission systems. Processed for SÚTN Bratislava, 2011
- [116] SPALEK, Juraj: reviews of 4 projects proposals VEGA (Jul - August 2011)
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## 8 Contact Address

Department of Control and Information Systems  
Faculty of Electrical Engineering  
University of Žilina  
Univerzitná 1, 010 26 Žilina  
Slovak Republic  
Phone: +421-41-513 3301  
Fax: +421-41-513 1515  
E-mail: [kris@fel.uniza.sk](mailto:kris@fel.uniza.sk)  
www: <http://kris.uniza.sk/english>

Katedra riadiacich a informačných systémov  
Elektrotechnická fakulta  
Žilinská univerzita  
Univerzitná 1, 010 26 Žilina  
Slovenská republika

## DEPARTMENT OF TELECOMMUNICATIONS AND MULTIMEDIA

### 1 General Information

The Department of Telecommunications was founded in 1967. In first years, activities of the Department were concentrated on circuits' theory and signals, digital and impulse techniques, transmission systems and switching systems, telecommunication networks and their reliability. Aim of the Department has been directed towards following and dictating modern trends in communication technologies. Several new laboratories have been built and education has been gradually increasing in a domain of software oriented-courses. In recent years specialization of the Department has been extended also to area of multimedia technologies including multimedia content development. In 2008 the name of the Department was changed to Department of Telecommunications and Multimedia (DTaM).

At the present, the research and education of the Department of Telecommunications and Multimedia is covered by wide range of activities related to telecommunication, information and multimedia technologies. In the field of telecommunication technologies, attention is focused on communication networks, access technologies, convergence of network technologies with main activities oriented on quality of media services.

Regarding fixed networks technologies, great afford is paid to wideband optical networks, which is joint activity with the Department of Physics. Wireless technologies are directed towards mobile and satellite communications, positioning systems as well as to DVB-x. Other significant research activities are in the area of digital signal processing, the stress is layed upon semantic analysis and recognition of audio – visual content including 3D image/video processing.

Relatively new interdisciplinary area of interest are the multimedia technologies, that are oriented to multimedia content creation. This specialization incorporate the courses on fundamental of image composition, film directing, multimedia editing and postprocessing, etc. The main target of this area is the support of future multimedia services. Regarding number of students that have been studying at the Department, DTaM belongs among the biggest departments and most important of Faculty of Electrical Engineering. DTaM consists of 3 divisions: Telecommunication Groupe, Radiocommunication Group, Digital signal processing Group.

### 2 STAFF

**Head of Department:** Martin Vaculík

**Professors:** Milan Dado  
Martin Vaculík – Head of Department  
Vladimír Wieser – Head of Radiocommunication Group

**Associate professors:** Róbert Hudec – Vice head of Department  
Vladimír Hottmar  
Roman Jarina – Head of Digital Signal Processing Group  
Daša Tichá  
Milan Trunkvalter  
Ladislav Schwartz  
Ján Dúha (part-time)  
Rudolf Hronec (part-time)

Lecturers: Peter Kortiš – Head of Telecommunication Group, Bohumil Adamec, Martin Brezňan, Ivan Dolnák, Jozef Dubovan, Ján Hlubík, Darina Jarinová, Michal Kuba, Miroslav Markovič, Martin Paralič, Slávka Pitoňáková (part-time), Peter Počta, Martin Vestenický, Vladimír Soviar

Secretary: Jozefa Imrišková  
Mariana Kazimírová (presently on maternity leave)

Technical Support: Miloslav Karch, Jozefa Imrišková, Katarína Prokšová

Researchers: Miroslav Benčo, Peter Brída

#### Postgraduate Students

Internal (full-time): Martin Bojmír, Daniel Benedikovič, Tomáš Čakan, Veronika Ďurčeková, Miroslav Frič, Bruno Gardlo, Róbert Gubka, Martin Hric, Michal Chmulík, Dominik Jelšovka, Patrik Kamencay, Ján Litvák, Peter Lukáč, Juraj Machaj, Tomáš Majerech, Slavomír Matuška, Miroslava Mrvová, Juraj Paleček, Štefan Pollák, Miroslav Uhrina, Martina Zachariášová, Jozef Kozák, Martin Šimaliak, Andrej Tkáč

External (part-time): Jozef Benikovský, Ivan Dolnák, František Gáborík, Ladislav Petko, Tomáš Špalek, Zuzana Dubcová

### 3 Teaching

#### 3.1 Courses in Bachelor Degree Programmes

##### 3.1.1 Programme: Telecommunications

Code	Title	Semester	Lectures–Seminars–Lab.exercises		Teachers
			hours/week		
31400	Analog Circuit Systems	4	2 – 1 – 2		Hottmar, Adamec, Vestenický
31420	Communication Technologies 1	4	2 – 0 – 1		Vaculík, Schwartz
31433	Transmission Media	4	3 – 1 – 0		Trunkvalter
31440	Signals and Systems	4	3 – 2 – 0		Kuba
31419	Java - Language and Applications	4	2 – 0 – 2		Benčo
31424	Linear Circuits and Systems	4	2 – 0 – 1		Tichá
31432	Computer Networks 1	4	2 – 0 – 4		Kortiš, Dolnák
31503	Bachelor Project 1	5	0 – 0 – 2		DTaM staff
31522	Communication Technologies 2	5	2 – 0 – 1		Kortiš, Dolnák, Schwartz
31526	Measurement in Telecommunications	5	0 – 0 – 2		Vestenický, Jarinová
31535	Radiocommunication Systems 1	5	2 – 1 – 0		Hottmar, Wieser
31544	Television Technique	5	3 – 1 – 0		Hudec
31515	Electroacoustics	5	3 – 1 – 1		Jarina
31532	Computer Networks 2	5	2 – 0 – 4		Kortiš, Dolnák
31546	Design of Multimedia Web Pages	5	2 – 0 – 2		Markovič
31600	Bachelor Work T	6	0 – 2 – 0		KTaM staff
31603	Bachelor Project 2	6	0 – 0 – 2		KTaM staff
31605	Database Systems	6	4 – 0 – 2		Paralič
31625	Radiocommunication Systems 2	6	4 – 0 – 0		Brída, Jarinová

##### 3.1.2 Programme: Multimedia Technologies

31301	Electroacoustics	3	3 – 1 – 1	Jarina
31308	Image Composition and Stylistics	3	1 – 3 – 0	Soviar
31309	Legal Aspects of Multimedia. Applications	3	1 – 1 – 0	Vaculík
31310	Transmission Techniques	3	2 – 2 – 0	Trunkvalter
31312	Image Composition Project	3	0 – 1 – 2	Soviar
31313	Television Technique	3	3 – 1 – 0	Hudec
31417	Photographic and Film Technology	4	2 – 0 – 2	Soviar
31420	Communication technologies	4	2 – 1 – 0	Schwartz
31435	Audio Production Project	4	0 – 0 – 2	Hlubík
31438	Scriptwriting and Dramaturgy	4	2 – 2 – 0	Soviar, Rolík
31451	Audio Production	4	2 – 0 – 2	Vaculík, Hlubík
31436	Rhetoric	4	1 – 2 – 0	external lecturer
31508	Digital Video and Audio	5	2 – 0 – 2	Vaculík, Hlubík
31539	Group project	5	0 – 0 – 6	Soviar, Hlubík
31546	Design of Multimedia Web Pages	5	2 – 0 – 2	Markovič
31554	Fundamentals of Stage Management	5	2 – 2 – 0	Soviar, Rolík
31506	The Past and Present of Visual Arts	5	2 – 0 – 2	Pitoňáková
31600	Bachelor Work MT	6	0 – 2 – 0	DTaM staff
31631	Final Project	6	0 – 4 – 0	DTaM staff

### 3.2 Courses in Master Degree Programmes

#### 3.2.1 Programme: Telecommunication and Radiocommunication Engineering

Code	Title	Lectures–Seminars–Lab.exercises		Teachers
		Semester	hours/week	
32108	Photonic Communication Systems	1	2 – 0 – 2	Dado, Dubovan, Markovič
32127	Electromagnetic Waves Propagation and Antennas	1	2 – 1 – 0	Hronec, Adamec
32133	Signals and Systems Theory	1	2 – 1 – 1	Kuba
32100	Algorithms and program languages	1	2 – 0 – 2	Paralič
32113	Measurement in Telecommunications 2	1	0 – 0 – 2	Vestenický, Hottmar, Jarinová
32116	Computer Aided Circuits Design	1	1 – 0 – 2	Tichá
32204	Digital Signal Processing 1	2	2 – 0 – 2	Brezňan
32226	Radiocommunication Systems and Networks 1	2	2 – 1 – 1	Wieser
32205	Digital Audio Processing	2	2 – 1 – 0	Jarina
32215	Measurement in Telecommunications 3	2	0 – 0 – 2	Vestenický, Jarinová
32219	Non-linear Circuit Systems	2	2 – 1 – 0	Hottmar, Vestenický
32220	Neural Networks	2	2 – 0 – 1	Kortiš
32232	Circuit Synthesis	2	2 – 0 – 2	Tichá
32239	Fiber Optics	2	2 – 2 – 0	Dubovan, Dado
32242	Enhanced Programming Languages	2	2 – 0 – 2	Paralič
32306	Digital Signal Processing 2	3	2 – 0 – 2	Brezňan
32317	Communication Technologies 3	3	2 – 0 – 1	Vaculík, Kortiš, Dolnák, Schwartz, Wieser
32332	Radiocommunication Systems and Networks 2	3	2 – 0 – 2	Wieser
32322	Microwave Technique	3	2 – 0 – 2	Wieser
32323	Microwave Circuits	3	2 – 1 – 2	Hottmar,

32339	Special Circuit for Communication Systems	3	2 – 2 – 0	Vestenický, Faktorová
32402	Diploma Work	4	0 – 2 – 0	Vestenický
32403	Diploma Project	4	0 – 0 – 2	DTaM staff
32418	Networks Projection and Operation	4	4 – 0 – 2	DTaM staff
32422	Reliability of Telecommunication Systems	4	4 – 0 – 0	Vaculík, Počta, Dubovan, Wieser
32423	Trends in ICT	4	4 – 0 – 0	Schwartz Dado

*Courses at the Faculty of Management Science and Informatics*

5IN007	Signal Transmission	1	2 – 2 – 0	Dado, Kuba
5IP007	Networks Projection	3	2 – 2 – 0	Vaculík, Dubovan, Wieser, Počta

*Courses at the Institute of High Mountain Biology*

62145	Wireless Technology and Radiocommunication	6	2 – 2 – 0	Dúha
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### 3.3 Courses in Doctoral Degree Programmes

Code	Title	Lectures	Seminars	Lab.exercises	Teachers
		hours/week			
32102	Special English	0	2	0	10 Wieser, Jarina
33200	Digital Communication Theory and Application Methods in Telecommunication	2	0	0	10 Čáповá
33201	DSP Theory and Application Methodology in Telecommunication	2	0	0	10 Jarina
33202	Theory of Mobile and Satellite Radio communication Systems	2	0	0	10 Wieser
33203	Antennas Theory and Propagation of EM Waves	2	0	0	10 Trunkvalter
33204	Theory of Fibre and Integrated Optics and Application Methodology in Telecommunications	2	0	0	10 Dado
33205	Theory of Optical Communication Systems and Networks and Application Methodology in Telecommunications	2	0	0	10 Dado
33206	Theory of Telecommunication Operation and Application Methodology in Telecommunications	2	0	0	10 Vaculík
33207	Network Theory and Application Methodology in Telecommunications	2	0	0	10 Vaculík
33208	Analysis and Design Theory of Electronics Circuits	2	0	0	10 Tichá
33104	Dissertation Project I	0	8	0	15 Dado
33106	Dissertation Project III	0	4	0	15 Dado
33105	Dissertation Project II	0	8	0	15 Dado
33107	Dissertation Project IV	0	4	0	15 Dado
33103	Dissertation Exam	1	0	0	30 Dado

## 4 Educational, Research and Scientific Projects

### 4.1 National Projects

#### 4.1.1 Scientific Grant Agency of the Slovak Republic (VEGA)

VEGA–1/0392/10 *Title: The Research of Mobile Nodes Positioning in Wireless Sensor Networks*

Coordinator: Peter Brída

Sub-Coordinator: Ján Dúha

Researchers: Rudolf Hronec, Vladimír Wieser, Darina Jarinová, Jozef Benikovský

VEGA–1/0336/10 *Title: Improvement of QoS Parameters in MANET and Mesh Networks*

Coordinator: Vladimír Wieser

Sub-Coordinator: Ján Dúha

Researchers: Peter Brída, Darina Jarinová, Peter Poloha, Štefan Pollák, Tomáš Čakan

VEGA–1/0570/10 *Title: Algorithms Research for Automatic Analysis of Multimedia Data*

Coordinator: Róbert Hudec

Sub-Coordinator: Miroslav Benčo

Researchers: Roman Jarina, Zuzana Dubcová, Peter Lukáč, Michal Chmulík, Dominik Jelšovka, Miroslav Frič, Martina Zachariášová, Martin Bojmír

VEGA–1/0655/10 *Title: Algorithms for Scanning and Transmission and Reconstruction of 3D Picture in 3D IP TV*

Coordinator: Roman Jarina

Sub-Coordinator: Martin Brežňan

Researchers: Peter Počta, Dominik Jelšovka, Patrik Kamencay

VEGA–1/0411/10 *Title: Study of Alternative Solutions for Mitigation of Polarisation Mode Dispersion in High-Speed Optics Networks*

Coordinator: Jarmila Müllerová

Researchers: Milan Dado, Jozef Dubovan, Miroslav Markovič

#### 4.1.2 Slovak Research and Development Agency (APVV)

APVV–LPP–0126–09 *Title: Progressive Mobile Positioning in Indoor Environment by Means of Wireless Networks*

Coordinator: Ján Dúha, Supervisor - Peter Brída

Research fellow: Juraj Machaj

APVV–LPP–0216–09 *Title: The Science and Research Popularisation in ICT Technology Area at Secondary Technical Schools*

Coordinator: Róbert Hudec

Co-operators: Martin Vaculík, Peter Brída, Martin Paralič, Peter Počta, Miroslav Benčo, Jozef Dubovan, Ján Hlubík

APVV–0349–010 *Názov projektu: Towards Electromagnetic Induction Based Methods to Meet their True Potential in Non-destructive Monitoring of Conductive Structures*

Coordinator: Ladislav Janoušek

Researchers: Róbert Hudec, Miroslav Benčo

## 4.1.3 Projects of European Structural Funds

26220120028 *Title: Centrum of excellence for Systems and Services of Intelligent Transport I*

Coordinator: Milan Dado

Researchers: Martin Vaculík, Roman Jarina, Róbert Hudec, Peter Brída, Vladimír Wieser

26220120050 *Title: Centrum of excellence for Systems and Services of Intelligent Transport II*

Coordinator: Dado Milan

Researchers: Vaculík Martin, Roman Jarina, Róbert Hudec, Peter Brída, Vladimír Wieser, Miroslav Benčo

26220220153 *Title: Competence Centre for Research and Development in Diagnosis and Therapy of Carcinoma*

Coordinator: Róbert Hudec

Researchers: Brežňan Martin, Miroslav Benčo

22420320001 *Title: Interregional Mobile Television DVB-H*

Researchers: Vaculík Martin, Milan Trunkvalter, Miroslav Uhrina, Ján Hlúbik

26110230005 *Title: Flexible and Attractive Study at University of Zilina for Needs of Labour Market and Knowledge Society*

Researchers: Vaculík Martin, Hudec Róbert, Jarina Roman, Milan Trunkvalter, Hlúbik Ján, Kortiš Peter, Dolnák Ivan

26110230004 *Title: Title: Transfer Systematization of Progressive Technologies and Knowledge between Industry and Universities*

Researchers: Brída Peter, Roman Jarina, Darina Jarinová, Počta Peter, Schwartz Ladislav

26220220022 *Title: Design of New Diagnostic Algorithm for Selected Tumour Affections*

Researchers: Hudec Róbert, Roman Jarina, Michal Kuba

26220220021 *Title: Centre of Translation Medicine*

Researchers: Hudec Róbert

26220220134 *Title: Research of Technologies and Products for Intelligent and Technical Fabrics*

Coordinator: Hudec Róbert

Researchers: Vladimír Wieser, Martin Vaculík, Miroslav Benčo, Martin Vestenický

26220220415 *Title: Broker Centre of Aviation Technology Transfer and Expertise in Transport and Transport infrastructure*

Researchers: Dado Milan, Vladimír Wieser, Brída Peter, Miroslav Benčo, Dubovan Jozef

26250120021 *Title: Modernisation of Infrastructure University of Žilina, focusing on ICT*

Coordinator: Milan Malcho

Researchers: Milan Trunkvalter

26250120046 *Title: Infrastructure Support to improve the conditions of the educational process*

Coordinator: Milan Malcho

Researchers: Milan Trunkvalter

#### 4.1.4 Other national grants

*SEOP-17-13/2011-OdPP, support of the Ministry of Defence of SR for the project: Helicopter fuselage Crack monitoring and prognosis through on-board sensor network (HECTOR)*

Coordinator: Hudec Róbert

Researchers: Wieser Vladimír, Hottmar Vladimír, Benčo Miroslav, Kuba Michal, Vestenický Martin, Dubovan Jozef, Zachariášová Martina, Pollák Štefan, Martin Hric

## 4.2 International Projects

### 4.2.1 Other international projects

*A-0930-RT-GC Title: Helicopter fuselage Crack monitoring and prognosis through on-board sensor network (HECTOR)*

Coordinator at UoŽ: Hudec Róbert

Researchers: Wieser Vladimír, Hottmar Vladimír, Benčo Miroslav, Kuba Michal, Vestenický Martin, Dubovan Jozef, Zachariášová Martina, Pollák Štefan, Martin Hric

*ETSI STF 436 on Adaptation of the ETSI QoS Model to better consider results from field testing*

Researcher: Počta Peter

*COST IC 1003 European Network on Quality of Experience in Multimedia Systems and Services (QUALINET)*

National representatives: Roman Jarina, Peter Počta

## 5 Cooperation

### 5.1 Partners of Science and Technology Cooperation in Slovakia

General Milan Rastislav Štefánik Armed Forces Academy in Liptovský Mikuláš  
Slovak University of Technology (STU), Bratislava  
Technical University of Košice (TU)  
Pavol Jozef Šafárik University in Košice  
Constantine the Philosopher University in Nitra  
Matej Bel University, Banská Bystrica  
Technical University in Zvolen (TU)  
Alcatel Lucent  
Association of Telecommunication Operators (ATO), Bratislava  
CISCO Academy, Košice  
CISCO Slovakia  
Gity Slovensko, Inc., Martin  
IBM Slovensko, Ltd. Banská Bystrica  
Cluster Z@ICT, Žilina  
Nokia Siemens Networks, Bratislava  
Orange, Inc. Bratislava  
PC Consulting, Bratislava  
Slovak Electrical Society Section with the Department of Telecommunications  
University of Žilina  
RRC-CZ, Ltd. Prague  
SEPS, Inc., Bratislava  
Slovak Society for System Integration, Banská Bystrica



Slovak Organization for Space Activities, Bratislava  
Slovak Telekom, Inc., Bratislava  
Siemens Program and System Engineering s.r.o. (PSE) Slovensko - Bratislava, Žilina  
Siemens Ltd., Bratislava  
Slovak Electrotechnical Society, Banská Bystrica  
Central Slovak Energetic (SSE), Žilina  
Telemont Slovakia, Bratislava  
Catholic University in Ružomberok  
TES Slovakia, Inc., Žilina  
Research Institute of Posts and Telecommunications (VÚS) Banská Bystrica  
Transport Research Institute, Inc., Žilina  
WRX Slovakia Limited, Malinovo  
Institute of Informatics, Slovak Academy of Sciences, Bratislava  
ZTV Television Zilina

## 5.2 R&D cooperation partners abroad

Queen Mary, University of London, UK  
Telecom ParisTech, France  
Czech Technical University Prague, ČVUT, CZ  
VŠB -TU Ostrava, CZ  
Universidad Politecnica Valencia, Spain  
ENIC Lille, France  
SIU Győr, Hungaria  
KTP Sofia, Bulgaria  
SUT St. Peterburg, Russia  
SibSUTI Novosibirsk, Russia  
European Telecommunications Standards Institute, Sophia-Antipolis, France  
MESAQIN.com, Prague, CZ  
Athens Information Technology (AIT), an internationally-renowned education and research center in the fields of information technology and telecommunications  
EACEA - Education, Audiovisual and Culture Executive Agency  
Alcatel Lucent, Stuttgart  
University of Patras, Greece  
University of Applied Sciences FH, Leipzig  
Todor Kableshkov Higher School of Transport, Sofia, Bulgaria  
College of Post and Telecommunications, Sofia, Bulgaria  
Telenor, Norway  
University of Graz, Austria  
TU Dresden, Germany  
Telekom Austria, Austria  
Deutsche Telekom, Germany  
Swisscom, Switzerland  
National University of Ireland, Galway, Ireland  
Politecnico di Milano (POLIMI), Italy  
AGUSTAWESTLAND, Italy  
Vitrociset S.p.A., Italy  
Consorzio Milano Ricerche, Italy  
Stiftelsen SINTEF, Norway  
AGH University of Science and Technology, Poland

**5.3 ERASMUS /Socrates partners:**

Helsinki University of Technology  
 University of Catania  
 TU Dresden  
 University of East London  
 Hellenic Open University, Patras, Greek  
 Ankara University, Turkey  
 Tampere University of Technology, Finland  
 University of Porto, Portugal

**5.4 Visitors to the Department**

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Oleg Chernojarov	Moscow Power Engineering Institute	3 months
Hugh Melvin	Department of Radio engineering Devices National University of Ireland, Galway, Ireland	9 days
Gokhan Ilk	Ankara University, Ankara, Turkey	2 days
Padraig O Flaithearta	National University of Ireland, Galway, Ireland	3 days
Michael Schukat	National University of Ireland, Galway, Ireland	3 days
Andrew Lawless	National University of Ireland, Galway, Ireland	3 days
Bhaskar Rudroju	National University of Ireland, Galway, Ireland	3 days
Johnny Shannon	National University of Ireland, Galway, Ireland	3 days
Klemens Adler	Vodafone D2 GmbH, Germany	7 days
Robert Benz	Deutsche Telekom AG, Germany	5 days
Martin Brand	Telekom Austria AG, Austria	7 days
Jean-Francis Dolidet	Telecom, France	7 days
Johan Foldoy	Norwegian Post and Telecommunications Authority	7 days
Christoph Furer	SWISSCOM SA, Switzerland	7 days
Hans Wilhelm Gierlich	Head acoustics GmbH, Germany	5 days
Jan Holub	Mesaqin.com s.r.o (Ltd.), Czech Republic	3 days
Andreas Kamcke	Gigaset Communications GmbH, Germany	6 days
Jean-Yves Le Saout	Telecom, France	5 days
Jean-Yves Monfort	JYM C.I.S., France	5 days
Joachim Pomy	PQM Consultants, Germany	10 days
Catherine Quinquis	France Telecom, France	5 days
Dong Hi Sim	European Telecommunications Standards Institute	7 days
Allen K. Woo	PLANTRONICS LTD, USA	6 days

#### 5.4 Visits to foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Miroslav Benčo	Politecnico di Milano (POLIMI), Italy	12 days
	European Defence Agency (EDA), Belgium	3 days
	Proposers' Networking Day FP7-ICT Call 8 & Celtic-Plus Call 2, Warsaw, Poland	2 days
	ICT Proposers' Day, Budapest, Hungary	2 days
	University of Patras, GreeceHellenic Open University, Greece	5 days
Peter Brída	Yeungnam University, Daegu, South Korea	3 days
	Ankara University, Turkey	5 days
	ČVUT Prague, Doksy, Czech Republic	3 days
	VUT Brno, Budapest, Hungary	5 days
	IEEE GCC, Dubai, United Arab Emirates	4 days
Milan Dado	VŠB TU FEI Ostrava, Czech Republic	1 day
	AIT Austria Institute of Technology Vienna	1 day
	ČVUT Prague, Czech Republic	1 day
	MTUCI Moscow, Russia	3 days
	Hochschule fur Telekommunikation HfTL Leipzig	3 days
	Stále zastupitel'stvo SR Brussel, Belgium	2 days
	Brussel, COST Belgium	2 days
	MŠMaT Prague, Czech Republic	1 day
	Politecnico di Milano (POLIMI), Italy	8 days
	European Defence Agency (EDA), Belgium	3 days
Róbert Hudec	ICT Proposers' Day, Budapest, Hungary	2 days
	CVUT Prague, Czech Republic	4 days
Peter Počta	TU Dresden, Germany	5 days
	Ankara University, Turkey	5 days
	University College Dublin, Ireland	2 days
	National University of Ireland, Galway, Ireland	3 days
	Vrije Universiteit Brussel, Belgium	4 days
	Mesaqin.com, Prague, Czech Republic	8 days
	International Telecommunication Union, Geneva, Switzerland	5 days
	Swisscom, Bern,	5 days
	Telekom Austria Vienna, Austria	5 days
	Vysoká škola báňská - TU Ostrava	2 days
Martin Vaculík	Hochschule fur Telekommunikation HfTL Leipzig	3 days
	Byelorussia State University, Minsk, BLR	3 days
Milana Trunkvalter	Byelorussia State University, Minsk, BLR	3 days
Martina Zachariášová	Politecnico di Milano (POLIMI), Italy	12 days

#### 5.5 Contracts (Business Activities)

*P-103-0005/09 Title: Addressing the detection of contact of any body part or equipment with the goal competitor - bar*

Customer: Canoe Slalom, s.r.o. Bratislava

Coordinator: Martin Vaculík

Researchers: Martin Vestenický, Michal Kuba

## 6 Other activities

### 6.1 Conferences, Workshops, Symposiums Organized by the Department

- DIGITAL TECHNOLOGIES 2011 (DT'11), 11. – 12. 11. 2011, University of Žilina, Administrators: Branch of Slovak Electrotechnical Society (DTaM, UoŽ) and Faculty of Informatics and Management, UoŽ
- Special Session on User Adaptive Systems for mobile Wireless Systems at ACIIDS 2011, The 3rd Asian Conference on Intelligent Information and Database Systems, April 20-22, 2011 Daegu, Korea. Lecture Notes in Artificial Intelligence, LNCS Vol. 6592/2011. (Eds.). Springer-Verlag, Berlin, Heidelberg. ISSN 0302-9743, ISBN 978-3-642-20042-7, Vice-chairman: Peter Brída
- Hudec, R. a kol.: Seminar " Research as a stimulus of education in secondary schools ", within POPULAS project, Žilina, 9.12.2011

### 6.2 Lectures and courses organized by the Department

Dolnák, I., Kortiš, P.:	Cisco CCNA Exploration 1 – 4, DTaM Žilina
Hudec, R. et all.:	POPULAS, Secondary School Kysucké Nové Mesto
Hudec, R. et all.:	POPULAS, Technical Secondary School, Dubnica nad Vahom,
Hudec, R. et all.:	POPULAS, Grammar-School, Bytča
Hudec, R. et all.:	POPULAS, Technical Secondary school of Jozef Murgaš Banská Bystrica
Hudec, R. et all.:	POPULAS, Grammar-School, Turzovka
Hudec, R. et all.:	POPULAS, Technical Secondary School of Transport, Trnava
Hudec, R. et all.:	POPULAS, Joint Secondary School, Tvrdošín
Hudec, R. et all.:	POPULAS, Joint Electrotechnical Secondary School, Liptovský Hrádok
Wieser, V.	Data Transmission in Mobile Radio Networks, T-Com Slovakia

### 6.3 Invited Lectures

Počta, P.:	Quality of voice and video transmission over IP networks (as one of the crucial aspects of current Telecommunications) - University College Dublin a National University of Ireland Galway
Počta, P.:	Quality of voice and video transmission over IP networks (as one of the crucial aspects of current Telecommunications) – Ankara University, Turkey
Počta, P.:	Quality of voice and video transmission over IP networks (as one of the crucial aspects of current Telecommunications) – TU Dresden, Germany
Počta, P.:	Derivation of Speech Activity Parameter Values in the Context of Speech Quality Testing, ETSI STQ#38 Vienna, Austria
Počta, P.:	Derivation of Speech Activity Parameter Values in the Context of Speech Quality Testing, ITU-T SG12, Geneva
Brída, P.:	Introduction to Mobile Positioning in a Heterogeneous Wireless Networks, Ankara University, Turkey
Brída, P.:	Concrete Solutions for Positioning in Cellular and Ad hoc Networks, Ankara University, Turkey

#### 6.4 Membership in International Organizations and Societies

Peter Brída	<ul style="list-style-type: none"> <li>- ICST member (Institute for Computer Sciences, Social Informatics and Telecommunications Engineering), Gent, Belgium</li> <li>- Scientific Committee member of the Conf. on Knowledge in Telecommunication and Optics, Szczyrk, Poland</li> </ul>
Milan Dado	<ul style="list-style-type: none"> <li>- Member of IEEE, USA</li> <li>- Member of SPIE, USA</li> <li>- National coordinator of COST and member of CSO COST</li> <li>- Chair of International sec. of the editorial Board – Journal Advances in Electrical and Electronic Engineering, Ostrava</li> </ul>
Ivan Dolnák	<ul style="list-style-type: none"> <li>- Member of IEEE, USA</li> </ul>
Roman Jarina	<ul style="list-style-type: none"> <li>- National representative and MC member of COST IC 1003</li> <li>- Member of IEEE, USA</li> <li>- Member of IET, UK</li> <li>- Member of AES, USA</li> </ul>
Daša Tichá	<ul style="list-style-type: none"> <li>- Member of IEEE, USA</li> <li>- Member of Radioengineering, Prague</li> </ul>
Peter Počta	<ul style="list-style-type: none"> <li>- Member of Speech Transmission Quality working group (ETSI), Sophia–Antipolis</li> <li>- Member of Management Committee of ETSI STF 392</li> <li>- Member of Study Group 12 at ITU-T, Geneva</li> <li>- Member of Scientific Committee of Int. conf. on Knowledge in Telecommunication and Optics, Ostrava</li> <li>- Member of Scientific Committee of Int. conf MESAQIN</li> <li>- National representative and MC member of COST IC 1003</li> </ul>
Darina Jarinová	<ul style="list-style-type: none"> <li>- Member of IEEE, USA</li> </ul>
Martin Vaculík	<ul style="list-style-type: none"> <li>- Member of Scientific Committee of Int. conf RTT 2011</li> <li>- Member of Scientific Committee of Int. conf on Knowledge in Telecommunication and Optics, Ostrava</li> <li>- Member of Scientific Committee of conf PRIZMA</li> <li>- Editorial Board member of Journal Advances in Electrical and Electronic Engineering, Ostrava</li> </ul>
Vladimír Wieser	<ul style="list-style-type: none"> <li>- Editorial Board member of Journal Radioengineering, CZ</li> </ul>

#### 6.5 Membership in National Institutions/Committees

Milan Dado	<ul style="list-style-type: none"> <li>- Member of VEGA - 5 for electrotechnics, automatization and control system and close fields of informative and communication technologies for Electrotechnic and informatics,</li> <li>- Chairman of Development Agency of the Žilina Self-governing region</li> <li>- Member of scientific board LF Martin</li> <li>- Member of scientific board FEI STU, Bratislava</li> <li>- Member of scientific board FEI TU, Košice to (from October 10, 2008 to January 31, 2011)</li> <li>- Member of scientific board CVUT Prague</li> <li>- Chairman of board of directors in Orange Foundation</li> <li>- Member of working group AK No. 16</li> <li>- Member of board of directors SAIA regional</li> <li>- Member of chairmanship of Cluster Z@ICT</li> </ul>
Ján Dúha	<ul style="list-style-type: none"> <li>- Member of committee for technical normalization “TK80 Rádiokomunikácie” at SÚTN, Bratislava</li> <li>- Terminology forum SES at VÚS Banská Bystrica</li> </ul>
Rudolf Hronec	<ul style="list-style-type: none"> <li>- Elected member of Slovak engineering science academy</li> </ul>

- Ladislav Schwartz
  - Expert in „Electrotechnic and computer technique”
  - Member of committee for technical normalization “TK41 Telekomunikácie” at SÚTN, Bratislava
  - Terminology forum at VÚS Banská Bystrica
- Dáša Tichá
  - Member of SES council
- Milan Trunkvalter
  - Council member for development and financing of the Council for Higher Education SR, University of Žilina
  - Member of the Slovak National Committee of FEANI Development Council and the Council of Higher Education funding for SR University of Žilina

## 6.6 Membership in University Boards

- Peter Brída
  - Member of organizing committee of international conference Transcom 2011
- Milan Dado
  - Chairman of OK (professional branch committee) for study Specialization no. 5.2.15 Telecommunications
  - Member of SOK (professional branch committee) for disciplinary specialization no. 26-27-9 Telecommunications
  - Chairman of EF Scientific Council
  - Member of editorial board of EDIS Žilina
  - Member of ŽU Scientific Council
  - Member of FRI Scientific Council
  - Member of SJF Scientific Council
- Róbert Hudec
  - Member of OK for study specialization no. 5.2.15 Telecommunications
  - Member of Academic Senate of EF
  - Member of organizing committee of international conference Transcom 2011
- Peter Počta
  - Member of scientific committee of Digital Technologies 2011 workshop
- Ladislav Schwartz
  - Member of scientific committee of Digital Technologies 2011
- Daša Tichá
  - Chairman of scientific committee of Digital Technologies 2011
  - Member of editorial board Slaboproudý obzor, Prague
- Milan Trunkvalter
  - Member of SOK for study specialization no. 26-27-9 Telecommunications
  - Member of EF Scientific Council
  - Chairman of Editorial Board of University of Žilina
- Martin Vaculík
  - Member of OK for study specialization no. 5.2.15 Telecommunications
  - Member of EF Scientific Council
  - Member of editorial board at journal Communications – Scientific Letters
  - Member of EF Scientific Council
  - Member of Board of informatics at University of Žilina
  - Member of Academic Senate of EF
  - Chairman of Academic Senate of University of Žilina
  - Member of scientific board of conference Transcom 2011
- Vladimír Wieser
  - Member of EF Scientific Council
  - Member of scientific board of conference Transcom 2011
  - Member of OK for study specialization no.5.2.15 Telecommunications

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#### **Patents, Industrial Designs, Author's Certificates and Discoveries**

- [80] SCHWARTZ, L., HOTTMAR, V.: Involvement of end-user boxes of interactive TV cable distribution. P 287679 (AGJ)

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#### **Other publications (additional publications – non-reviewed articles, standards, dissertations, published studies, surveys, etc.).**

- [82] LUKÁČ P.: The modified algorithm of automatic color image segmentation based on graph theory, dissertation, supervisor: Róbert Hudec, Žilinská univerzita v Žiline, EF, DTaM; December 2011

## **8 Contact Address**

Department of Telecommunications and Multimedia  
Faculty of Electrical Engineering  
University of Žilina  
Univerzitná 1, 010 26 Žilina  
Slovak Republic  
Phone: ++421-41-513 2200  
Fax: ++421-41-513 1520  
E-mail: [kt@fel.uniza.sk](mailto:kt@fel.uniza.sk)  
www: <http://kt.uniza.sk/kt/>

Katedra telekomunikácií a multimédií  
Elektrotechnická fakulta  
Žilinská univerzita  
Univerzitná 1, 010 26 Žilina  
Slovenská republika

## DEPARTMENT OF ENGINEERING FUNDAMENTALS

### 1 General Information

The Department is housed at the Satellite Workplace of the Faculty in Liptovský Mikuláš which has been experiencing the 10th academic year since the establishment in 2002. The main educational task of the department is teaching the majority of general, but also some specialized courses of the bachelor's degree of the undergraduate programme in Telecommunications and Digital Technologies at the Satellite Workplace. Educators have been continually preparing to teach new courses in the new study program of Digital Technologies. With the aim to improve access of students to course materials and study guides for interactive and self-study, contents of some courses have been permanently under preparation. The staff works closely together with the Department of Experimental Electrical Engineering that is also located at the Satellite Workplace in Liptovský Mikuláš.

Academic and scientific commitments of the Department are highly diverse. The focus area in mathematics is the real functions theory. In physics, the effort is aimed at physical properties of thin films and surfaces, mainly at diagnostics of semiconductor and dielectric thin films systems and multilayer structures. Optical properties are studied by spectroscopies. Physical and morphological properties of multilayer structure surfaces and interfaces are investigated by several types of scanning probe microscopy (SPM), e.g. scanning tunnelling microscopy and atomic force microscopy (AFM). The data are processed e.g. by an original and advanced statistical and fractal method. One member of the Department specialized in the control theory is oriented on research in alternative and renewable energy resources. In cooperation with the Department of Telecommunications and Multimedia, design and simulation of transmission characteristics of wavelength-sensitive and nonlinear optical elements for high-speed optical communication systems and access networks as well as the investigation of degradation effects on optical signals propagating in these systems have been under study.

Scientific activities of the Department are based on long-term cooperation with institutes of the Slovak Academy of Sciences and several Slovak and foreign universities. The Department has been traditionally invited to the organizing and program committees of international scientific conferences. In 2011 the Laboratory for Simulation and Modelling was built at the Department with the financial support of the EU structural funds. High-performance computing aimed mainly at simulations of complex quantum systems used in optoelectronics, microelectronics and photovoltaics is facilitated in the Laboratory.

### 2 Staff of the Department

Head of the Department:	Jarmila Müllerová
Administrative Support:	Eva Púčeková
Technical Support:	Ľubomír Bako
Associate Professors:	Jarmila Müllerová, Zdislav Exnar
Senior Lecturers (with PhD):	Stanislav Jurečka, Robert Menkyna
Senior Lecturers (without PhD):	Ľubomír Mydielka
External Lecturers:	Danica Susedíková, Mária Tvrdoňová

#### 2.1 Postgraduate Students

Internal (full-time):	Eliška Jurisová, Libor Ladányi (since 1 September, 2011)
External (part-time):	Dušan Korček

### 3 Teaching

#### 3.1 Courses in Bachelor and Master Degree Programmes

##### 3.1.1 Bachelor Degree Programmes

Code	Title	Lessons-Seminars-Exercises		
		Semester	hours/week	Teachers
<i>Courses at the Faculty of Electrical Engineering</i>				
31102	Linear Algebra	1	2 – 2 – 0	Mydielka
31104	Mathematical Analysis	1	2 – 2 – 0	Mydielka
31110	Introduction to Physics	1	1 – 2 – 0	Jurečka
31200	Foreign Language	2	0 – 2 – 0	Tvrdoňová, Susedíková
31201	Physics 1	2	3 – 2 – 1	Jurečka
31203	Mathematical Analysis 2	2	4 – 3 – 0	Menkyna
31208	Selected Topics in Mathematics	2	2 – 2 – 0	Menkyna
31303	Physics 2	3	3 – 2 – 1	Müllerová
31305	Mathematics	3	3 – 3 – 0	Menkyna
31307	Computer Modelling of Real Processes	3	1 – 0 – 2	Jurečka
31433	Transmission Media	4	3 – 1 – 0	Müllerová
31442	Theoretical Electrical Engineering 3	4	3 – 2 – 0	Jurečka
31419	Java – Language and Application Development	4	2 – 0 – 2	Exnar
31503	Bachelor Project 1	5	0 – 0 – 2	Exnar
31515	Electroacoustics	5	3 – 1 – 1	Jurečka
31546	Design of Multimedia Web Pages	5	2 – 0 – 2	Exnar, Ladányi
31524	Logical Circuits	5	3 – 1 – 1	Exnar
31605	Database Systems	6	4 – 0 – 2	Exnar
31603	Bachelor Project 2	6	0 – 0 – 2	Müllerová
31600	Bachelor Thesis	6	0 – 2 – 0	Müllerová, Exnar, Jurečka, Menkyna, Jurisová

### 4 Educational, Research and Scientific Projects

#### 4.1 National Projects

##### 4.1.1 Research Projects Funded by the Scientific Grant Agency of the Slovak Republic (VEGA)

*Title: Physical properties of the passivated a-Si:H based structures (VEGA 2/0070/10)*

Coordinator: Emil Pinčík (Institute of Physics, Slovak Academy of Sciences)

Sub-Coordinator: Jarmila Müllerová

Co-operator: Stanislav Jurečka

*Title: A study of alternative solutions for mitigation of impairments due to polarization mode dispersion in high-speed optical networks (VEGA 2/0411/10)*

Coordinator: Jarmila Müllerová

Co-operators: Stanislav Jurečka, Robert Menkyna, Eliška Jurisová

#### 4.1.2 Research Projects Funded by the Slovak Research and Development Agency (APVV)

*Title: Research and optimization of parameters of c-Si and poly-Si MIS solar cells (APVV-0577-07)*

Coordinator: Emil Pinčík (Institute of Physics, Slovak Academy of Sciences)

Coordinator for UoŽ: Jarmila Müllerová

Co-operator: Stanislav Jurečka

#### 4.1.3 Projects of European Structural Funds

*Title: Centre of Excellence of Power Electronics Systems and Materials for their Components (OPVaV-2008/2.1/01-SORO ITMS 26220120003)*

Co-operators (Activity 4.1): Jarmila Müllerová, Zdislav Exnar, Stanislav Jurečka

*Title: Centre of Excellence of Power Electronics Systems and Materials for their Components II. (OPVaV-2008/2.2/01-SORO ITMS 26220120046)*

Co-operators (Activity 2.1): Jarmila Müllerová, Zdislav Exnar, Stanislav Jurečka

*Title: Flexible and attractive studies at the University of Žilina for the needs of the labour market and the knowledge-based society (OPV-2009/1.2/01-SORO ITMS 26110230005)*

Co-operators (Activity 2.4): Jarmila Müllerová, Zdislav Exnar, Stanislav Jurečka

*Title: The support of the infrastructure of the University of Žilina for the teaching and learning improvement (OPVaV-2009/5.1/03-SORO ITMS 26250120046)*

Assistant of the co-ordinator (Activity 1.1): Jarmila Müllerová

## 4.2 International Projects

### 4.2.1 COST Projects

*Title: Towards Functional Sub-Wavelength Photonic Structures (COST Action MP0702)*

Co-operators: Jarmila Müllerová, Eliška Jurisová

### 4.2.2 Other International Projects

*Title: Materials and Components for Environmental Protection (Project No. 1M06031 of the Ministry of Education, Youth and Sports, the Czech Republic)*

Coordinator: Pavel Šutta (University of West Bohemia, Plzeň, the Czech Republic)

Co-operators: Jarmila Müllerová

## 5 Co-operation

### 5.1 Co-operation Partners in Slovakia

- Institute of Physics, Slovak Academy of Science, Bratislava
- Academy of the Armed Forces of General Milan Rastislav Štefánik, Liptovský Mikuláš
- Institute of Polymer Materials, Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava
- Institute of Electronics and Photonics, Institute of Nuclear and Physical Engineering, Faculty of Electrical Engineering and Informatics, Slovak University of Technology in Bratislava
- Department of Experimental Physics, Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava
- Institute of Inorganic Chemistry, Slovak Academy of Sciences, Bratislava
- Faculty of Medicine, Comenius University, Bratislava
- Alcatel – Lucent Slovakia, A.S.



## 5.2 International Co-operation Partners

- Institute of Scientific and Industrial Research, Osaka University, Japan
- New Technologies - Research Center, University of West Bohemia, Plzeň, the Czech Republic
- Institute of System Engineering and Informatics, Faculty of Economics and Administration, University of Pardubice, the Czech Republic
- Department of System Analysis, Faculty of Informatics and Statistics, University of Economics in Prague, the Czech Republic
- HZB Helmholtz Zentrum Berlin, Institute for Silicon Photovoltaics, Berlin, Germany
- Institute of Microelectronics and Technology, Kandó Kálmán Faculty of Electrical Engineering, Óbuda University, Budapest, Hungary
- Budapest University of Technology and Economics, Budapest, Hungary

## 5.3 Visitors to the Department

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Jiří Krupka	University Pardubice, the Czech Republic	2 days
Pavel Cheben	National Research Center, Ottawa, Canada	2 days
Pavel Šutta	University of West Bohemia, Plzeň, the Czech Republic	3 days
Dušan Novotný	Měřicí technika – Moravia Brno, the Czech Republic	1 day
Bohumil Kvapil	TESTE Testovací technika Representative of Keithley, Pardubice, the Czech Republic	2 days
Yoshihiro Morimoto	Keyence International Belgium	1 day

## 5.4 Visits to Foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Zdislav Exnar	Economics University in Prague Faculty of Informatics and Statistics, Prague, the Czech Republic	2 days
Jarmila Müllerová	the Royal Institute of Technology Stockholm, Sweden	4 days

## 6 Other Activities

### 6.1 Conferences, Workshops, Symposiums Organized by the Department

- 17th International Scientific Conference Applied Physics of Condensed Matter APCOM 2011, 22 – 24 June, 2011, Nový Smokovec, Slovakia. Organizers: Department of Physics and Department of Engineering Fundamentals, Faculty of Electrical Engineering, University of Žilina; Department of Microelectronics and Department of Nuclear Physics and Technology, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology Bratislava; Slovak Physical Society
- Excursion for the 2nd class Bc Degree students at the Alcatel-Lucent Slovakia centre in Liptovský Hrádok, 28 April 2011 (Jarmila Müllerová)
- Doors Open Day, the Satellite Workplace of the Faculty of Electrical Engineering in Liptovský Mikuláš, 21 January 2011 (Zdislav Exnar, Stanislav Jurečka)

## 6.2 Specialised Lectures, Courses Organized by the Department

*Title of Lecture: Holography – Principles and Applications*

Customer: students and staff of the Satellite Workplace

Lecturer: Dagmar Senderáková, Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava

Date: 24 November 2011

*Title of Lecture: Study of the Change of Optical Properties of Amorphous Silicon Caused by the Change of Structure*

Customer: Research Centre – New Technologies, University of West Bohemia, Plzeň

Lecturer: Lucie Prušáková, University of West Bohemia, Plzeň, Jarmila Müllerová – co-author of the lecture

Date: 24 January 2011

## 6.3 Invited Lectures/Papers

*Title of Lecture: Super-separation Thin Film Filtering for Coexistence-type Colorless WDM-PON Networks*

Lecturer: Jarmila Müllerová

Where/Date: 13th International Conference on Transparent Optical Networks ICTON 2011, Stockholm, Sweden/27 – 30 June 2011

## 6.4 Membership in International Institutions/Committees

Jarmila Müllerová - Member of the programme committee of the International Conference Information Photonics 2011, 18 – 20 May 2011, Ottawa, Canada

Stanislav Jurečka - Member of American Nano Society

## 6.5 Membership in National Institutions/Committees

Jarmila Müllerová - Branch Committee for PhD. Study in study branch No. 4.1.4 Quantum Electronics and Optics, Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava

- Committee on Education of the Town Council, Liptovský Mikuláš

- Member of the Programme Committee of the international conference Applied Physics of Condensed Matter APCOM 2011

## 6.6 Membership in University Boards

Jarmila Müllerová - Branch Committee for PhD. Study in study branch No. 5.2.15 Telecommunications

- Branch Committee for PhD. Study in study branch No. 5.2.12 Electrotechnologies and Materials

- Scientific Board of the Faculty of Electrical Engineering

- Academic Senate of the Faculty of Electrical Engineering

## 6.7 Awards

Dušan KORČEK: Award for the excellent presentation of the contribution *Wavelength allocation for future coexistence XGPON*. 13th Conference of Doctoral Students ELITECH 2011, 17 May 2011, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava. Session No. 7 - Telecommunication

## 7 Publications

### Chapters in Foreign Monographs

- [1] JUREČKA, Stanislav: *Theoretical Model of the Physical System: Optimization by the Genetic Algorithm*. In: Stochastic Optimization - Seeing the Optimal for the Uncertain. I. Dritsas, Editor. InTech Publisher, ISBN 978-953-307-829-8, Vienna 2011 (in English)

### Current Content Journals

- [2] JUREČKA, Stanislav – KOBAYASHI, Hikaru – KIM, Woo-Byoung – TAKAHASHI, Masao – PINČÍK, Emil: *Study of density of interface states in MOS structure with ultrathin NAOS oxide*, In: Centr. Eur. J. Phys., Vol. 10, 2012, ISSN 1895-1082, No. 1, p. 210 – 217 (in English)
- [3] MÜLLEROVÁ, Jarmila – FISCHER, Marinus – NETRVALOVÁ, Marie – ZEMAN, Miro – ŠUTTA, Pavel: *Influence of deposition temperature on amorphous structure of PECVD deposited a-Si:H thin films*. In: Centr. Eur. J. Phys., Vol.9, 2011, ISSN 1895-1082, No.5., p. 1301 – 1308 (in English)

### Patents

- [4] EXNAR, Zdislav – LAKOTA, Bohuslav: *Predictive Digital Position Sensor*. Granted by the Industrial Property Office of the Slovak Republic, 2011, No. P 287617

### Other Reviewed Foreign Journals

- [5] NETRVALOVÁ, Marie – PRUŠÁKOVÁ, Lucie – MÜLLEROVÁ, Jarmila – ŠUTTA, Pavel: *Optical properties of amorphous hydrogenated and microcrystalline silicon films prepared by plasma enhanced chemical vapor deposition and re-crystallized at moderate temperatures*. Phys. Stat. Solidi C, Vol.8, 2011, ISSN 1610-1642, No.9, p. 2680 – 2683 (in English)

### Other Reviewed Slovak Journals indexed by Scopus

- [6] JURISOVÁ, Eliška – MÜLLEROVÁ, Jarmila: *Numerical Studies of Optical Bistability of Absorptive Type*. In: Komunikácie (Communications), No. 2A, 2011, ISSN 1335-4205, p. 61 – 66 (in English)

### Papers in Proceedings of the Conference Published in Prestigious Foreign Publisher

- [7] MÜLLEROVÁ, Jarmila – KORČEK, Dušan: *Super-separation thin film filtering for coexistence-type colorless WDM-PON networks* (Invited Paper). In: IEEE Conference Proc. 13th International Conference on Transparent Optical Networks ICTON 2011, Stockholm, Sweden, 27. – 30. 6. 2011, Tu.C6.4, 2011, IEEE, ISBN 978-1-4577-0882-4 (in English)
- [8] JURISOVÁ, Eliška – MÜLLEROVÁ, Jarmila – KOŠČOVÁ, Marcela: *Investigation of nonlinear chalcogenide fiber Bragg gratings as a promising tool for all-optical switching*. Proc. of SPIE Vol. 8306, Photonics, Devices and Systems V. ISBN 0277-786X, Article No. 830614 (in English)
- [9] JUREČKA, Stanislav – MÜLLEROVÁ, Jarmila – DADO, Milan: *The cavity resonator design: stochastic optimization of the transmission line method*. Proc. of SPIE Vol. 8306, Photonics, Devices and Systems V. ISBN 0277-786X, Article No. 83060P (in English)

### Reviewed Conference Proceedings Abroad (including 2010 supplement)

- [10] EXNAR, Zdislav – KOŠČOVÁ, Marcela – EXNÁROVÁ, Anna: *Models and Simulations. Systémové přístupy '11, Systémové myšlení jako změna paradigmatu (System Thinking as a Paradigm Change)*. Praha, the Czech Republic, 8.12.2011. Oeconomica Publisher, 2011. ISBN 978-80-245-1844-2 (in Slovak)
- [11] PRUŠÁKOVÁ, Lucie – VAVRUŇKOVÁ, Veronika – NETRVALOVÁ, Marie – MÜLLEROVÁ, Jarmila – ŠUTTA, Pavel: *Change of optical properties of a-Si:H films in dependence on different material structure*. Proc. 5th Czech Photovoltaic Conference, 10 – 13 November 2010, Brno, the Czech Republic, Czech RE Agency, p. 30 – 35, ISBN 97880-254-8906-2 (in English)

**Reviewed Conference Proceedings in Slovakia**

- [12] EXNAR, Zdislav – KOŠČOVÁ, Marcela: *Adaptive Control of an Island System*. In: Alternatívne zdroje energie (Alternative Energy Resources) *ALER 2010*, 7th Scientific Conference with International Participation, 6 – 7 October 2011, Liptovský Ján, Slovakia ISBN 978-80-554-0427-1. p. 181 – 187 (in Slovak)
- [13] EXNAR, Zdislav – LAKOTA, Bohuslav: *System of the capacity measurements of Accumulator Batteries using Datalogger*. In: Alternatívne zdroje energie (Alternative Energy Resources) *ALER 2010*, 7th Scientific Conference with International Participation, 6 – 7 October 2011, Liptovský Ján, Slovakia ISBN 978-80-554-0427-1. p. 203 – 208 (in Slovak)
- [14] JUREČKA, Stanislav – KOBAYASHI, Hikaru – MATSUMOTO, Taketoshi – TAKAHASHI, Masao – PINČÍK, Emil: *Physics of a Solar Cell*. In: Alternatívne zdroje energie (Alternative Energy Resources) *ALER 2010*, 7th Scientific Conference with International Participation, 6 – 7 October 2011, Liptovský Ján, Slovakia ISBN 978-80-554-0427-1. p. 9 – 17 (in Slovak)

**Lecture Notes**

- [15] EXNAR, Zdislav – KOŠČOVÁ, Marcela: *Diskrétné systémy riadenia* (Discrete Control Systems). EDIS Žilina, University of Žilina, 2011. ISBN: 978-80-554-0469-1. 122 pages (in Slovak)

**Other Publications**

- [16] JUREČKA, Stanislav – KOBAYASHI, Hikaru – KIM, Woo-Byoung – PINČÍK, Emil: *Properties of charge states in MOS structure with ultrathin oxide layer*. In: VII International Workshop on Semiconductor Surface Passivation SSP, Kraków, Poland, 11. – 15. 9. 2011. Book of Abstracts, p. 29 (in English)
- [17] KORČEK, Dušan – MÜLLEROVÁ, Jarmila: *Wavelength allocation for future coexistence XGPON*. In: Proc. 13th Conference of Doctoral Students ELITECH 2011. 17 May 2011 Bratislava, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava, Slovakia. Session 7 Telecommunications, Paper No.7. 6 pages (in English)
- [18] JURISOVÁ, Eliška – MÜLLEROVÁ, Jarmila: *On thermal sensitivity of uniform and apodized fiber Bragg gratings*. In: Proc. 13th Conference of Doctoral Students ELITECH 2011. 17 May 2011 Bratislava, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava, Slovakia. Session 7 Telecommunications, Paper No. 2. 5 pages (in English)

**SCI Citations**

- [19] Kundracik, F., Hartmanová, M., Müllerová, J., Jergel, M., Kostič, I., Tucoulou, R.: *Ohmic resistance of thin yttria stabilized zirconia film and electrode-electrolyte contact area*, *Mat. Sci. Eng. B, Solid State Materials for Advanced Technology*, 84 (3) (2001) 167 – 175
- Diguseppe, G., Sun, L.: Electrochemical performance of a solid oxide fuel cell with an LSCF cathode under different oxygen concentrations. *Int. J. Hydrogen Energy* 36 (8), pp. 5076-5087, 2011
- [20] Müllerová J., Jurečka S., Šutta P.: *Optical characterization of polysilicon thin films for solar applications*. *Solar Energy* (2006) 667 – 674
- B. Birouk, D. Madi: Thermal oxidation effect on structural and optical properties of heavily doped phosphorus polycrystalline silicon films. *Appl. Phys. A: Materials Science & Processing*, Volume 104, Number 2, 739-748, DOI: 10.1007/s00339-011-6332-1 2011
  - Chiou, U.P., Shieh, J.M., Pan, F.M., : Photovoltaic Performance of HWCVD Deposited c-Si:H Solar Cells Using Graded Hydrogen Dilution Window-Layer. *J. Electrochem. Soc.*, 2011, Vol. 158 Issue 10, pp. H1017-H1020
  - Mohamed, S. H.; Raaif, M.; Abd El-Rahman, A. M.; Shaaban, E. R.: Properties of Rf Plasma Nitrided Silicon Thin Films at Different Rf Plasma Processing Powers. *Acta Phys. Pol. A*, Vol. 120, No.3, 552-557, 2011

- [21] Müllerová, J., Šutta, P., van Elzaker, G., Zeman, M., Mikula, M.: *Microstructure of hydrogenated silicon thin films prepared from silane diluted with hydrogen. Appl. Surf. Sci. 254 (2008) 3690 – 3695*
- E. Fathi, Y. Vygranenko, M. Vieira, A. Sazonova: Boron-doped nanocrystalline silicon thin films for solar cells. *Appl. Surf. Sci. Vol. 257, Issue 21, 15 August 2011, Pages 8901-8905*
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## 8 Contact Address

Department of Engineering Fundamentals  
Faculty of Electrical Engineering  
University of Žilina  
Satellite Workplace  
ul. kpt. J. Nálepku 1390  
031 01 Liptovský Mikuláš  
Slovak Republic  
Phone: ++421-41-5131740, ++421-41-5131483  
Fax: ++421-44-5623976  
E-mail: [mullerova@lm.uniza.sk](mailto:mullerova@lm.uniza.sk)  
www: <http://lm.uniza.sk/~kzi/>

Katedra základov inžinierstva  
Elektrotechnická fakulta  
Žilinská univerzita  
Detašované pracovisko Liptovský Mikuláš  
ul. kpt. J. Nálepku 1390  
031 01 Liptovský Mikuláš  
Slovenská republika

## DEPARTMENT OF EXPERIMENTAL ELECTRICAL ENGINEERING

### 1 General Information

The Department of Experimental Electrical Engineering has been operating in the town Liptovský Mikuláš as the Faculty of Electrical Engineering's detached workplace since its beginning in 2002. Pedagogic activities of the Department employees are executed in the domain of general electrical engineering courses of the bachelor study programme *Telecommunication*. Staff effort is currently devoted mainly to preparation of new courses listed in the new accredited study program *Digital Technologies*. This study program was accredited in 2010/2011. It was necessary not only to prepare new lectures, but also to build up new laboratories for study programme *Digital Technologies*. Pedagogical employees in co-operation with technician built a new laboratory with modern computer equipment in which teachers use new installed interactive table. Laboratory for measures, based on computer measure cards, was built as well. Students can get familiar with modern trends in the field of measure.

Teachers of the Department pay attention to individual approach to the students, using modern technologies for this purpose. They put emphasis particularly on bachelor's thesis, that have mainly an implementation character. Results of thesis are used in the process of education. In the academic year 2010/2011, the Department organized the student scientific technical competition at the detached workplace of the Faculty of Electrical Engineering of the University of Žilina, which took place on April 7, 2011. The best students advanced to the Faculty's round of competition.

Scientific and research activities of the Department of Experimental Electrical Engineering have been focused on the field of renewable sources of energy, mostly of solar ones. In the past years, staff of the department has been solving monitoring and evaluation of the properties of photovoltaic panels, using thermovision camera FLUKE. Records of photovoltaic panel, used in applications, were taken in co-operation with HAKO Solar Company employees. Software for detection of solar panel's defects was also implemented by the department. Staff of the Department further solved tasks connected with proposal of implementation of renewable sources of energy systems into practice, as well as measurement, processing and transmission of measured data. Particular attention was devoted to algorithms proposals of adaptive and fuzzy control in RAPS (Remote Area Power System) / off grid systems.

The Department participates on projects, focused on the innovation of teaching process of study courses, using computers. Results change old pedagogical approaches to new ones, using and exploiting new technologies – both interactive tables and electronic didactical sources for individual possibilities of studying.

### 2 Staff of the Department

Head of the Department	: Marcela Koščová
Administrative Support	: Eva Púčeková
Technical Support	: Milan Blaňár

#### 2.1 Department Sections

Associate Professors	: Marcela Koščová, Zdeněk Dostál
External	: Bohuslav Lakota, Štefan Špirko
Research Fellows	: Gabriel Cibira

Senior Lecturers (with PhD) : Miroslav Ďulík, Milan Gottstein, Mária Pálušová  
 Senior Lecturers (without PhD) : Jozef Letovič

#### 2.1.1 Postgraduate Students

External (part-time) : Juraj Bajzík

### 3 Teaching

#### 3.1 Courses in Bachelor and Master Degree Programmes

##### 3.1.1 Bachelor Degree Programmes

Code	Title	Lessons-Seminars-Exercises		Teachers
		Semester	hours/week	
<i>Courses at the Faculty of Electrical Engineering</i>				
31100	Algorithmization of problems	1	2-2-0	Ďulík
31103	Management and Economics in business	1	2-1-0	Pálušová
31105	Materials and Technologies in Electrical Engineering	1	2-1-1	Pálušová
31107	Basics of Electrical Engineering	1	3-0-0	Letovič
31202	Information and Communication Networks	2	1-0-2	Ďulík
31205	Theoretical Electrical Engineering 1	2	3-3-0	Dostál, Pálušová
31209	Programming Languages 1	2	2-2-0	Koščová
31302	Electronics 1	3	3-0-2	Dostál, Ďulík, Cibira
31306	Measurements and Measuring Systems	3	2-0-3	Dostál, Koščová
31311	Programming Languages 2	3	2-0-2	Koščová
31314	Theoretical Electrical Engineering 2	3	3-3-0	Dostál, Cibira
31400	Analogue Circuits Systems	4	2-1-2	Dostál, Ďulík, Cibira
31420	Communication Technologies 1	4	2-1-0	Ďulík
31440	Signals and Systems	4	3-2-0	Špirko
31522	Communication Technologies 2	5	2-0-1	Gottstein
31535	Radio Communication Systems 1	5	2-1-0	Wieser (KT)
31526	Measurements in Telecommunications	5	0-0-3	Ďulík
31503	Bachelor project	5	0-0-2	Koščová
31544	Television Technique	5	3-1-0	Lakota
31625	Radio Communication Systems 2	6	3-1-0	Wieser (KT)
31626	ICT Services	6	2-1-0	Gottstein

### 4 Educational, Research and Scientific Projects

#### 4.1 National Projects

##### 4.1.1 Research Projects Funded by the Scientific Grant Agency of the Slovak Republic (VEGA)

*Title: VEGA 1/0411/10 Study of the alternative solutions for mitigation of impairments due to polarization mode of dispersion in high-speed optical networks*

Coordinator: Jarmila Müllerová

Co-operator: Miroslav Ďulík

#### 4.1.2 Project of Governmental Program for Research and Development

*Title: 2008/2. 1/01-SORO, ITMS 26220120003 Centre of Excellence for Power Electronic Systems and Materials for their Components*

Coordinator: Pavol Špánik

Co-operators: Marcela Koščová, Zdeněk Dostál

*Title: ITMS 26220120046 Centre of Excellence for Power Electronic Systems and Materials for their Components II.*

Coordinator: Pavol Špánik

Co-operators: Marcela Koščová, Zdeněk Dostál, Miroslav Ďulík

*Title: (ITMS 26110230005) „Flexible and attractive study at the University of Žilina for labor market's and knowledge society's needs “*

Co-operators: Miroslav Ďulík, Marcela Koščová, Mária Pálušová

## 5 Co-operation

### 5.1 Co-operation Partners in Slovakia

- HAKO Solar s.r.o. Liptovský Mikuláš
- Centre of renewable energy sources, FBERG, Technical University, Košice
- Golden SUN Slovakia, s.r.o., Liptovský Mikuláš
- Institute of Inorganic Chemistry, Slovak Academy of Sciences, Bratislava
- Alcatel - Lucent Slovakia a.s., Bratislava
- Department of Electronics, Academy of Armed Forces, Liptovský Mikuláš
- Department of Informatics, Academy of Armed Forces, Liptovský Mikuláš
- SIEMENS s.r.o. Office Ružomberok
- Electrotechnical College, Liptovský Hrádok

### 5.2 International Co-operation Partners

- National Instruments Czech Republic, s.r.o.
- University of Pardubice, Faculty of Economics and Administration, Pardubice
- Faculty of Electrical Engineering and Telecommunications, VUT Brno, Czech Republic
- South Moravian Innovation Centre, Brno, Czech Republic

### 5.3 Foreign Visitors to the Department

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Raimond Grimber	Technical University, Romania	1 day
Raimond Grimber	Technical University, Romania	1 day
Dariusz Jaworowski	National Instruments Eastern Europe	1 day
Peter Brieška	National Instruments, Czech Republic	1 day
Jiří Křupka	University of Pardubice, Faculty of Economics and Administration, CZ	1 day

### 5.4 Visits to Foreign Institutions

<i>Name</i>	<i>Institution</i>	<i>Length of stay</i>
Zdeněk Dostál	VUT Brno, Czech Republic	1 day
Zdeněk Dostál	SMI Centre Brno, Czech Republic	1 day



## 6 Other Activities

### 6.1 Conferences, Workshops, Symposiums organized by the Department

International Conference ALER 2011: Alternative Energy Resources. Liptovský Ján (in co-operation with the Slovak Society for Electrical Engineering, Liptovský Mikuláš), October 6-7, 2011.

### 6.2 Specialized Lectures and Courses organized by the Department

#### *High leverage network*

Customer: Satellite workplace of the Faculty of Electrical Engineering of the University of Žilina in Liptovský Mikuláš

Lecturer: P. Pirohovič, Alcatel-Lucent Slovakia

Date: 28<sup>th</sup> April 2011

#### *GPON cards in ISAM, Bonding, vectoring, latest DSL developments*

Customer: Satellite workplace of the Faculty of Electrical Engineering of the University of Žilina in Liptovský Mikuláš

Lecturer: Peter Lizúch, Alcatel-Lucent Slovakia

Date: 28<sup>th</sup> April 2011

#### *IP portfolio of Alcatel-Lucent*

Customer: Satellite workplace of the Faculty of Electrical Engineering of the University of Žilina in Liptovský Mikuláš

Lecturer: I. Zábrazný, Alcatel-Lucent Slovakia

Date: 28<sup>th</sup> April 2011

#### *IPTV, basic principles, latest features*

Customer: Satellite workplace of the Faculty of Electrical Engineering of the University of Žilina in Liptovský Mikuláš

Lecturer: Miloslav Siman, Alcatel-Lucent Slovakia

Date: 28<sup>th</sup> April 2011

#### *Application of system ELVIS in the cooperation with LabView*

Customer: Satellite workplace of the Faculty of Electrical Engineering of the University of Žilina in Liptovský Mikuláš

Lecturer: Peter Brieška, National Instruments Czech Republic

Date: 22<sup>nd</sup> September 2011

### 6.3 Invited Lectures/Papers

*Title of Lecture: Modern for global sun radiation meter FLA613GS*

Lecturer: Zdeněk Dostál

Place/Date: Hrotovice - Praha, Czech Republic, 2011

### 6.4 Membership in International Institutions/Committees

Milan Gottstein - Member of NATO C3 Council (Command, Control, Communication)  
Zdeněk Dostál - Member of the Programme Committee of the International conference NZEE 2011, VUT Brno  
-Member of the Scientific Committee of the International conference RESpect 2011, Faculty BERG, TU Košice.

## 6.5 Membership in University Boards

Marcela Koščová	- Member of the Scientific Board of the Faculty of Electrical Engineering, University of Žilina - Member of the Academic Senate of the Faculty of Electrical Engineering, University of Žilina - Member of the Programme Committee of the International conference ALER 2011
Zdeněk Dostál	- Chairman of the Programme Committee of the International conference ALER 2011
Miroslav Ďulík	- Member of the Programme Committee of the International conference ELEKTRO - Member of the Programme Committee of the International conference ALER 2011

## 7 Publications

### Books and textbooks

- [1] DOSTÁL, Z., ĎULÍK, M.: *Electronics 1*. 1<sup>st</sup> edition Žilina: EDIS, 2011. 98 pp. ISBN 978-80-554-0468-4 (in Slovak)
- [2] EXNAR, Z., KOŠČOVÁ, M.: *Discreet systems*. 1<sup>st</sup> edition Žilina: EDIS, 2011. 122 pp. ISBN 978-80-554-0469-1 (in Slovak)

### Other Reviewed Slovak Journals

- [3] DOSTÁL, Z., ĎULÍK, M., KOŠČOVÁ, M., ŠIMON, P.: *Monitoring of degradation of photovoltaic panels using infrared method*. In: Acta Montanica Slovaca, Vol. 15, 2010, ISSN 1335-1788, No. 2, p. 111-115, (in Slovak)

### Reviewed Conference Proceedings Abroad

- [4] JURISOVÁ, E., MÜLLEROVÁ, J., KOŠČOVÁ, M. *Investigation of nonlinear chalcogenide fiber Bragg gratings as a promising tool for all-optical switching*. In: Photonics, devices, and systems V, 24-26 August 2011, Prague, Czech Republic. Proceedings of SPIE, ISSN 0277-786X. - [Washington]: SPIE, 2011. - S. 830614-1-830614-7 (English)
- [5] EXNAR, Z., KOŠČOVÁ, M., EXNAROVÁ, A.: *Models and simulation*. Systemic Approaches. Praha, Oeconomica, 2011, ISBN 978-80-245-1728-5 (in Slovak)

### Reviewed Conference Proceedings in Slovakia

- [6] GOTTSTEIN, M., BABJAK, M.: *Rapidly deployable tactical communication system*. In: KIT 2011 - Communication and information Technologies, 6th international scientific conference, Tatranské Zruby - October 5th-7th, 2011: conference proceedings. - Liptovský Mikuláš: Armed Forces Academy of Ge. M. R. Štefánik, 2011. - ISBN 978-80-8040-426-0. - [6] s.
- [7] DOSTÁL, Z.: *Access to implementation the system renewable power source into practice*. In: Proceeding of International Conference ALER 2011, Liptovský Ján, 6.–7.10.2011, pp. 188-201. ISBN 978-80-554-0427-1 (in Slovak)
- [8] KOŠČOVÁ, M., EXNAR, Z.: *Adaptive control off grid systems*. In: Proceeding of International Conference ALER 2011, Liptovský Ján, 6.–7.10.2011, pp. 181-187. ISBN 978-80-554-0427-1 (in Slovak)

**Other Publications**

- [9] DOSTÁL, Z.: *Measuring device of solar radiation impact*. In: Magazine of Electrical Engineering ETM: special magazine for electrotechnicians, power engineers, designers, those interested in power engineering, businessmen and investors in electro, Vol. 21, No. 1 (2011), pp. 52-54, ISSN 1210-5422 (in Slovak)
- [10] DOSTÁL, Z., BAJZÍK, J.: *Modems for global sun radiation meter FLA613GS*. In: Proceeding of „32<sup>nd</sup> International scientific conference Unconventional sources of electric energy“, Hrotovice, 2011, pp. 57-62, ISBN 978-80-02-02323-4 (in Slovak)

**8 Contact Address**

Department of Experimental Electrical Engineering  
Faculty of Electrical Engineering  
University of Žilina  
Satellite workplace Liptovský Mikuláš  
ul. kpt. J. Nálepku 1390  
031 01 Liptovský Mikuláš  
Slovak Republic  
Phone: ++421-41-5131483  
++421-44-5623977  
E-mail: [studijne@lm.uniza.sk](mailto:studijne@lm.uniza.sk)  
www: <http://www.lm.uniza.sk>

Katedra experimentálnej elektrotechniky  
Elektrotechnická fakulta  
Žilinská univerzita  
Detašované pracovisko  
ul. kpt. J. Nálepku 1390  
031 01 Liptovský Mikuláš  
Slovenská republika