TECHNICAL UNIVERSITY OF KOŠICE

FACULTY OF ELECTRICAL ENGINEERING AND INFORMATICS

ANNUAL REPORT 2016

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  doc. RNDr. Marián Klešč, PhD. – E-mail: marian.klesc@tuke.sk
- Computer Center (abbr. PC FEI)
  prof. Ing. Liberios Vokorokos, PhD. – E-mail: liberios.vokorokos@tuke.sk
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Foreword / Welcome from the Dean of the Faculty

Our goals:

We intend, we want ..

".. to be an attractive but simultaneously a pretentious faculty for students for whom the diploma awarded will open the doors on the job market,
.. to be an important research centre in field of electrical engineering and informatics both at home and abroad,
.. to be a faculty with friendly relations and excellent collegial atmosphere which enables creative activity of the teaching and research staff in hand with our students."

Ladies and Gentlemen,

It is my great pleasure to send you greetings from Slovakia as a Dean of Faculty of Electrical Engineering and Informatics, Technical University in Košice (TUKE). Slovakia is a country in central Europe. Our University is located in the Eastern Slovakia and we are very proud to live in the city of Košice, which is an old historical city with many historical buildings and places. Košice is also cultural and social centre of the Eastern part of the country and the second biggest city In Slovak Republic. The number of students currently attending nine TUKE faculties exceeds 9,000. Approximately 8,400 of them are full-time students, out of which there are 5,000 Bachelor students, 3,000 Master students and over 350 PhD students. Almost 900 teachers work here, and the same number of research and administrative staff.

Allow me to introduce Faculty of Electrical Engineering and Informatics, Technical University in Košice in Slovakia. Faculty is a school with approx. 2000 students and 159 teachers and research associates. We have 114 PhD students in our courses. We offer more than 30 courses for faculty education including Bc. (BSc.), Ing. (MSc.) and PhD in thee main branches: *Informatics*, *Telecommunications*, *Electric Power Engineering and Electrical Engineering*. In this publication can found more details about particular specialization.

Our teachers and research associates are highly qualified persons and very active in educational and research projects mainly in international co-operation. Faculty takes active role in 9 educational and 12 research international projects granted by agencies from EEC countries and also participates on more than 45 research projects granted by Slovak agencies. All this activity brings very interesting and highly valuable results.

There is a small community of 25 foreign students studying at our faculty. We hope that this community will grow and will appreciate our skills and good conditions for study here in Košice.

The main role of this publication is to inform you about results of the Faculty for last year and warmly invite readers for mutual co-operation and international contacts. We are open to any discussions about educational and research problems and we would highly appreciate any opportunity to meet with colleagues from other countries. I would like to express a warm invitation for our potential future students and underline that we provide a high profile teaching courses by experienced teachers and research associates.

Yours Sincerely,

Prof. Ing. Liberios Vokorokos, PhD.

CONTENTS

Košice and the Technical University

Košice – the metropolis of Eastern Slovakia – has more than 750 years rich history. It is an important administrative, business and industrial center, important crossing of road, railway and air traffic. The downtown has been reconstructed in last years and at present it belongs to the most beautiful and lovely cities in Slovakia. Towering over the center there is the gothic cathedral of St. Elisabeth, completed in 1508, the biggest and most important gothic monument and the only one of this kindin Eastern Europe. The town center is completed by the gothic St. Michael's Chapel and the East Slovak Theatre – imposing construction build in Neo-Baroque style. At present, there are approx. 240 thousands inhabitants in Košice and it is the second largest city In Slovakia.

The Technical University of Košice was established in 1952, but in the fact, the origin and roots of two from their faculties go back to the 18th century and they are derived from the Mining Academy in Banská Štiavnica. The University is a state-supported institution. At present, the University consists of nine faculties. It has more than 9 000 Master's and Bachelor's degree students, about 350 PhD. students and 800 academic staff members.

Faculty of Electrical Engineering and Informatics

The Faculty of Electrical Engineering and Informatics, has been one of the leaders In Slovak technical higher education since its establishment in 1969. Faculty consists of nine departments, one Centre of IT and a computing centre. The departments of the Faculty are located in the campus of the Technical University, which is located in 10-min. walk distance from the city center.

The Faculty is committed to providing its students with the best possible experience of education for their future career and leadership in their profession, for admission to advanced degree programs, and for lifelong learning. The faculty offers a wide variety of full-time and part-time courses, which are relevant to industry's needs. Graduates leave our departments well equipped to meet the needs of industry and development/research institutions and get their jobs with ease.

Statistics

- Present number of faculty staff members is 221 and among them 29 professors, 38 associate professors, 83 assistant professors, 9 research workers, 62 administrative staff and technicians.
- The number of BSc. students is approximately 1484, number of MSc. students is 577 and number of PhD students approximately 114, every year.

Number of the Bc. students in academic year 2016-2017

Bc. level			
1. year	**2. year**	**3. year**	**Sum**
725	409	350	1484

Number of the Ing. students in academic year 2016-2017

MSc. (Ing.) level		
1. year	**2. year**	**Sum**
315	262	577

Overall number of the students in academic year 2016-2017

Bc. level	MSc. (Ing.) level	PhD. level	Total number
1484	577	114	2175

The student numbers in the academic year 2016/17 by study programs area (number of students vs. study program).

Branch of study	Bc.	Ing.	PhD.	Total
Electric Power Engineering	129	63	12	204
Informatics	737	287	28	1052
Multimedia Communication Technologies	43	28	9	80
Intelligent Systems	80	45	18	143
Computer modeling	27	11	2	40
Business Informatics	177	87	7	271
Physical Engineering of Advanced materials	7	0	4	11
Electrotechnics systems	0	13	0	13
Electrical Systems	0	0	7	7
Electronic systems and signal processing	0	0	17	17
Industrial Electrical Engineering	41	23	3	67
Technology in Automotive Electronics	43	7	4	54
Automated Electrical Systems	83	0	0	83
Computer Networks	104	0	0	104
Smartelectronics	13	13	0	26
Telecommunications	0	0	1	1
Cybernetics and info control systems	0	0	1	1
Mechatronics systems	0	0	1	1
Total	**1484**	**577**	**114**	**2175**

Faculty Organization and Resources

DEAN'S OFFICE

The dean's office manages the Faculty life and offers services both for the students and staff members.

Management of the Faculty

Dean:	prof. Ing. Liberios Vokorokos, PhD.	
Vice-deans:	prof. Ing. Alena Pietriková, CSc.	responsible for research and development and doctoral studies
	Ing. Mária Gamcová, PhD.	responsible for the Faculty promotion and International Relationships
	doc. Ing. Ľubomír Beňa, PhD.	responsible for Bachelor and Master's studies
	prof. Ing. Ján Šaliga, PhD.	responsible for International projects coordinating and for publicising activities
	prof. Ing. Roman Cimbala, PhD.	responsible for development and External Relations
Faculty Secretary:		
	JUDr. Mária Girmanová Homzová	responsible for financial matters and dean's office management

FACULTY ACADEMIC BODIES

The Faculty Scientific Council Faculty and the faculty Academic Senate creates academic bodies of the Faculty having many control and checking functions and responsibilities that are stated in the Faculty Ruling Guide.

Faculty Scientific Board

The Scientific Board is an advisory board to the dean. The members of the Faculty Scientific Board are grouped from the vice-deans, heads of departments, professors and representatives from co-operating industrial companies. The Scientific Council plays decisive role at the Faculty development, orientation and research.

Faculty Academic Senate

The Faculty Academic Senate is the highest-level self-governmental body of the Faculty and is authorized to control and approve activities and issues of the Faculty Presidium. Every department elects one staff member as a representative into the Faculty Staff Chamber of the Faculty Academic Senate. Students also have their representatives in the Students' Chamber.

Professors Board

Professors Board is an advisory board to the dean. The members of the Professors Board are grouped form professors and extraordinary professors of faculty. Board was created from February, 1st 2007 and prepared references for dean of faculty.

DEPARTMENTS

The faculty consists from the following departments:

	abbr. (in Slovak language)
Department of Computers and Informatics	KPI
Department of Cybernetics and Artificial Intelligence	KKUI
Department of Electrical Engineering and Mechatronics	KEM
Department of Electric Power Engineering	KEE
Department of Electronics and Multimedia Telecommunications	KEMT
Department of Mathematics and Theoretical Informatics	KMTI
Department of Physics	KF
Department of Technologies in Electronics	KTE
Department of Theoretical and Industrial Electrical Engineering	KTPE

CENTRES OF EXCELLENCE

The faculty has two Centres of Excellence:

1. **Centre of Information and Communication Technologies for Knowledge Systems.**
   Head of the centre: prof. Ing. Dušan Kocur, PhD.
   Email: dusan.kocur@tuke.sk
   WEB: http://www.ce-ikt.fei.tuke.sk/
   The Center consists of:
   - Laboratory of Intelligent Interfaces of Communication and Information Systems
   - Labotratory of Knowledge Technologies
   - Laboratory of Progressive Communication Technologies

2. **Centre of Excellence of the Integrated Research and Exploitation of the Progressive Materials and Technologies in the Area of Automotive Electronics.**
   Head of the centre: prof. Ing. Alena Pietriková, PhD.
   Email: alena.pietrikova@tuke.sk
   WEB: http://ce3.fei.tuke.sk/
   The Center consists of:
   - Laboratory of Sensor and Communication Networks of Safe Automobile of the Future
   - Laboratory of EMC Electronic Devices and Biological Systems
   - Laboratory of Modeling and Measurement for Automotive Electronics
   - Laboratory of Automotive Electrotechnics
   - Technological Laboratory for Research of Progressive Materials for Automotive Electronics
   - Laboratory for Modification and Testing of Properties of Progressive Materials

COMPUTER CENTRE

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Head of the Centre: prof. Ing. Liberios Vokorokos, PhD.

The Centre offers services in field of computer technology: it maintains and supports majority of the faculty computing facilities both in HW and in SW. It also is responsible for maintenance and operation of the faculty computer network and networks information services, four PC laboratories with more than 50 personal computers that are working 24 hours/day and is responsible for the faculty information system. Each student of the Faculty has a free access to the Internet.

EDUCATION AND COURSES

Courses offered

The Faculty offers three types of full-time and part-time courses:

- Bachelor's Degree courses (3 years) leading to degree Bc.
- Master's Degree courses (2 years) leading to degree Ing.
- Doctoral Study courses (4 years) leading to degree PhD.

in various branches of study in electrical, electronic, automation and communication engineering and informatics.

Bachelor courses

Bachelor's Degree courses lasts in daily form 3 years. The graduates get more-or-less practical skills in mastering

- Informatics
- Electric Power Engineering
- Industrial Electrical Engineering
- Multimedia Communication Technologies
- Automated Electrical Systems
- Intelligent systems
- Computer modeling
- Physical Engineering of Advenced Materials
- Business Informatics
- Computer Networks
- Smartelectronics
- Technology in Automotive Electronics

Master's Degree courses

Master's degree courses lasts in daily form 2 years. The graduates are oriented towards the selected branch of specialization:

- Informatics
- Multimedia Communication Technologies
- Electrotechnics Systems
- Electric Power Engineering
- Computer modeling
- Technologies in Automotive Electronics
- Industrial Electrical Engineering
- Business Informatics
- Intelligent Systems
- Smartelectronics

PhD. courses

Ph.D. courses lasts in daily form 4 years:

- Electric Power Engineering
- Electrical Systems
- Informatics
- Business Informatics
- Industrial Electrical Engineering
- Electronic systems and Signal processing
- Multimedia communication technologies
- Technologies in automotive electronics
- Physical Engineering of advanced materials
- Intelligent Systems
- Computer modelling

Courses are available on full-time basis. One semester lasts 13 weeks and includes between 22 and 26 contact hours per week. The last semester is devoted to the independent work on final project done either at the faculty either in a real workplace situation. The learning activities cover traditional lectures, laboratory work, and seminars. Assessment methods vary from course to course and they consist of assignments, case studies, and examinations.

CREDIT-BASED SYSTEM

In all classes at the Faculty there is introduced a credit system enabling the student to choose the subjects according to their interests and to take the best race of learning. In the first two years, there are compulsory subjects for all students giving no freedom for choice. Since the third year, except several compulsory subjects, the student can choose from the list of optional subjects. A number of credits (usually 4-7) evaluates each subject. After passing the exam from the subject the student received the credits that are accumulated and the student should collect their minimum number (60) to pass the current year. Registration of the subjects is done before the beginning of the current academic year. The details

about the subjects and allocated numbers of credits are givenin the Program of Study.

RESEARCH AND DEVELOPMENT

The research at the Faculty's departments is oriented towards the fields, which are contained in both centres of excellence.

Research projects, which were co-ordinate by the Faculty staff members:

Category of projects	Number of projects
COST projects	11
7th EU program	0
Slovak – Hungarian program	1
Slovak – Portugal program	1
CEEPUS	2
Leonardo da Vinci	1
Erasmus program	1
Erasmus MUNDUS	1
TEMPUS program	1
Subtotal	**19**
National projects supported by VEGA	17
National projects supported by KEGA	15
National projects supported by APVV	8+4
National projects supported by CERN	1
Total	**64**

There are national and international projects at the Faculty. The national projects are supported by:

- The Scientific Grant Agency (VEGA) at Ministry of Education of Slovak Republic (grant research),
- The Cultural and Educational Grant Agency (KEGA) at Ministry of Education of Slovak Republic
- Slovak Research and Development Agency (APVV)
- The Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic for the Structural Funds of EU (Agency)

The projects are described in detail in the chapters giving the description of the departments.

The Faculty has intensive co-operation with industry: the most of results of applied research is realized in industrial enterprises. In 2016 there were accomplished 27 projects of such category at the Faculty.

The departments of the Faculty organize scientific conferences held usually in two-year intervals.

INTERNATIONAL CO-OPERATION

International co-operation presents one of the most important activities of the Faculty. The Faculty policy is oriented:

- towards creating conditions for co-operation in science and technology with the centers in Europe and USA,

- to increase the number and quality of the international research and educational projects,
- to support the mobility of the staff members to foreign institutions,
- towards acceptance the university teachers at the faculty for a certain teaching period,
- to increase the number of international students studying at the Faculty.

Except of co-operation with the partners' faculties in framework of Technical University's contracts there are several signed contracts with the company and faculties of the following universities: University of Oradea (Romania), Politechnika Czestochowska (Poland), Technical University of Ilmenau (Germany), The University of West Bohemia in Pilsen (Czech Republic), Faculty of Electrical Engineering, Czech Technical University, Prague (Czech Republic), Budapest University of Technology and Economics (Hungary), Université Jean Monnet de Saint-Etienne (France).

In framework of international co-operation, the Faculty is currently involved in the following projects:

CEEPUS program

- Active Methods in Teaching and Learning Mathematics, CIII-HU-0028-10-1617 (co-ordinator: Štefan Berežný, department: KMTI)
- International Cooperation in Computer Science, CIII-HU-0019-12-1617 (co-ordinator: Csaba Szabó, department: KPI)

Leonardo da Vinci program

- Virtual and Practical Applications to Electronic Assembling Technology (co-ordinator: Alena Pietriková, department: KTE)

COST projects

- Truthworthy Manufacturing and Utilization of Secure Device COST IC1204 (co-ordinator: Miloš Drutarovský, department: KEMT)
- Resilient communication services protecting end-user applications from disaster-based failures (RECODIS) – COST CA15127 (co-ordinator: Ľubomír Doboš, department: KEMT)
- Inclusive Radio Communication Networks for 5G and beyond (IRACON) COST CA15104 (co-ordinator: Ľubomír Doboš, department: KEMT)
- Integrating Biometrics and Forensics for the Digital age COST IC1106 (co-ordinator: Matúš Pleva, department: KEMT)
- Wireless Power Transmission for Sustainable Electronics (WiPE) COST IC1301 (co-ordinator: Pavol Galajda, department: KEMT)
- Algorithms, Architectures and Platforms for Enhanced Living environments COST IC 1303 (co-ordinator: Dušan Kocur, department: KEMT)
- Semantic keyword-based search on structured data sources COST IC 1302 (co-ordinator: Peter Butka, department: KKUI)
- Autonomous Control for a Reliable Internet of Services COST IC 1304 (co-ordinator: Peter Bednár, department: KKUI)

- Civil Engineering Applications of Ground Penetrating Radar COST TU 1208 (co-ordinator: Dušan Kocur, department: KEMT)
- Improving Applicability of Nature-Inspired Optimisation by Joining Theory and Practice (ImAppNIO) COST CA15140 (co-ordinator: Juraj Gazda, department: KPI)
- European network for cost containment and improved quality of health care COST CA15222 (co-ordinator: František Babič, department: KKUI)

Slovak – Hungarian program

- Výskum a vývoj modulov prejazykovo-adaptívne multimodálne rozhrania (co-ordinator: Stanislav Ondáš, department: KEMT)

Slovak – Portugal program

- Nová inžinierska disciplína: zelený softvér (co-ordinator: Csaba Szabó, department: KPI)

Erasmus projects

- INNOSOC – Inovative ICT Solutions for the Societal Challenges (contact: Ľubomír Doboš, Mária Gamcová, department: KEMT)

Erasmus MUNDUS

- THELXINOE: Erasmus Euro-Oceanian Smart City Network (contact: Ľubomír Doboš, department: KEMT)

TEMPUS program

- Technological Transfer Network (abbr.: TecTNet, co-ordinator: Ján Šaliga, department: KEMT)

DEPARTMENT OF COMPUTERS AND INFORMATICS

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kpi
Katedra počítačov a informatiky

ANNUAL REPORT 2016

Department of Computers and Informatics (DCI) has been a principal body of the Faculty of Electrical Engineering and Informatics (FEI) conducting the process of education and scientific research in the area of Computer science and engineering (CSE) since 1989. DCI is one of two successors of the former Department of Technical Cybernetics at the FEI.
Education at DCI covers all forms of university studies in CSE and DCI grants bachelor (Bc), master (Ing) and doctoral (PhD) degree in CSE.

DCI consists of 5 laboratories:

- Informatics and Computer Languages Laboratory
- Software Engineering Laboratory
- Information Systems Laboratory
- Computer Networks Laboratory
- Computer Architectures and Security Laboratory

DCI programs enrollment counts approx. 742 students in bachelor and 288 students in master programs. Number of doctoral students studying towards PhD degree is 27.

The graduates can work as system engineers, specialists for development, installation and maintenance of the information systems and technologies in wide spectrum of applications, designers of the computer systems, specialists dealing with research, development and operation of computer systems and their components.

Scientific research at DCI covers following fields:

- formal methods for design and analysis of discrete systems,
- programming paradigms and theory of programming,
- parallel and distributed programming, real time systems,
- methods, tools and methodologies of analysis and design of software systems,
- computer graphics and virtual reality systems,
- agent and service-based technologies for design and implementation of distributed software systems,
- modeling and simulation of systems,
- advanced database and information technologies,
- information systems security,
- e-learning systems, intelligent tutoring systems,
- parallel architectures for specialized high performance computer systems,
- theory of design of MIMD computer architecture - data-flow,
- computer networks and advanced network infrastructures,
- transfer of the multimedia nature information with the required quality of services parameters, effective methods of quality service property parameters assessment,
- implementation of the powerful streaming technologies in the IP network environment,
- videoconference solution and voice services of the new generation,
- monitoring, control and visualization of topologies in LAN and WAN,
- virtual communication infrastructures and their use in practical, e-learning technologies and their solutions.

2 STAFF

Professors:
prof. Ing. Štefan Hudák, DrSc.
prof. Ing. Ján Kollár, CSc.
prof. RNDr. Valerie Novitzká, PhD.
prof. Ing. Liberios Vokorokos, PhD.

Associate Professors:
doc. Ing. Ján Bača, CSc.
doc. Ing. Peter Drotár, PhD. (from 1.10.2016)
doc. Ing. Juraj Gazda, PhD.(from 1.10.2016)
doc. Ing. Ján Genči, PhD.
doc. Ing. Zdeněk Havlice, CSc.
doc. Ing. František Jakab, PhD.
doc. Ing. Jaroslav Porubän, PhD.
doc. Ing. Branislav Sobota, PhD.
doc. Ing. Milan Šujanský, CSc.
doc. Ing. Martin Tomášek, PhD.

Assistant Professors:

Ing. Norbert Ádám, PhD.
Ing. Michaela Bačíková, PhD.
Ing. Anton Baláž, PhD.
Ing. Miroslav Biňas, PhD.
Ing. Peter Drotár, PhD.
Ing. Sergej Chodarev, PhD.
Ing. Eva Chovancová, PhD.
Ing. Peter Feciľak, PhD.
Ing. Katarína Feciľaková, PhD.
Ing. Juraj Gazda, PhD.
Ing. Štefan Korečko, PhD.
Ing. Dominik Lakatoš, PhD.
Ing. Branislav Madoš, PhD.
Ing. Daniel Mihályi, PhD.
Ing. Miroslav Michalko, PhD.
Ing. Milan Nosáľ, PhD.
Ing. Marek Paralič, PhD.
Ing. Emília Pietriková, PhD.
Ing. William Steingartner, PhD.
Ing. Csaba Szabó, PhD.
Ing. Veronika Szabóová, PhD.
Ing. Slavomír Šimoňák, PhD.

Senior Scientists:

Ing. Igor Chudáčik
Ing. Ivan Klimek, PhD.
Ing. Dominik Lakatoš, PhD.
Ing. Jaroslav Lámer, PhD.
Ing. Marek Novák, PhD.

Technical Staff:

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Ing. Mária Halászová
Ing. Monika Kinyiková
Bc. Ivana Petrášová
Jozef Šefčík
Helena Švarcová

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Internal form:

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Ing. Zuzana Bilanová
Ing. Marek Čopjak
Ing. Zuzana Dankovičová
Ing. Aleš Deák
Ing. Emília Demeterová
Mohamed Ali M. Eldojali
Ing. Lukáš Galko
Ing. Ján Hurtuk
Ing. Ladislav Jacho
Ing. Ján Juhár
Ing. Milan Jančár
Ing. Ondrej Kainz
Ing. Michal Kovalčík
Ing. Jaroslav Lámer
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Ing. Milan Krendželák
Ing. Róbert Peťka
Ing. Ján Radušovský
Ing. Juraj Vízi

3 LABORATORIES

- Laboratory of Inteligent Interfaces for Information and Communication Systems (LIRKIS)
- Computer Networks Laboratory (www.cnl.sk)
- Computer Architectures and Security Laboratory
- Operating Systems Laboratory
- Software Engineering Laboratory
- Information Systems Laboratory
- Informatics and Computer Languages Laboratory
- Administration and Operational Support

4 TEACHING

4.1. Undergraduate Study (Bc.)

Subject	Semester	Lectures/ exercises (hours per week)	Name of Lecturer
Fundamentals of Algorithms and Programming	1st	3/2	Korečko, Pietriková, Sobota
Foundations of Software Engineering	2nd	2/2	Havlice
Principles of Computer Engineering	2nd	2/2	Vokorokos, Madoš
Programming	2nd	2/2	Biňas, Tomášek
Web Technologies	2nd	2/2	Korečko
Computer system architectures	3rd	2/2	Vokorokos, Ádám
Data Structures and Algorithms	3rd	2/2	Šimoňák
Object-Oriented Programming	3rd	2/2	Tomášek
Operating Systems	3rd	3/2	Genči
Assembler	4th	2/2	Šimoňák
Database Systems	4th	3/2	Nosáľ
Formal Languages	4th	3/2	Kollár
Computer Networks	4th	2/2	Jakab
Programming in .NET Environment	4th	2/2	Porubän
Component Programming	4th	2/2	Porubän
Bachelor Project	5th	2/6	Porubän
Research Methods	5th	2/2	Drotár, Gazda
Software Projects Management	5th	2/2	Szabó
User Interfaces of Software Systems	5th	2/2	Bačíková
Application Development for Smart Devices	5th	2/2	Biňas
Application of the Network Technologies	5th	2/2	Michalko
Bachelor Thesis	6th	3/9	Porubän
Development of Computer Games	6th	2/2	Sobota
Computer system architectures	6th	2/2	Vokorokos, Ádám
Internet Security	6th	3/2	Vokorokos, Baláž

4.2. Graduate study (Ing.)

Subject	Semester	Lectures / exercises (hours per week)	Name of Lecturer
Semantics of Programming Languages	1st	3/2	Novitzká, Steingartner
Current Trends in Informatics 1	1st	2/2	Porubän
Team Project	1st	2/2	Porubän
Computer Graphics	1st, 3th	3/2	Sobota
Data Processing Technologies and Systems	1st, 3th	2/2	Genči
Digital Systems Design Using VHDL	1st, 3th	2/2	Vokorokos, Chovancová
Distributed Systems	1st, 3th	2/2	Tomášek
Domain Specific Languages Development	1st, 3th	2/2	Porubän
Functional Programming	1st, 3th	3/2	Kollár
Modeling and Simulation	1st, 3th	2/2	Šujanský, Korečko
Requirements Engineering	1st, 3th	2/2	Havlice, Szabó
Routing Algorithms in Computer Networks	1st, 3th	2/2	Feciľak
Software Systems Evolution	1st, 3th	2/2	Szabó
Solving Problems of Large Scale Infrastructures	1st, 3th	2/2	Feciľak
Type Theory	1st, 3th	2/2	Novitzká
Cloud Systems	2nd	2/2	Tomášek
Current Trends in Informatics 2	2th	2/2	Porubän
Diploma Project 1	2nd	2/6	Vokorokos
Logics for Informaticians	2nd	2/2	Novitzká
Metaprogramming	2nd	2/2	Chodarev
Modelling and Prototyping of Systems	2nd	2/2	Havlice
Parallel Computer Systems	2nd	3/2	Ádám
SAP Administration	2nd	2/2	Baláž
Switched Networks based Technologies	2nd	2/2	Jakab
Technologies of Software Projects-I	2nd	2/2	Havlice
Verified Development of Systems	2nd	2/2	Korečko
Virtual Reality Systems	2nd	2/2	Sobota
Security in Computer Systems	3rd	2/2	Vokorokos, Baláž
Diploma Project 2	3rd	2/6	Vokorokos
Parallel Programming	3rd	2/2	Kollár
Diploma Thesis	4th	9/9	Vokorokos

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

All subjects listed in the table above are offered also in English language for foreign students.

5 RESEARCH PROJECTS

- *Improving Applicability of Nature-Inspired Optimisation by Joining Theory and Practice,* COST CA15140, duration: 2016–2020, coordinator: doc. Ing. Juraj Gazda PhD.

- *Intelligent Dynamic Spectrum Access Management for the Future Cognitive Communication Networks,* Slovak Research and Development Agency APVV-15-0055, duration: 2016–2019, coordinator: doc. Ing. Juraj Gazda, PhD.
- *Towards a Software Engineering Discipline for Green Software, Slovak Research and Development Agency SK-PT-2015-0037, duration: 2016–2017, coordinator: Ing. Szabó Csaba, PhD.*
- *Integrating software processes into the teaching of programming, Cultural and Educational Grant Agency KEGA No. 047TUKE-4/2016, duration: 2016-2018, coordinator: prof. Ing. Ján Kollár, CSc.*
- *Evaluation and metrics of domain usability, Faculty of Electrical Engineering and Informatics TUKE FEI-2015-16, duration: 2016, coordinator: Ing. Michaela Bačíková, PhD.*
- *Handwriting analysis for medical decision support systems, Faculty of Electrical Engineering and Informatics TUKE FEI-2015-5, duration: 2016, coordinator: doc. Ing. Peter Drotár, PhD.*
- *Coalgebraic models of component systems, Faculty of Electrical Engineering and Informatics TUKE FEI-2015-18, duration: 2016, coordinator: Ing. William Steingartner, PhD.*
- *Virtual-reality technologies in the process of handicapped persons education, Cultural and Educational Grant Agency KEGA No. 083TUKE-4/2015, duration: 2015-2017, coordinator: doc. Ing. Branislav Sobota, PhD.*
- *Promoting the interconnection of Computer and Software Engineering using the KPIkit, Cultural and Educational Grant Agency KEGA No. 077TUKE-4/2015, duration: 2015–2017, coordinator: Ing. Norbert Ádám, PhD.*
- *Agent based modeling of the spectrum distribution in the cognitive radio networks, Research Grant Agency VEGA No. 1/0766/14, duration: 2014–2016, coordinator: Ing. Juraj Gazda PhD.*
- *Integration of the Basic Theories of Software Engineering into Courses for Informatics Master Study Programmes at Technical Universities – Proposal and Implementation, Cultural and Educational Grant Agency KEGA No. 019TUKE-4/2014, duration: 2014-2016, coordinator: doc. Ing. Jaroslav Porubän, PhD.*
- *International Cooperation in Computer Science, CEEPUS No. CII-HU-0019-01-0506 (H81), duration: since 2005, coordinator: Ing. Csaba Szabó, PhD.*
- *Cisco Networking Academy Program – Regional Academy at DCI FEI TU, Cisco No. 8250, duration: since 1999, coordinator: doc. Ing. František Jakab, PhD.*
- *Cisco Networking Academy Program – Academy Support Center/Instructor training center/Cisco Academy DCI FEI TU, Cisco No. 8250, duration: since 1999, coordinator: doc. Ing. František Jakab, PhD. and Ing. Peter Feciľak, PhD.*

6 CO-OPERATION

6.1. Co-operation in Slovakia

- Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava
- Faculty of Management Science and Informatics, University of Žilina
- Department of Informatics, Armed Forces Academy of gen. M. R. Štefánik in Liptovský Mikuláš
- Department of Informatics, University in Trenčín
- Department of Informatics, Matej Bel University in Banská Bystrica
- Institute of Computer Science, Pavol Jozef Šafárik University in Košice

- Institute of Informatics, Slovak Academy of Sciences, Bratislava
- Department of Informatics, Constantine the Philosopher University, Nitra

6.1.1 Visitors to the Department

- doc. Ing. Valentino Vranić, Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- doc. Mgr. Daniela Chudá, PhD., Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- doc. Ing. Viera Rozinajová, PhD., Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- Ing. Katarína Jelemenská, PhD., Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- prof. Ing. Pavol Návrat, PhD., Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- Ing. Ivan Polášek, PhD., Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- doc. Ing. Ladislav Hudec, CSc., Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- Mgr. Jozef Tvarožek, PhD., Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- Mgr. Alena Kovárová, PhD., Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- Ing. Michal Barla, PhD., Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava, Slovakia
- doc. Ing. Jan Janoušek, Ph.D., Czech Technical University in Prague, Czech Republic
- doc. RNDr. Petr Šaloun, PhD., VŠB-Tehnical university of Ostrava, Czech Republic
- doc. RNDr. Ľubomír Dedera, PhD., Military Academy of gen. M. R. Štefanik in Lliptovský Mikuláš, Slovakia
- doc. Ing. Jiři Kunovský, CSc., Brno University of Technology, Czech Republic
- PaedDr. Mgr. Vladimír Siládi, PhD., Matej Bel University in Banská Bystrica, Slovakia
- doc. Ing. Jarmila Škrinárová, PhD., Matej Bel University in Banská Bystrica, Slovakia
- Ing. Dana Horváthová, PhD., Matej Bel University in Banská Bystrica, Slovakia
- Akademik prof. Ing. Ivan Plander, DrSc., Alexander Dubček University of Trenčín, Slovakia
- doc. Ing. Penka Martincová, PhD., Faculty of Management Science and Informatics, University of Žilina, Slovakia
- prof. Ing. Karol Matiaško, PhD., Faculty of Management Science and Informatics, University of Žilina, Slovakia
- doc. Ing. Emil Kršák, PhD., Faculty of Management Science and Informatics, University of Žilina, Slovakia
- prof. Ing. Mikuláš Alexík, PhD., Faculty of Management Science and Informatics, University of Žilina, Slovakia
- Assoc. Prof. Andreas Bollin, Alps Adriatic University of Klagenfurt, Austria
- Ioan Marius Pisk Lukáts, University of Cluj Napoca, Romania
- Dr. Mirjana Ivanovic, University of Novi Sad, Serbia
- Dr. Ivan Lukovic, University of Novi Sad, Serbia

- Davorka Radakovic, University of Novi Sad, Serbia
- Prof. Joao Saraiva, University of Minho, Braga, Portugal
- Marco Couto, Univeristy of Minho, Braga, Portugal

6.2. International Co-operation

- University of Ostrava, Czech Republic
- VŠB – Technical University of Ostrava, Czech Republic
- University of West Bohemia in Pilsen, Czech Republic
- Czech Technical University In Prague, Czech Republic
- Brno University of Technology, Czech Republic
- University of Hradec Králové, Czech Republic
- Masaryk University, Brno, Czech Republic
- Information Systems Institute, Technical University of Vienna, Austria
- Johannes Kepler University, Linz, Austria
- Alpen-Adria University, Klagenfurt, Austria
- University Koblenz-Landau, Germany
- University of Alcalá, Alcalá de Henares (Madrid), Spain
- University of Salamanca, Spain
- Eötvös Loránd University, Budapest, Hungary
- Budapest University of Technology and Economics, Budapest, Hungary
- University of Szeged, Hungary
- Technical University of Gdansk, Poland
- Warsaw University of Technology, Warsaw, Poland
- Czestochova University of Technology, Poland
- University of Oradea, Romania
- Babes-Bolyai University, Cluj-Napoca, Romania
- University of Maribor, Slovenia
- International Solomon University Kiew, Ukraine
- The National University of T. Schevchenko, Kiew, Ukraine
- Kharkov National University of Radioelectronics, Ukraine
- Uzhgorod National University, Ukraine
- ISTASE, Universite de St-Etienne, France
- Paisii Hilendarski University, Plovdiv, Bulgaria
- Politecnico di Milano Dipartimento di Electronica, Milano, Italy
- University of Rome, Italy
- Polytechn. Eng. College, Subotica, Serbia
- University of Jyväskylä, Finland
- Jyväskylä University of Applied Sciences, School of Information Technology, Finland
- University of Minho, Portugal
- Instituto Politécnico de Bragança, Bragança, Portugal
- NTNU, Institutt for Telematikk, Trondheim, Norway
- Bay Zoltán Nonprofit Ltd. for Applied Research, Institute for Logistics and Production Engineering (BAY-LOGI), Miskolc, Hungary
- University of Novi Sad, Faculty of Sciences, Novi Sad, Serbia
- Institute For Language and Speech Processing, Athena Research Center, Athens, Greece
- Digital EUROPE, EUROPEAN SCHOOLNET, Belgium, Brussels
- Cisco Technical Assistance Center Krakow, Poland

- Erasmus Centre for Entrepreneurship, Rotterdam, Netherlands
- Science and Engineering Institute, Dubai, United Arab Emirates
- BAYLOGI, Miskolc, Hungary

6.2.1. Visits of Staff Members to Foreign Institutions

- doc. Ing. Juraj Gazda, PhD., CA COST, Brussels, Belgium
- Ing. William Steingartner, PhD., Johannes Kepler University of Linz, Austria (CEEPUS)
- doc. Ing. Ján Genči, PhD., PARSEME, Struga, Macedonia
- doc. Ing. Peter Drotár, PhD., Budapest University of Technology and Economics, Hungary
- doc. Ing. Juraj Gazda, PhD., Budapest University of Technology and Economics, Hungary
- Ing. Ondrej Kainz, ICRV 2016, Tokyo, Japan
- Ing. Csaba Szabó, PhD., University of Minho, Braga, Portugal
- doc. Ing. Jaroslav Porubän, PhD., University of Minho, Braga, Portugal
- doc. Ing. Branislav Sobota, PhD., University of Minho, Braga, Portugal
- Ing. Michaela Bačíková, PhD., HSI 2016, Portsmouth, United Kingdom
- Ing. Lukáš Galko, PhD., HSI 2016, Portsmouth, United Kingdom
- Ing. Ján Hurtuk, SACI 2016, Temesvar, Romania
- Ing. Csaba Szabó, PhD., MACS 2016, Eger, Hungary
- Ing. William Steingartner, PhD., MACS 2016, Eger, Hungary
- Ing. Ján Perháč, MACS 2016, Eger, Hungary
- Ing. Norbert Ádám, PhD., Czech Technical University in Prague, Czech Republic
- prof. RNDr. Valerie Novitzká, PhD., MMFT 2016, Hucisko, Poland
- Ing. William Steingartner, PhD., MMFT 2016, Hucisko, Poland
- Ing. Milan Nosáľ, PhD., FedCSIS 2016, Gdansk, Poland
- Ing. Sergej Chodarev, PhD., FedCSIS 2016, Gdansk, Poland
- Ing. Michal Sičák, FedCSIS 2016, Gdansk, Poland
- doc. Ing. Ján Genči, PhD., Education, Research & Development, Elenite, Bulgaria
- doc. Ing. Ján Genči, PhD., HrTAL 2016, Dubrovnik, Croatia
- doc. Ing. Ján Genči, PhD., Masaryk University, Brno, Czech Republic
- Ing. William Steingartner, PhD., CECIIS 2016, Varazdin, Croatia
- doc. Ing. Juraj Gazda, PhD., ICMI 2016, Dubai, United Arab Emirates
- doc. Ing. Peter Drotár, PhD., ICMI 2016, Dubai, United Arab Emirates
- Ing. Matúš Sulír, SPLASH 2016, Amsterdam, Netherlands
- Ing. Ján Juhár, SPLASH 2016, Amsterdam, Netherlands
- Ing. William Steingartner, PhD., RISC Institut, Hegenberg, Austria
- Ing. Miroslav Michalko, PhD., CEEC, Nanjing, Jiangsu, China
- Ing. Igor Chudáčik, NetAcademy Partner Summit, Berlin, Germany
- Ing. Peter Feciľak, PhD., NetAcademy Partner Summit, Berlin, Germany
- doc. Ing. Juraj Gazda, PhD., EUMAS 2016, Valencia, Spain
- Ing. Juraj Mihaľov, INES 2016, Budapest, Hungary
- Ing. Matúš Uchnár, INES 2016, Budapest, Hungary
- Ing. Juraj Mihaľov, POSTER 2016, Prague, Czech Republic

6.3. Membership in International Organizations and Societies

- Bača, J., Genči, J., Havlice, Z., Hudák, Š., Kollár, J., Korečko, Š., Novitzká, V., Porubän, J., Sobota, B., Šujanský, M., Tomášek, M.: Members of the CSSS - Czech and Slovak Society for Simulation
- Genči, J., Paralič, M.: Members of Association for Computing Machinery, New York, USA
- Hudák, Š.: Member of Publishing Board of Communications of The International Solomol University: Mathematical Methods in Cybernetics, Kiev, Ukraine
- Jakab, F.: Member of EMEA NetAcad team, Bedfont Lakes, Feltham, Middlesex, United Kingdom
- Jakab, F.: Member of the Institute of Electrical and Electronics Engineers
- Novitzká, V.: Member of European Association of Programming Languages and Systems
- Novitzká, V.: Member of Common Framework Initiative, European Strategic Programme for Research in Information Technology WG 29432
- Novitzká, V.: Member of European Association of Theoretical Computer Science
- Paralič, M.: Member of the Institute of Electrical and Electronics Engineers
- Steingartner, W.: Member of the program committee of the international conference CECIIS – Central European Conference on Intelligent and Information Systems, Croatia
- Šujanský, M.: Member of CSSIM/Scientific Association

6.4. Membership in Slovak Organizations and Societies

- Bača, J., Biňas, M., Genči, J., Havlice, Z., Hudák, Š., Chodarev, S., Kollár, J., Korečko, Š., Mihályi, D., Novitzká, V., Paralič, M., Porubän, J., Steingartner W., Sobota, B., Szabó, Cs., Šimoňák, S., Šujanský, M., Tomášek, M., Vokorokos, L.: Members of the SSAKI - „Slovak Society for Applied Cybernetics and Informatics"
- Genči, J., Havlice, Z., Kollár, J., Novitzká, V., Paralič, M., Sobota, B.: Members of the Slovak Society for Computer Science (SSCS)
- Genči, J.: The Second TU Košice representative in EUNIS-SK
- Havlice, Z.: Scientific board of the Faculty of Electrical Engineering and Informatics, Technical University of Košice
- Havlice, Z.: Scientific board of the Faculty of Faculty of Management Science and Informatics, Technical University of Žilina
- Havlice, Z.: State Examination Commission for state exams in the study field Computer Engineering and Informatics at the Faculty of Electrical Engineering and Informatics of Technical University of Košice
- Havlice, Z.: State Examination Commission for state exams in the study field Applied Informatics and Automation in Industry at the Faculty of Materials Science and Technology of Slovak University of Technology in Bratislava
- Hudák, Š.: Member of Slovak Commission for Defense of DrSc dissertation in the scientific field Computer Engineering and Informatics
- Hudák, Š.: Member of the Common Scientific Commission for Defense of PhD dissertation in the field „Computer Tools and Systems"
- Hudák, Š.: Member of examinational board for AMBI project In Slovak Republic EXIN.SR
- Jakab, F.: Communication Technology Forum in SR (since 1997, Head of the application section, www.ctf.sk)
- Jakab, F.: Chairman of Committee on Business-Academic Cooperation,

American Chamber of Commers in Bratislava
- Jakab, F.: Coordinator of the Cisco Networking Academy program for Slovakia
- Jakab F.: Member of Košice IT Valley association board of directors
- Jakab F.: Member of working group ICT – Research and development, Ministry of Education
- Kollár, J.: Member of the review group of the Journal of Electrical Engineering
- Kollár, J.: Member of the review group of the Computers and Informatics journal
- Kollár, J.: Member of the program committee of the international conference ICETA – International Conference on Emerging Telecommunications Technologies and Applications, Košice, Slovak Republic
- Kollár, J.: Member of Common Scientific Commission for Defense of PhD dissertation in the field „Programm and Information System“
- Šujanský, M.: Member of the Board of the SSAKI - „Slovak Society for Applied Cybernetics and Informatics”
- Šujanský, M.: EUNIS – the Board of the Association for Information Technologies
- Vokorokos, L.: Member of the Common Scientific Commission for Defense of PhD dissertation in the field „Computer Tools and Systems“.
- Vokorokos, L.: Member of the editorial board of the scientific international journal "Transport and Logistics International Journal".
- Vokorokos, L.: Vice-chairman of the editorial board of the scientific journal - "Transactions of the Universities of Košice".
- Vokorokos, L.: Member of the editorial board of the scientific journal "Acta Avionica".
- Vokorokos, L.: Member of the Scientific board at the Technical University of Košice.
- Vokorokos, L.: Member of the Scientific board at the Faculty of Electrical Engineering and Informatics, Technical University of Košice.
- Vokorokos, L.: Member of the Common Scientific Commission for Defense of PhD dissertation in the field "Informatics".
- Vokorokos, L.: Member of the Board for development and informatization of the Technical University in Košice
- Vokorokos, L.: Member of the Expert group for informatization and development, TU-FEI, Košice

6.5. Contracts, International Scientific Projects

- Cooperation with companies:
  - Astound Commerce s.r.o.
  - bart.sk s.r.o.
  - Cisco (www.cnl.sk)
  - ELCOM, s.r.o., Prešov
  - Fpt Slovakia, s.r.o.
  - GEODETICCA, s.r.o.
  - GlobalLogic Slovakia s.r.o.
  - Hotovo, s.r.o.
  - IBM Slovensko, spol. s r.o.
  - IPsoft Slovakia s.r.o.
  - localhost, s.r.o.
  - matsuko, s.r.o.
  - NESS KE s.r.o.
  - PWC Avis, s.r.o.

- Red Hat Czech, s.r.o.
- Senacor Technologies AG
- Siemens Healthcare s.r.o.
- Software AG Development Center Slovakia, s.r.o.
- T-Systems Slovakia s.r.o.
- Východoslovenská distibučná, a.s.
- Wirecard Technologies GmbH

- Cooperation with the Stredná priemyselná škola dopravná, Košice

7 THESES

Thesis type	Bachelor	Master	Doctoral
Number	147	115	8

8 OTHER ACTIVITIES

8.1. Symposia, Workshops, Conferences, Seminars

- ICETA 2016 – IEEE 14th International Conference on Emerging eLearning Technologies and Applications, November 24–25, 2016, The High Tatras, Slovakia (DCI co-operation)

8.2. Activities in cooperation with commercial partners

- Live IT Projects 2016, January 20, 2016, Košice – presentation of student projects developed in cooperation with IT companies
- Extrapolácie 2016, September 26–November 31, 2016, Košice and Bratislava – exhibition devoted to history and future of IT in Slovakia
- T-Systems Hackathon 2016, November 26–27, 2016, in Košice – Largest Hackathon in Slovakia
- Beat_IT!, December 8, 2016, Košice – presentation and comparison of different technologies by experienced developers

9 PUBLICATIONS

9.1. Books

1. STEINGARTNER, W.: Základy informatiky a výpočtovej techniky - [1. vyd.] - Košice : Technická univerzita v Košiciach - 2016. - 157 s. [CD-ROM]. - ISBN 978-80-553-2593-4.
2. SOBOTA, B.: Stereoskopia - 1. vyd. - Košice : Technická univerzita v Košiciach - 2016. - 106 s.. - ISBN 978-80-553-3025-9.

9.2. Journals

1. PASTIRČÁK, J. - FRIGA, L. - KOVÁČ, V. - GAZDA, J. - GAZDA, V.: An Agent-Based Economy Model of Real-Time Secondary Market for the Cognitive Radio Networks - 2016. In: Journal of Networks and System Management. Vol. 24, no. 2 (2016), p. 427-443. - ISSN 1064-7570

2. DROTÁR, P. - MEKYSKA, J. - REKTOROVÁ, I. - SMÉKAL, Z. - FAUNDEZ-ZANUY, M. - MASÁROVÁ, L.: Evaluation of handwriting kinematics and pressure for differential diagnosis of Parkinson's disease - 2016. In: Artificial Intelligence in Medicine. Vol. 67 (2016), p. 39-46. - ISSN 0933-3657
3. SULÍR, M. – NOSÁĽ, M. – PORUBÄN, J.: Recording concerns in source code using annotations - 2016. In: Computer Languages, Systems & Structures. Vol. 46 (2016), p. 44-65. - ISSN 1477-8424
4. CHODAREV, S. - KOLLÁR, J.: Extensible Host Language for Domain-Specific Languages - 2016. In: Computing and Informatics. Roč. 35, č. 1 (2016), s. 84-110. - ISSN 1335-9150
5. PERHÁČ, J. - MIHÁLYI, D. - NOVITZKÁ, V.: Between syntax and semantics of resource oriented logic for IDS behavior description - 2016. In: Journal of Applied Mathematics and Computational Mechanics. Vol. 15, no. 2 (2016), p. 105-118. - ISSN 2353-0588
6. KOLLÁR, J. - SIČÁK, M. - SPIŠIAK, M.: Abstraction of meaningful symbolized objects - 2016. In: Open Computer Science. Vol. 6, no. 1 (2016), p. 108-115. - ISSN 2299-1093
7. STEINGARTNER, W. - NOVITZKÁ, V.: Categorical model of structural operational semantics for imperative language - 2016. In: Journal of Information and Organizational Sciences. Vol. 40, no. 2 (2016), p. 203-219. - ISSN 1846-3312
8. LÁMER, J. - JAKAB, F.: Video based in-space orientation model for artificial intelligence systems - 2016. In: International Journal of Electronics and Electrical Engineering. Vol. 4, no. 4 (2016), p. 341-345. - ISSN 2301-380X
9. KAINZ, O. - JAKAB, F. - MICHALKO, M. - FECIĽAK, P.: Detection of Persons and Height Esatimation in Video Sequence - 2016. In: International Journal of Engineering Sciences & Research Technology. Vol. 5, no. 3 (2016), p. 603-609. - ISSN 2277-9655
10. KAINZ, O. - JAKAB, F. - MICHALKO, M. - FECIĽAK, P.: The Extraction of Selected Facial Features from the Static Image in the Estimation of Age - 2016. In: International Journal of Engineering Sciences & Research Technology. Vol. 5, no. 3 (2016), p. 610-614. - ISSN 2277-9655
11. ELDOJALI, Mohamed Ali M. - STEINGARTNER, W.: Algebras and current limitations and intersection types - 2016. In: Interdisciplinarity in Theory and Practice. No. 9 (2016), p. 186-190. - ISSN 2344 - 2409
12. MADOŠ, B. - CICHOVSKÁ, N. - ZORKOVSKÝ, M. - FEDORČÁK, M.: Computationally Intensive Medical Application Using Mobile Device and Raspberry PI - 2016. In: International Journal of Engineering and Applied Sciences. Vol. 3, no. 6 (2016), p. 97-100. - ISSN 2394-3661
13. PERHÁČ, J. - MIHÁLYI, D.: Coalgebraic Specification of Network Intrusion Signatures - 2016. In: Studia Universitatis Babes-Bolyai: Informatica. Vol. 61, no. 2 (2016), p. 83-94. - ISSN 2065-9601
14. LUKÁČ, G. - SABOL, T. - TOMÁŠEK, M. - FURDÍK, K.: A process-oriented service infrastructure for networked enterprises - 2016. In: Electronic Commerce Research and Applications. Vol. 21 (2016), p. 1-16. - ISSN 1567-4223
15. PIETRIKOVÁ, E.: Audience Response Systems: Benefits & Utilization - 2016. In: Acta Electrotechnica et Informatica. Roč. 15, č. 4 (2016), s. 3-7. - ISSN 1338-3957

16. PIETRIKOVÁ, E. - CHODAREV, S.: Towards Programmer Knowledge Profile Generation - 2016. In: Acta Electrotechnica et Informatica. Roč. 16, č. 1 (2016), s. 15-19. - ISSN 1335-8243
17. BALÁŽ, A. - ÁDÁM, N.: Peer to Peer System Deployment - 2016. In: Acta Electrotechnica et Informatica. Roč. 16, č. 1 (2016), s. 11-14. - ISSN 1335-8243
18. MIHAĽOV, J. - CHOVANCOVÁ, E.: Hĺbkové senzory a ich budúcnosť s technológiou Ultra Wide Band - 2016. In: Posterus. Roč. 9, č. 8 (2016), s. 1-9. - ISSN 1338-0087
19. JUHÁR, J. - VOKOROKOS, L.: Exploring Projections as a Tool for Concern Management - 2016. In: Acta Electrotechnica et Informatica. Roč. 16, č. 3 (2016), s. 26-31. - ISSN 1335-8243
20. GALKO, L. - PORUBÄN, J.: Tools Used in Ambient User Interfaces - 2016. In: Acta Electrotechnica et Informatica. Roč. 16, č. 3 (2016), s. 32-40. - ISSN 1335-8243
21. MIHAĽOV, J. - LEŠČIŠIN, Ľ.: Robot Snail - 2016. In: Posterus. Roč. 9, č. 7 (2016), s. 1-5. - ISSN 1338-0087

9.3. Other publications

Publication Type	Confereces		Other
	Foreign	Home	
Number	17	34	32

DEPARTMENT OF CYBERNETICS AND ARTIFICIAL INTELLIGENCE

Head of Department
prof. Ing. Peter Sinčák, CSc.
E-mail: peter.sincak@tuke.sk

http://www.tuke.sk/kkui/, tel./Fax: ++421 55 602 2575

ANNUAL REPORT 2016

The Department of Cybernetics and Artificial Intelligence (DCAI) is responsible for education in two study programs: Intelligent Systems, and Business Information Systems at all three levels of university education (bachelor, master and PhD).

The main research topics at the DCAI are intelligent and cognitive robotics with the aim to develop learnable collaborative robot systems, interactive intelligent environment able to perceive and recognise activities and events, cloud computation, data science, knowledge management, semantic technologies, intelligent decision support systems, processing and analysis of the large volume and continuous data in real-time, Internet of things, Industry 4.0, modern control theory and fault tolerant control design, cyber-physical systems, under-actuated and actuated nonlinear dynamical systems, flexible manufacturing systems, collective intelligence and computer vision.

The predecessor of the Department was founded in 1964. Department of Cybernetics and Artificial Intelligence was adapted in 1989. Currently it has 26 staff members and 26 internal PhD. students. There are 3 research centers within the department: Center of Intelligent Technologies (http://www.cloudai.sk/), Center of Applied Cybernetics (http://kkui.fei.tuke.sk/info/cak) and Center of Business Information Systems (http://kkui.fei.tuke.sk/chi/). The Department is involved in a number of research and educational projects (see below).

2 STAFF

Professors:	prof. Ing. Dušan Krokavec, CSc. prof. RNDr. Eva Ocelíková, CSc. prof. Ing. Ján Paralič, PhD. prof. Ing. Tomáš Sabol, CSc. prof. Ing. Ján Sarnovský, CSc. prof. Ing. Peter Sinčák, CSc. prof. Ing. Iveta Zolotová, CSc.
Associate Professors:	doc. Ing. Peter Butka, PhD. doc. Ing. Anna Filasová, CSc. doc. Ing. Anna Jadlovská, PhD. doc. Ing. Ján Jadlovský, CSc. doc. Ing. Marián Mach, CSc. doc. Ing. Kristína Machová, CSc.
Assistant Professors:	Ing. František Babič, PhD. Ing. Peter Bednár, PhD. Ing. Vladimír Gašpar, PhD. Ing. Slávka Jadlovská, PhD. Ing. Rudolf Jakša, PhD. Ing. Peter Papcun, PhD. Ing. Martin Sarnovský, PhD. Dr. Ing. Ján Vaščák Ing. Mária Virčíková, PhD.
Researchers:	Ing. Marek Bundzel, PhD. Ing. Gabriel Tutoky, PhD.
Technical Staff:	Tatiana Baňasová Renáta Giannusis

Ph.D. Students (internal):

1st.	Ing. Norbert Ferenčík Ing. Erik Kajáti Ing. Patrik Sabol Ing. Zuzana Vantová
2nd.	Ing. Martin Čertický Ing. Jozef Mocnej Ing. Anna Novická Ing. Miroslav Smatana Ing. Peter Takáč Ing. Michal Vadovský

	Ing. Dominik Vošček
	Ing. Michal Varga
3rd.	Ing. Ján Čabala
	Ing. Jakub Hvizdoš
	Ing. Martin Mikula
	Ing. Martin Miškuf
	Ing. Miroslava Muchová
	Ing. Jaroslav Ondo
	Ing. Matej Oravec
4th.	Ing. Tomáš Cádrik
	Ing. Michal Kopčík
	Ing. Tomáš Lojka
	Ing. Gergely Magyar
	Ing. Ladislav Nyulászi
	Ing. Michal Puheim
5th.	Ing. Martina Tarhaničová

3 RESEARCH TEAMS

- Data science - primarily focused on methods and models for analysis of different types of data and models and methods for the processing and analysis of large volumes of data and continuous flows of data in real-time. (http://kkui.fei.tuke.sk/chi/?path=english)
- Fault-tolerant and Robust Control - primarily focused on innovative control design techniques exploiting convex optimization problems with constraints and disturbance suppression, models and algorithms for processing and synthesis of robust control of dynamical systems working under system model uncertainties and severe failure conditions and design, implementation and experimental verification of methods guarantying system fault tolerance and reconfiguration structures of control.
- Modern Control Techniques and Industrial Informatics - primarily focused on methods and developing resources for hybrid modeling and control of cyber-physical systems, new methods and algorithms for modeling, identification, control and diagnostics of under-actuated and actuated nonlinear dynamical systems, research and development of flexible manufacturing systems, automated and robotic production lines and the design of diagnostic systems focused on diagnostics of vibration and chatter for the cyber systems. (http://kyb.fei.tuke.sk/laben/)
- Intelligent Cybernetics Systems - primarily focused on machine learning algorithms, collective intelligence, and optimalization, and computer vision, intelligent and cognitive robotics, smart living, intelligent space topics, sensors nets, intelligent gateways and processing with IoT/IoE and cloud technologies in smart industry, smart manufacturing control systems, and multiagent robotics systems. (http://cybereducentre.fei.tuke.sk/)
- Intelligent Technologies and Systems - primarily focused on intelligent robotics (to develop learnable collaborative robot systems), interactive intelligent environment able to perceive and recognise activities or events, and cloud computation (AI bricks – modular services providing functionality of selected artificial intelligence methods). (http://www.cloudai.sk/index.php/en/events/)

4 TEACHING

4.1 Undergraduate Study (Bc.)

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Basics of Intelligent Systems	2nd	2/2	Sinčák
Introduction to Automatic Control	2nd	2/2	Jadlovská A., Jadlovský
Introduction to Business Informatics	2nd	2/2	Paralič
Industry 4.0.	3rd	2/2	Zolotová Papcun
Simulation Systems	3rd	2/2	Jadlovská A., Jadlovská S.
Simulation systems in Business Information Systems	3rd	2/2	Butka
Project Management	3rd,5th	2/2	Babič
Knowledge-Based Systems	3rd,5th	2/2	Machová
Single chip computers	3rd	2/2	Jadlovský
Information Systems Analysis and Design	4th	2/2	Babič, Sarnovský M.
Control and Visualization Systems	4th,5th	2/2	Zolotová Papcun
Intelligent Decision Making Systems	4rd,5th	2/2	Mach
Control System Components	3rd,4rd	2/2	Vaščák
Web Technologies	4th,6th	2/2	Bednár
Control of Technological Processes	4th	2/2	Jadlovský
Scheduling and Logistics	4th	2/2	Paralič Butka
Optimal Control of Hybrid Systems	5th	2/2	Jadlovská A.
Intelligent Robotics	5th	2/2	Bundzel
Business Analytics	5th	2/2	Butka
Neural Networks	5th	2/2	Sinčák
Models and control of industrial processes (MRPP)	5th	2/2	Filasová, Jadlovská S.
Computer Systems in Control	5th	2/2	Jadlovský
Optimisation in Economic Processes	5th	2/2	Filasová
Business Informatics in practice	6th	2/2	Babič
Service Robotics	6th	2/2	Virčíková
IT Management	5th,6th	2/2	Sarnovský M.
Selected topics in cybernetics II	6th	2/2	Sarnovský J.

4.2 Graduate Study (Ing.)

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Discret Control of Dynamic Systems	1st	2/2	Filasová
Computer Vision	1st	2/2	Bundzel
Humanoid Technologies	1st,3rd	2/2	Sinčák Virčíková
Computer Systems in Control	1st	2/2	Jadlovský

Architectures of Industrial Information Systems	1st	2/2	Zolotová
Engineering Econometrics	1st	2/2	Krokavec
Knowledge Discovery	1st	2/2	Paralič, J.
Machine Learning	1st	2/2	Machová
Heuristic Optimization Processes	1st	2/2	Mach
Control and Artificial Intelligence	2nd	2/2	Jadlovská
Technologies for Big Data Processing	2nd	2/2	Bednár, Sarnovský M.
Evolutionary Algorithms	2nd	2/2	Mach
Distributed Control Systems	2nd	2/2	Jadlovský
Decision making and complexity	2nd	2/2	Gašpar
Hybrid Computational Intelligence	2nd	2/2	Vaščák
Control and Visualisation Systems	2nd	2/2	Zolotová Papcun
Knowledge Management	3rd	2/2	Paralič, J.
Management Information Systems	3rd	2/2	Jadlovský
Diagnostics and Robust Control	3rd	2/2	Filasová
Advanced methods of computer vision	3rd	2/2	Bundzel
Cognitive Robotics	3rd	2/2	Bundzel
Semantic and Social Web	3rd	2/2	Machová
Languages for Intelligent Systems	3rd	2/2	Mach
Interactive Systems	3rd	2/2	Sinčák
New Trends in Business Information Systems	4th	2/2	Paralič

5 RESEARCH AND EDUCATIONAL PROJECTS

- *Semantic keyword-based search on structured data sources (KEYSTONE),* COST Action IC 1302, European Cooperation in Science and Technology, duration: 2014 – 2017, members from our department: Peter Butka (Management Committee member for Slovakia), Peter Bednár, Martin Sarnovský, Ján Paralič
- *Autonomous Control for a Reliable Internet of Services (ACROSS),* COST Action IC 1304, European Cooperation in Science and Technology, duration: 2013 – 2016, members from our department: Peter Bednár (Management Committee member for Slovakia)
- *European Network for cost containment and improved quality of health care*, COST Action CA15222, European Cooperation in Science and Technology, duration: 2016 – 2020, members from our department: František Babič (Management Committee member for Slovakia)
- *ALICE Experiment at the LHC at CERN – study of strongly interacting matter under extreme conditions***,** International project of basic research, duration: 2016 – 2020, members from our department: Ján Jadlovský (Team Leader for TUKE), Slávka Jadlovská (Deputy Team Leader), Anna Jadlovská, Jakub Čerkala, Michal Kopčík, Matej Oravec, Ján Čabala, Michal Varga, Dominik Vošček
- *Resident core of active reconfigurable control systems***,** Scientific Grant Agency project No. 1/0348/14, duration: 2014 – 2016, members: Dušan Krokavec (project leader), Filasová Anna
- *Methods and models for analysis of data streams*, Scientific Grant Agency project No. 1/0493/16, duration: 2016 – 2019, members: Ján Paralič (project

leader), Martin Sarnovský, Peter Bednár, František Babič, Peter Butka, Kristína Machová, Vladimír Gašpar, Michal Vadovský, Miroslav Smatana, Miroslava Muchová, Martin Mikula, Cecília Havrilová

- *Integration of study programs Cybernetics and Artificial Intelligence***.** Cultural and Education Grant Agency Project No. 034TUKE-4/2014, duration 2014 – 2016, members: Ján Vaščák (project leader), Anna Jadlovská, Mária Virčíková, Rudolf Jakša, Peter Sinčák, Marián Mach, Kristína Machová
- *CyberLabTrainSystem – demonstrational and training of informationcontrol systems* – innovation*.* Cultural and Education Grant Agency Project No. 001TUKE-4/2015, duration 2015 – 2017, members: Iveta Zolotová (project leader), Marek Bundzel, Peter Papcun, Ján Sarnovský, Anna Jadlovská, Ján Jadlovský, Slávka Jadlovská, Tomáš Lojka, Peter Michalik, Martin Miškuf, Jozef Mocnej, Jakub Čerkala, Michal Kopčík, Dominik Vošček, Michal Varga, Matej Oravec, Ján Štofa, Ján Čabala, Anna Novická, Michal Puheim
- *Introduction of Education in Big Data Analytics.* Cultural and Education Grant Agency Project No. 025TUKE-4/2015, duration 2015 – 2017, members: Ján Paralič (project leader), Martin Sarnovský, Peter Bednár, František Babič, Peter Butka, Kristína Machová, Marián Mach, Michal Vadovský, Miroslav Smatana, Miroslava Muchová, Martin Mikula, Zuzana Vantová
- *Digitalization, virtualization and testing of a small turbojet engine and its elements using stands for modern applied lecturing,* Cultural and Education Grant Agency Project No. 014TUKE-4/2015, duration 2015 – 2017, members: Peter Butka (previously Ladislav Madarász) - project leader, Rudolf Andoga (project vice leader), Tobiáš Lazar, Ladislav Főző, Vladimír Gašpar, Jozef Judičák, Michal Puheim, Ladislav Nyulászi, and Róbert Bréda
- *University Science Park TECHNICOM for Innovation Applications Supported by Knowledge Technology*, ITMS: 26220220182, supported by the Research & Development Operational Programme funded by the ERDF. Three pilot projects are performed at our department:
  - PP4: IT tools and services for analysis of various types of processes, Ján Paralič - pilot project leader, members: František Babič, Gabriel Tutoky, Martin Sarnovský, Peter Bednár, Peter Butka, Alexandra Lukáčová, Vladimír Gašpar, Cecília Havrilová, Michal Puheim, Miroslava Muchová, Martin Mikula
  - PP5 – Cloud and dynamic services for distributed. intelligent and mobile networks: lead by Frantisek Jakab from DCI, from DCAI have been participating: Iveta Zolotová, Peter Michalik, Tomáš Lojka, Martin Miškuf
  - PP6: Use of artificial intelligence in intelligent systems, Peter Sinčák- pilot project leader
  - PP7: Center for Nondestructive Diagnostics of Technological Processes Using Standard Software for Control and Communication, Ján Jadlovský - pilot project leader, members: Ján Sarnovský, Anna Jadlovská, Iveta Zolotová, Slávka Jadlovská, Peter Papcun, Jakub Čerkala, Michal Kopčík, Matej Oravec, Ján Čabala
- Transfer *of the IoT open cloud platform into industry*, IBM Country Project *Innovation* Award. Project leader: Iveta Zolotová, members: Tomáš Lojka, Marek Bundzel, Martin Miškuf, Jozef Mocnej, Michal Puheim, students
- *Pilot laboratory projects - IoT with IBM*. IBM Country Project Innovation Award. Project leader: Iveta Zolotová, members: Pater Papcun, Tomáš Lojka, Marek Bundzel, Martin Miškuf, Jozef Mocnej, Anna Novická, Daniel Lorenčík, *Michal* Puheim, students
- *Microsoft Azure Research Award*: IoT Cloud Control – Smart Living and Smart

Manufacturing, project leader: Jozef Mocnej

- *Robot - Human Coexistence in the Education of the Internet of Things,* Foundation of Tatra banka – Quality of Education, No. 2015vs075. Project leader: *Ján* Vaščák, members: Rudolf Jakša, Jakub Hvizdoš, Michal Puheim, Jakub Szász, Adam Březina.
- *CASTLE - Comfortable and SmarT Living Expanded*: Tatrabanka – *Foundation* E-talent. Project leader: Peter Papcun, members: Iveta Zolotová, Jozef Mocnej, Martin Miškuf, Tomáš Lojka, students
- *Data collection and smart industry in the Internet of Things and cloud technology*, faculty research grant, project leader: Tomáš Lojka
- *Data mining for effective medical diagnostics*, faculty research grant, project leader: *František* Babič, members: Miroslava Muchová, Ladislav Nyulászi, Michal Vadovský, Vladimír Gašpar

6 CO-OPERATION

6.1. Co-operation in Slovakia

- Department of Automatic Control Systems Bratislava, Slovak University of Technology, Bratislava
- Institute of Intelligent Systems, Faculty of Informatics, Slovak University of Technology, Bratislava
- Faculty of Informatics and Information Technologies, Slovak University of Technology in Bratislava
- Institute of Computer Science, Slovak Academy of Sciences in Bratislava
- Department of Biophysics IEP Slovak Academy of Science
- Institute of Computer Science, University of P.J. Šafárik, Košice
- Institute of Experimental Physics, Slovak Academy of Sciences
- Department of applied informatics (Centre for Cognitive Science), Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava
- Department of Control and Information Systems, Faculty of Electrical Engineering, University of Zilina
- IT Valley Košice
- US Steel Košice
- Microsoft Slovakia
- IBM Slovakia
- Control Systems Slovakia
- Betamont Slovakia

6.2. International Co-operation

- Department of Software Engineering and Interactive Systems, Vienna University of Technology, Austria
- Dept. for Technical & Operational Information Systems (Data & Knowledge Engineering Group), Otto-von-Guericke-University Magdeburg, Germany
- University of Regensburg, Germany
- University of Dortmund, Germany
- Waseda University, Tokyo, Japan
- Technical University of Czestochowa
- Tokyo Institute of Technology, Japan
- Kuyshu Institute of Technology, Japan

- University Pablo de Olavide of Seville, Spain
- Université Joseph Fourier Grenoble, IUT 1 (Institut Universitaire de Technologie 1), Grenoble, France
- Heudiasyc UMR CNRS 6599, UTC, Compiegne, France
- Université Henri Poincaré, Laboratoire CRAN (Centre de Recherche en Automatique de Nancy), Nancy 1, France
- Department of Informatics, Technical University Ostrava, Czech Republic
- Department of Control Systems and Instrumentation, Faculty of Mechanical Engineering Technical University Ostrava, Czech Republic
- Department of Cybernetics and Biomedical Engineering, Technical University Ostrava, Czech Republic
- Department of Cybernetics, Czech Technical University Prague, Czech Republic
- Department of Control Engineering, Czech Technical University, Prague, Czech Republic
- Institute of Information Theory and Automation, Academy of Sciences of Czech Republic, Prague, Czech Republic
- Department of Information Engineering, Faculty of Economics and Management, Czech University of Agriculture, Prague, Czech Republic
- University of Hradec Králové, Czech Republic
- Dept. of Computer Science and Engineering, Faculty of Applied Sciences, University of West Bohemia, Plzeň
- Faculty of Mechanical Engineering, Department of Automation, Institute of Information, University of Miskolc, Hungary
- Óbuda University, Budapest, Hungary
- Budapest University of Technology and Economics, Hungary
- Hungarian Academy of Sciences, Computer and Automation Research Institute, Hungary
- Regional Association of the Hungarian Academy of Sciences, Miskolc, Hungary

6.3. Membership in International Organizations and Societies

- Jakša, R.: IEEE, Computational Intelligence Society
- Krokavec, D.: Member of the International Federation of Automatic Control IFAC Technical Committee TC 1.4 Stochastic Systems
- IEEE Student Branch – Lojka, Miškuf, Hvizdoš, Mocnej, Ferenčík, Kajáti
- Ocelíková, E.; Sinčák, P.; Zolotová, I.: CPRS Czech Pattern Recognition Society
- Ocelíková, E.: CSSS Czech and Slovak Society for Simulation
- Machová, K.: ACM – Association of Computer Machinery
- Paralič, J.: ACM – Association for Computing Machinery, IEEE
- Sabol, T.: Information Society Technologies Program Committee (IST PC), 5th Framework Program, Brussels
- Sarnovský, J.: IEEE
- Sarnovský, J.: INES International Network of Engineers and Scientists for Global Responsibility
- Sarnovský, J.: Principia Cybernetica Web PRNCYB-L
- Sarnovský, J.: SWIIS Suplementary Ways for Improving International Stability
- Sinčák P.: European Society of Neural Networks
- Sinčák P.: IEEE, Computational Intelligence Society
- Vaščák, J.: IEEE, Computational Intelligence Society
- Zolotová, I.: IEEE, IEEE Communication Society, IEEE Computer Society
- Zolotová, I.: EAEEIE – European Association for Education in Electrical and

Information Engineering

6.4. Membership in Slovak Organizations and Societies

- The whole Department of Cybernetics and Artificial Intelligence is a team member of:
  - Slovak Society for Cybernetics and Informatics
  - Slovak AI Society
- Filasová, A.: Slovak Society for Cybernetics and Informatics
- Krokavec, D.: Slovak Electrical Engineering Society
- Jadlovská, A; Ocelíková, E.; Sarnovský, J.: Slovak Society for Cybernetics and Informatics
- Paralič, J.: Slovak Society for Computer Science
- Sabol, T.: Board of the Open Society Fund, Bratislava

6.5. International Networks and Exchange Programs

- SALEIE, Strategic Alignment of Electrical and Information Engineering in European Higher Education Institutions, Reference number: 527877-LLP-1-2012-1-UK-ERASMUS-ENW. Contact person: Iveta Zolotová
- OI-Net, European Academic Network for Open Innovation, Reference number: 542203-LLP-1-2013-1-FI-ERASMUS-ENW- Iveta Zolotová
- Erasmus+ programme Inter-institutional agreement 2014-2021 between TU of Košice and TECHNOLOGIKO EKPAIDEFTIKO IDRYMA-PIREA, T.E.I. Pirea, Greece, contact person: Iveta Zolotová
- Erasmus+ programme agreement between TU of Košice and University of Wellington New Zealand, contact person: Iveta Zolotová
- Socrates Erasmus agreement between TU of Košice and Czech University of Life Sciences, Prague, Czech Republic. Contact person: Eva Ocelíková
- Socrates Erasmus agreement between TU of Košice and Université Henri Poincaré, Nancy 1, France, Contact person: Ján Sarnovský
- Socrates Erasmus agreement between TU of Košice and University Pablo de Olavide, Sevilla, Spain. Contact person: Ján Vaščák
- Socrates Erasmus agreement between TU of Košice and University Hradec Kralove, Czech Republic. Contact person: Ján Vaščák

6.6. Visitors to the Department

- Kaori Yoshida, Kyushu Institute of Technology, Japan
- Filippo Cavallo, Scuola Superiore Sant Anna, Italy
- Ruzena Bajcsy, UC Berkeley, USA
- Petr Šaloun, VŠB - Technical University of Ostrava, Czech Republic
- Antonín Víteček, VŠB - Technical University of Ostrava, Czech Republic

6.7. Visits of Staff Members to Foreign Institutions

- J. Jadlovský, Switzerland, 11.-17.01.2016
- M. Varga, M. Vošček, Switzerland, 11.01.-01.02.2016
- M. Virčíková, Spain, 27.-31.1.2016
- P. Bednár, Netherlands, 24.-27.02.2016
- P. Butka, France, 22.-24.02.2016
- D. Krokavec, A. Filasová, Malta, 05.-09.04.2016
- K. Machová, M. Szaboová, Hungary, 02.05.2016

- J. Jadlovský, M. Oravec, Switzerland, 30.05-07.06.2016
- T. Cádrik, Czech Republic, 07.-10.06.2016
- E. Ocelíková, Czech Republic, 01.-30.06.2016
- P. Sinčák, Hungary, 17.-18.06.2016
- M. Kopčík, M. Varga, Switzerland, 14.06-04.07.2016
- P. Butka, Germany, 23.06-08.07.2016
- T. Lojka, Austria, 03.07-31.08.2016
- D. Krokavec, Spain, 03.-09.07.2016
- M. Čertický, Austria, 17.-20.07.2016
- M. Sarnovský, M. Smatana, M. Vadovský, Spain, 17.-23.07.2016
- P. Sinčák, Czech Republic, 04.-05.08.2016
- J. Mocnej, Germany, 16.-22.08.2016
- M. Miškuf, China, 11.-28.08.2016
- P. Papcun, Mallorca, 17.-25.08.2016
- P. Sinčák, Japan, 18.08-03.09.2016
- P. Takáč, Japan, 24.08-04.09.2016
- P. Sabol, Japan, 23.08-04.09.2016
- M. Miškuf, Brasil, 01.-12.09.2016
- P. Sinčák, J. Jadlovský, A. Jadlovská, S. Jadlovská, J. Sarnovský, I. Zolotová, P. Papcun, M. Sarnovský, V. Gašpar, J. Vaščák, Czech Republic, 04.-09.09.2016
- J. Mocnej, M. Mikula, New Zealand, 05.09.2016-28.07.2017
- D. Krokavec, A. Filasová, Spain, 06.-10.09.2016
- P. Butka, Romania, 07-09.09.2016
- J. Vaščák, Czech Republic, 08.-09.09.2016
- F. Babič, Gdansk, Poland, 11.-14.09.2016
- P. Bednár, M. Smatana, Czech Republic, 12.-16.09.2016
- P. Butka, F. Babič, Wroclaw, Poland, 14.-16.09.2016
- G. Magyar, Italy, 16.09-19.12.2016
- P. Butka, M. Sarnovský, F. Babič, Karpacz, Poland, 18.-20.09.2016
- P. Papcun, S. Jadlovská, D. Vošček, Czech Republic, 04.-07.10.2016
- P. Sinčák, M. Puheim, P. Takáč, P. Sabol, P. Takáč, P. Sabol, Budapest, Hungary, 09.-12.10.2016
- P. Bednár, Spain, 12.-15.10.2016
- D. Krokavec, France, 16.-19.11.2016
- F. Babič, Belgium, 24.-26.10.2016
- P. Sinčák, R. Andoga, L. Fozo, V. Gašpar, Hungary, 17.-18.11.2016
- J. Vaščák, I. Zolotová, Czech Republic, 08.-10.12.2016
- J. Jadlovský, Switzerland, 08.-09.12.2016

7 THESES

Thesis type	Bachelor	Master	Doctoral
Number	70	91	6

8 OTHER ACTIVITIES

- SAMI 2016 (IEEE 14th International Symposium on Applied Machine

Intelligence and Informatics) was held on January 21-23, 2016 in Herl'any, Slovakia: http://conf.uni-obuda.hu/sami2016/

9 PUBLICATIONS

9.1. Books

1. GAŠPAR, V. - OCELÍKOVÁ, E. - NYULÁSZI, L. - PUHEIM, M. - ANDOGA, R.: Rozhodovanie a zložitosť. 1st edition, Košice, Univerzitná knižnica TU, 2016, 215 p., ISBN 978-80-553-2523-1.
2. MACH, M.: Reprezentácia znalostí a riešenie úloh logické prístupy. 1st edition, Košice, Technická univerzita, 2016, 96 p., ISBN 978-80-553-2632-0.
3. MACHOVÁ, K.: Nové trendy v strojovom učení štatistický prístup. 1st edition, Košice, TU, 2016, 96 p., ISBN 978-80-553-2602-3.

9.2. Journals

1. BABIČ, F. LUKÁČOVÁ, A., PARALIČ, J.: Descriptive and predictive analyses of data representing aviation accidents. In: Advances in Intelligent Systems and Computing. Vol. 314 (2015), p. 181-190. ISSN 2194-5357
2. ABELEV, B. - ADAM, J. - ADAMOVA, D. - AGGARWAL, M.M. - AGNELLO, M. - ČERKALA, J. - JADLOVSKÁ, S. - KOPČÍK, M. - PAPCUN, P. - VAĽA, M.: Forward-central two-particle correlations in p-Pb collisions at ${s_{NN}}$ = 5.02 TeV. In: Physics Letters B. Vol. 753 (2016), p. 126-139. - ISSN 0370-2693.
3. ADAM, J. - ADAMOVÁ, D. - AGGARWAL, M. M. - AGLIERI RINELLA, G. - AGNELLO, M. - ČERKALA, J. - JADLOVSKÁ, S. - JADLOVSKÝ, J. - KOPČÍK, M. - PAPCUN, P. - VAĽA, M.: Azimuthal anisotropy of charged jet production in sNN=2.76 TeV Pb-Pb collisions. In: Physics Letters B. Vol. 753 (2016), p. 511-525, ISSN 0370-2693.
4. ADAM, J. - ADAMOVA, D. - AGGARWAL, M. M. - AGLIERI RINELLA, G. - AGNELLO, M. - ČERKALA, J. - JADLOVSKÁ, S. - JADLOVSKÝ, J. - KOPČÍK, M. - PAPCUN, P. - VAĽA, M.: Pseudorapidity and transverse-momentum distributions of charged particles in proton–proton collisions at √s=13TeV. In: Physics Letters B. Vol. 753 (2016), p. 319-329. - ISSN 0370-2693.
5. ADAM, J. - ADAMOVÁ, D. - AGGARWAL, M. M. - AGLIERI RINELLA, G. - AGNELLO, M. - ČERKALA, J. - JADLOVSKÁ, S. - KOPČÍK, M. - PAPCUN, P. - VAĽA, M.: Elliptic flow of muons from heavy-flavour hadron decays at forward rapidity in Pb–Pb collisions at √sNN=2.76TeV. In: Physics Letters B. Vol. 753 (2016), p. 41-56, ISSN 0370-2693.
6. ADAM, J. - ADAMOVA, D. - AGGARWAL, M.M. - AGLIERI RINELLA, G. - AGNELLO, M. - ČERKALA, J. - JADLOVSKÁ, S. - JADLOVSKÝ, J. - KOPČÍK, M. - PAPCUN, P. - VAĽA, M.: Measurement of electrons from heavy-flavour hadron decays in p–Pb collisions at ?sNN=5.02 TeV. In: Physics Letters B. Vol. 754, (2016), p. 81-93. - ISSN 0370-2693.
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9.3. Other publications

Publication Type	Confereces		Other
	Foreign	Home	
Number	14	54	25

DEPARTMENT OF ELECTRICAL ENGINEERING AND MECHATRONICS

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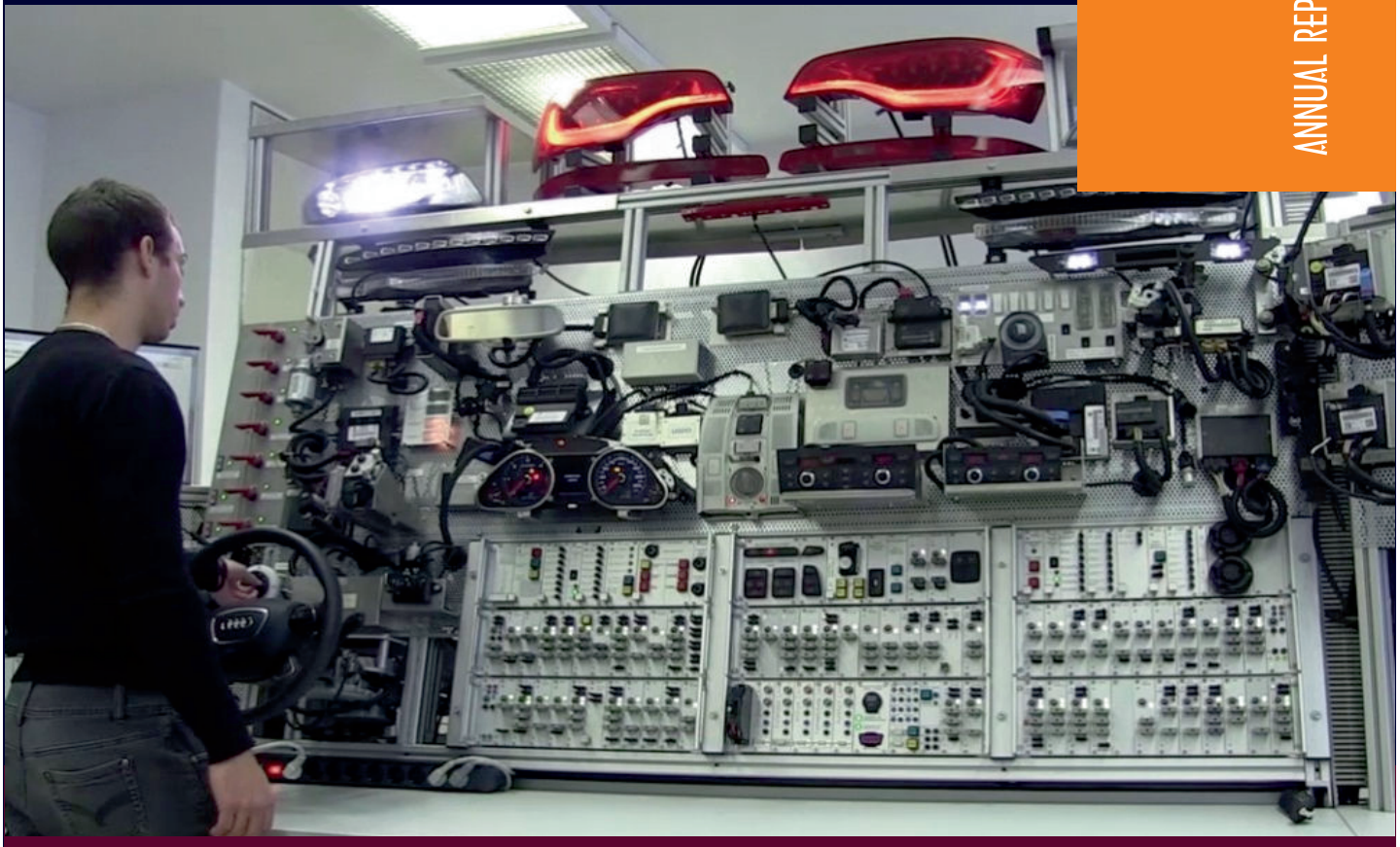
ANNUAL REPORT 2016



The Department was established at foundation of the Faculty of Electrical Engineering in 1969 as the Department of Electrical Drives but originally it was derived from the Department of Electrical Egineering established at foundation of the Technical University of Kosice (1953). Through the years the name of the department was changed in order to express closier its activities and development.
Staff members of the department are experienced in wide areas of electrical engineering, incl. automotive electrical engineering, mechatronics, and robotics what they utilise in teaching and research. Currently, the department is responsible for education and research in systems of electrical engineering, namely in fields of power and industrial electronics, electrical machines and apparatuses, sensors, electromechanical systems, controlled drives, multi-motor drives, control systems, industrial and automotive mechatronic systems up to drives of robots.
The Department offers all types of university courses: bachelor, master and Ph.D. courses.

2 STAFF

Professors:	prof. Ing. Jaroslav Dudrik, PhD. prof. Ing. Pavol Fedor, PhD. prof. Ing. Daniela Perduková, PhD. prof. Ing. Pavel Záskalický, PhD.
Associate Professors:	doc. Ing. František Ďurovský, PhD. doc. Ing. Viliam Fedák, PhD. doc. Ing. Želmíra Ferková, PhD. doc. Ing. Michal Girman, PhD. doc. Ing. Jaroslava Žilková, PhD.
Assistant Professors:	Ing. Ján Bačík, PhD. (since July 2016) Ing. Peter Bober, PhD. Ing. Peter Girovský, PhD. Ing. Ján Kaňuch, PhD. Ing. Karol Kyslan, PhD. Ing. Milan Lacko, PhD. Ing. Marek Pástor, PhD.
Senior Scientists:	Ing. Peter Hajsák Ing. Viktor Šlapák, PhD. (since July 2016)
Technical Staff:	Ing. Gabriela Brečková Zuzana Olexová doc. Ing.Michal Kostelný, CSc. prof. Ing. Jaroslav Timko, CSc.
Ph.D. Students:	Ing. Ján Bačík (till June 2016) Ing. Milan Biroš Ing. Godem Ali M. Ismeal (till June 2016) Ing. Martin Lešo Ing. Radoslav Sivý (till June 2016) Ing. Ľuboš Suchý Ing. Viktor Šlapák (till June 2016) Ing. Peter Talian Ing. Marek Vacek (till June 2016) Ing. Róbert Üveges Ing. Róbert Žatkovič

3 LABORATORIES

- Laboratory of Electrical Engineering
- Power Electronics Laboratory
- Laboratory for CAD (COSMOS, ProEngineer, MATLAB, PSpice, and applied SW, ABBRobotStudio)
- Laboratory of Industrial Automation
- Laboratory of Electrical Machines
- Laboratory of Electrical Drives
- Laboratory of Controlled Electrical Drives and Mechatronics
- Laboratory of Automotive Mechatronics
- Laboratory of Pneumatic and Hydraulic Systems
- Virtual Laboratory of Technological Processes Control by Programmable Logic. www.virtual.laboratory.kempi.fei.tuke.sk
- Virtual Laboratory of Mechatronic Systems Control: http://andromeda.fei.tuke.sk

4 TEACHING

4.1. Undergraduate Study (Bc.)

a) Bc. study programme in Automated Electrical Systems

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Fundamentals of Electrical Engineering	1st	2/2	Kaňuch
Computer Applications	3th	2/2	Perduková
Electrical Machines	3rd	2/2	Záskalický
Electrotechnics in Vehicles	3th	2/2	Ďurovský
Industrial Electronics	3th	2/2	Záskalický
Electrical Drives	4th	2/2	Žilková
Microprocessor Technique	3rd	2/2	Lacko
CAD Programs in Electrical Engineering	4th	2/2	Fedák
Power Electronics	4th	3/3	Dudrik
Sensors and Measurement of Nonelectrical Variables	4th	2/2	Girovský
Industrial Control Systems	4th	2/2	Fedor
Bachelor Thesis I.	5th	0/8	Supervisor
Simulation of Production Systems	5th	2/2	Bober
Controlled Electrical Drives	5th	2/2	Ďurovský
ManMachine Interface	5th	2/2	Peduková
Bachelor Project	5th	0/8	Supervisor
Bachelor Thesis II.	6th	0/8	Supervisor
Modeling of Electromechanical Systems	6th	2/2	Fedák
Projecting of Electrical Systems	6th	2/2	Ferková
Pneumatic and Hydraulics Drives	6th	2/2	Bober

4.2. Graduate Study (Ing.)

a) Ing. study programme in Electrical systems

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Power Semiconductor Systems	7th	2/2	Dudrik
Non-linear Electro-Mechanical Systems	7th	2/2	Fedor
Servosystems	7th	2/2	Ďurovský

Dynamic Phenomena of Electrical Machines	7th	2/2	Záskalický
Electrical Machines for Automation	7th	2/2	Ferková
Technology of Production in Electronics	7th	2/2	Slosarčík
Vehicle Mechatronics	8th	2/2	Ďurovský
Construction and Design of Converters	8th	2/2	Dudrik
Control of Assembly Lines with Programming Controllers	8th	2/2	Fedor
Statistical Process Control	8th	2/2	Bober
Diploma Project	8th	0/4	Supervisor
Robotics	8th	2/2	Žilková
Diploma Project II	9th	0/6	Supervisor
Mechatronic Production Systems	9th	2/2	Ďurovský
Intelligent Control in El Systems	9th	2/2	Žilková
Three-Dimensional Modelling and Simulation	9th	2/2	Ferková
Signal Processors	9th	2/3	Lacko
Technology of Production in Electrotechnics	9th	2/2	Girman
Diploma Thesis	10th	0/18	Supervisor

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

All subjects listed above are offered in English language for foreign students.

4.4. Ph.D Postgraduate Course on Electrical systems

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Power Electronics	1st	2/0	Dudrik
Ph.D. Project I	1st	0/2	Supervisor
Foreign Language I	1st	2/0	Dept. of Foreign Languages
Servosystems	2nd	2/0	Fedor
Ph.D. Project II	2nd	0/2	Supervisor
Foreign Language II	2nd	2/0	Dept. of Foreign Languages
Ph.D. Project III	3rd	0/4	Supervisor
Subject of Specialization	3rd	2/0	According to the subject
Scientific Activity	3rd	0/8	Supervisor
Ph.D. Project IV	4th	0/2	Supervisor
Scientific Activity	4th	0/8	Supervisor
Ph.D. Project IV	5th	0/2	Supervisor
Scientific Activity	5th	0/8	Supervisor
Ph.D. Thesis	5th	0/9	Supervisor

5 RESEARCH PROJECTS

- *Research of New Principles and Methods for Design of Electrotechnical Systems.* Project VEGA 1/0464/15 Scientific Grant Agency of the Ministry of Education, science, research and sport of the Slovak Republic and the Slovak Academy of Sciences. Principal investigator: DUDRIK, J. (2015-2018).
- *Electrical Drive with Highfrequency 2-phase Induction Motor.* Project VEGA 2/0192/15. Scientific Grant Agency of the Ministry of Education, science,

research and sport of the Slovak Republic and the Slovak Academy of Sciences. Principal investigator: ZASKALICKÝ, P. (2015-2018)

- *Modular power converter for compact actuators with high precision gears*. Project supported by the Slovak Research and Development Agency under the contract No. APVV-15-0750. Principal investigator: ĎUROVSKÝ, F. (2016-2020).
- *Mains Charger for Electrical vehicle batteries.* Grant FEI TUKE. Principal investigator: PÁSTOR, M. (2016)

6 CO-OPERATION

6.1. Co-operation in Slovakia

The Department co-operates with many industrial enterprises in Slovakia having joint projects at modernising of the electrical drive systems, control and mechatronic applications: U.S.STEEL Košice, SIEMENS, ABB, BSH Drives and Pumps Michalovce, BWG Prešov, Křižík Prešov, Schneider Electric Slovakia, Spell Procont Prešov, Spinea Prešov, Vonsch Brezno, Kybernetika Košice, TEKO Košice, ENERGO CONTROL Košice, ZŤS VVU Košice, ŽP Podbrezová, Bukóza Hencovce, Genesis Prešov, Embraco Slovakia Spišská Nová Ves, Kopex Košice, Slovak Union for Quality, Innovation and Design Q-IMPULZ, Košice, SEZ Krompachy, DATAKON Košice, SLOVRES Košice, STATON Turany, CAG Český Brod (ČR).

6.2. International Co-operation

- University of Zagreb, Croatia
- Brno University of Technology, Czech Republic
- Technical University of Liberec, Czech Republic
- VŠB -Technical University of Ostrava, Czech Republic
- West Bohemian University, Pilsen, Czech Republic
- University of Technology and Economy, Budapest, Hungary
- University of Miskolc, Hungary
- Delft University of Technology, The Netherlands
- Czech Academy of Science, Prague.
- Silesian Polytechnic Institute of Gliwice
- University of Oradea, Romania
- University of Maribor, Slovenia
- University of Zagreb, Croatia

6.2.1. Visits of Staff Members to Foreign Institutions

- BAČÍK, J., UVEGES, R.: TRADR Summer School 2016 on Heterogeneity in Robotics Systems, University of Oulu – Oulu (Finland), 22-26 August 2016.
- BAČÍK, J., TALIAN, P.: Ampér 2016, Brno (ČR), 22-25 March 2016.
- DUDRIK, J., FEDÁK, V., FERKOVÁ, Ž., PÁSTOR, M., SUCHÝ, Ľ., ŽATKOVIČ, R.: PEMC 2016, Varna, Bulgaria, 25-30 September 2016.
- Ferková Ž., SPEEDAM 2016, Capri (IT), June 2016.
- FERKOVÁ, Ž., PÁSTOR, M., ŠLAPÁK, V.: ELECTRONICS 2016, Palanga, Lithuania, 13-15 June 2016.
- FERKOVÁ, Ž.: TechSoft Engineering Praha, August 2016
- FERKOVÁ, Ž.: VUT Brno (CZ), October 2016.
- FERKOVÁ, Ž.: Technical Universtity of Liberec (CZ), December 2016.

- FERKOVÁ, Ž.: ČVUT Praha, General meeting of Czechoslovakia section IEEE (CZ), December 2016.
- KAŇUCH, J.: VUT Brno (ČR), 5-7 September 2016.
- ZÁSKALICKÝ, P., KAŇUCH, J.:KOMEL Katowice, Rytro (PL), 18-20 May 2016
- TALIAN, P., BAČÍK, J: B&R Corporate, Welcome in B&R Automation Academy, Eggelsberg, (AT), 27-29 January 2016.

6.3. Membership in International Organizations, Societies and Committees

- FEDÁK, V.: Vicechairman of the PEMC Council (Power Electronics and Motion Control) with the headquarters in Budapest.
- DUDRIK, J; FERKOVÁ, Ž, KYSLAN, K, PÁSTOR, M: IEEE members.
- FEDÁK, V.: IEEE ICETA 2016, Starý Smokovec. Program Chairman.
- PERDUKOVÁ, D.; ŽILKOVÁ, J.: members of Programme Committee: 11th International Conference on Soft Computing Models in Industrial and Environmental Applications – SOCO 2017, San Sebastian, Spain, October, 2016.

6.4. Membership in Slovak Professional Bodies

- FEDÁK, V.; KAŇUCH, J.; TIMKO, J.; ZÁSKALICKÝ, P.; FEDOR, P.; FERKOVÁ, Ž.; GIROVSKÝ, P.; HAJSÁK, P.; LACKO, M.; PERDUKOVÁ, D.: members of The SES (Slovak Electrotechnical Society), Branch at FEI TU Košice.
- FERKOVÁ, Ž.: member of Technical Standards Commission on Electrical Machines in SR.
- PERDUKOVÁ, D.: member of Accreditation Commission working group for research in Electrical and Power Engineering.
- PERDUKOVÁ, D.: Council of the Secondary Technical School for EE, Košice (delegate of the FEI TU Košice).
- KOVÁČOVÁ, I., (chairman), DUDRIK, J., GIRMAN, M., PERDUKOVÁ, D., ZÁSKALICKÝ, P.: members of board for the PhD. Study in Electrical Systems at FEI TU Košice.

6.5. National Educational Projects

- *E-MLAB a set of original laboratory workstations to support and extend research and teaching laboratories in the field of Mechatronics*. KEGA 011TUKE-4/2013. Coordinator: PERDUKOVÁ, D.

6.6. Editorial Boards

- BOBER, P. Editorial board of journal “Quality, Innovation, Prosperity” (Kvalita, Inovácia, Prosperita), ISSN 1335-1745 (print), ISSN 1338-984X (online).
- DUDRIK, J. – Member of the Series Editorial Board of Annals of the Academy of Romanian Scientists.
- DUDRIK, J.: Editorial board of Transactions on electrical engineering, Czech Republic, ISSN 1805-3386.
- DUDRIK, J.: International Editorial Board of Power Electronics and Drives, Wroclaw, Poland, ISSN: 2451-0262, eISSN: 2543-4292.
- FEDÁK, V.: Editorial board of the Journal on Power Electronics and Drives Wroclaw University of Technology), ISSN 0033-2097.
- FEDÁK, V.: Editorial board of the Journal “Przeglad Elektrotechniczny” (Polish Academy of Sciences, Warsszaw), ISSN 0033-2097, e-ISSN 2449-9544.
- FEDOR, P: Editorial board of Acta Electrotechnica et Informatica – AEI. Journal

of the Faculty of Electrical Engineering and Informatics. ISSN 1335-8243.
- PERDUKOVÁ, D.: Editorial board of Elektroenergetika journal, ISSN 1337-6756.
- PERDUKOVÁ, D.; FEDÁK, V.; DUDRIK, J.; ĎUROVSKÝ, F.; FEDOR, P.; GIROVSKÝ, P.; LACKO, M.; KYSLAN, K.; PÁSTOR, M.: Editorial board of Elektrotechnické listy, ISSN 2453-8981
- ZÁSKALICKÝ, P.: Editorial board of Acta Technica CSAV. Journal of Czech Academy of Sience, Praque. Czech Republic. ISSN 0001-7043.
- ZÁSKALICKÝ, P.: Editorial board of KOMEL, Branzowy osrodek badavczo-rozwojovy Maszyn elektrycznych, Katowice, Poland. ISSN 0239-3646.

7 THESES

7.1. Doctoral Theses

- BAČIK, J.: Models of Drones as a non-linear Mechatronic Systems. Supervisor: Fedor, P.
- GODEM Ali M. Ismeal: System Identification and Controller Optimization Using Soft Computing Methods. Supervisor: Fedák, V.
- SIVÝ, R.: Methods of localisation and mapping based on intelligent sensor systems. Supervisor: Perduková, D.
- ŠLAPÁK, V.: Advanced methods of Servodrives Control. Supervisor: Ďurovský, F.

Thesis type	Bachelor	Master	Doctoral
Number	8	28	4

8 OTHER ACTIVITIES

8.1. Symposia, Workshops, Conferences

- SYMEP 2016 – International Symposium of Electrical Drives Teachers. Herľany, 22-24 June 2016.

8.2. Projects for Industry

- Control of Rotary Knife. For Datakon Košice, 2016. Co-ordinator: Ďurovský, F.
- Technical co-operation at determination the accident cause of main mill drive motors at Hot Roll Mill Stand TŠP 1700 in Hot Roll Mill Division U.S. Steel Košice. Co-ordinator: Ferková, Ž.
- Calculation of magnetic field of ARC cathode. For STATON , s.r.o. Turany. Co-ordinator: Ferková, Ž.

8.3. Student Competitions and Rewards

- BAČÍK Ján: SCYR 2016 – (17 May 2016) FPT Slovakia Award.
- MOLNÁR Tomáš: MATLAB and Simulink Hardware Challenge 2016 – Praise from HUMUSOFT company for participation and presentation of project on international competition of MathWorks company.
- ŠLAPÁK Viktor: SCYR 2016 (17 May 2016) – Award of ELFA s.r.o. company for the EEE section “4th year PhD students“.
- ÜVEGES Róbert: SCYR 2016 (17 May 2016) - 1st place (Dean’s Award) in EEE section 1st year.

- ŽATKOVIČ Róbert: SCYR 2016 (17 May 2016) – Award of ELFA s.r.o. company for the EEE section "2nd year PhD students".

8.4. Compositions for Dissertation Examinations

- BIROŠ, M.: Power management in mobile systems. Supervisor: Ďurovský, F.

9 PUBLICATIONS

9.1. Books

1. VACEK, M. - ŽILKOVÁ, J. - LEŠO, M.: Optický bezpečnostný systém robotického pracoviska. 1. Vyd. Košice, TU 2016. 95 p. ISBN 978-80-553-2611-5.
2. FEDÁK V., ZÁSKALICKÝ P.: Support for Learning of Dynamic Performance of Electrical Rotating Machines by Virtual Models. Chapter in the book "E-Learning - Instructional Design, Organizational Strategy and Management", editor Boykja Gradinarova, INTECH Croatia, 2016, pp. 3-31. ISBN 978-953-51-2188-6.

9.2. Textbooks

1. FEDOR, P. - PERDUKOVÁ, D.: Priemyselná automatizácia. 1.vyd. Košice, TU 2016. 103 p. ISBN 978-80-553-2477-7.
2. ĎUROVSKÝ, F. - KAŇUCH, J.: Elektrické zariadenia v automobiloch 1. 1. vyd. Košice, Technická univerzita 2016. 73 p. ISBN 978-80-553-2620-7.
3. ĎUROVSKÝ, F. - KAŇUCH, J.: Elektrické zariadenia v automobiloch 2. 1. vyd. Košice, Technická univerzita 2016. 85 p. ISBN 978-80-553-2622-1.
4. KYSLAN, K. - ĎUROVSKÝ, F.: Regulované pohony - Návody na cvičenia. 1.vyd. Košice, Technická univerzita 2016. 68 p. ISBN 978-80-553-2627-6.
5. LACKO, M.: Mikroprocesorová technika návody na cvičenia a riešené príklady. 1.vyd. Košice, Technická univerzita 2016. 65 p. ISBN 978-80-553-2626-9.
6. PÁSTOR, M. - DUDRIK, J. - ŽATKOVIČ, R.: Výkonová elektronika 1 zbierka riešených príkladov a návody na cvičenia. 1.vyd. Košice,:TU 2016. 115 p. ISBN 978-80-553-2596-5.
7. PERDUKOVÁ, D.: Autivo – fyzikálny model autonómneho vozidla. 1.vyd. Košice, TU 2016. 64 p. ISBN 978-80-553-2589-7.
8. ZÁSKALICKÝ, P. - KAŇUCH, J.: Návody na cvičenia z Elektrických strojov. 1.vyd. Košice, TU 2016. 64 p. ISBN 978-80-553-2579-8.

9.3. Scientific Journals

Journals indexed in Thomson Reuters "Current Contents" list

1. FEDORKO, G. - MOLNÁR, V. - FERKOVÁ, Ž. - PETERKA, P. - KREŠÁK, J. - TOMAŠKOVÁ, M.: Possibilities of failure analysis for steel cord conveyor belts using knowledge obtained from non-destructive testing of steel ropes. 2016. In: Engineering Failure Analysis. Vol. 67 (2016), pp. 33-45. ISSN 1350-6307.
2. ŠLAPÁK, V. - KYSLAN, K. - LACKO, M. - FEDÁK, V. - ĎUROVSKÝ, F.: Finite control set model predictive speed control of a DC motor. 2016. In: Mathematical Problems in Engineering. Vol. 2016, no. ID 9571972 (2016), pp. 1-10. ISSN

1024-123X.

Foreign Journals

1. ANANTHAVEL, S. - PADMANABAN, S. - SHANMUGHAM, S. - BLAABJERG, F. - ERTAS, A. H. - FEDÁK, V.: Analysis of enhancement in available power transfer capacity by STATCOM integrated SMES by numerical simulation studies. 2016. In: Engineering Science and Technology, an International Journal. Vol. 19, no. 2 (2016), pp. 671-675. ISSN 2215-0986.
2. FERKOVÁ, Ž.: Influence of the arrangement and sizes of magnets on the cogging torque of PMSM. 2015. In: Technical Transactions: Electrical Engineering. Vol. 112, no. 1-E (8) (2015), pp. 161-171. ISSN 1897-6301.
3. KAŇUCH, J. - DUČAY, A.: Design and technical solution of a special motor with permanent magnets. 2016. In: Maszyny elektryczne: Zeszyty problemove. Vol. 109, no. 1 (2016), pp. 83-88. - ISSN 0239-3646.
4. PERDUKOVÁ, D. - BATMEND, M. - FEDOR, P.: Automated Headstone Photo Engraving. 2015. In: Applied Mechanics and Materials: Applied Mechanics and Mechatronics 2. Vol. 816 (2015), pp. 313-320. ISSN 1662-7482.
5. ZÁSKALICKÝ, P.: Study of current space phasor trajectory of the three-phase asynchronous motor with one phase open circuit fault. 2016. In: Maszyny elektryczne. Vol. 111, no. 3 (2016), pp. 147-151. ISSN 0239-3646.

Foreign Journals indexed in Web of Science or Scopus databases

1. FEDOR, P. - PERDUKOVÁ, D.: Model-Based Fuzzy Control Applied to a Real Nonlinear Mechanical System. 2016. In: Iranian Journal of Science and Technology, Transactions of Mechanical Engineering. Vol. 40, no. 2 (2016), pp. 113-124. ISSN 2228-6187.

National Journals indexed in Web of Science or Scopus databases

National Journals

1. BAČÍK, J. ml.: Triediaci mobilný robot - platforma pre súťaž Robot Challenge. 2016. In: Elektrotechnické listy. Roč. 1, č. 1 (2016), pp. 1-3. ISSN 2453-8981.
2. BOBER, P.: Meranie vplyvu uhlov komutácie na index účinnosti trojfázového BLDC motora. 2016. In: Posterus. Roč. 9, č. 8 (2016), pp. 1-7. ISSN 1338-0087. Spôsob prístupu: *http://www.posterus.sk/?p=18751*.
3. DUDRIK, J. - PÁSTOR, M. - LACKO, M. - ŽATKOVIČ, R.: ZVZCS PWM DC-DC converter with controlled secondary rectifier for arc welding. 2016. In: Acta Electrotechnica et Informatica. Roč. 16, č. 2 (2016), pp. 33-41. ISSN 1335-8243.
4. FERKOVÁ, Ž. - SUCHÝ, Ľ.: Vplyv uloženia PM na väzobné momenty medzi zubami statora a rotorom synchrónneho motora s PM. 2016. In: Strojárstvo. Roč. 20, č. 3 (2016), pp. 78-79. ISSN 1335-2938.
5. GIROVSKÝ, P. - FEKETE, J.: Udržiavanie rýchlosti pomocou tempomatu. 2016. In: Strojárstvo. Roč. 20, č. 4 (2016), pp. 102-104. ISSN 1335-2938.
6. GIROVSKÝ, P.: Riadenie synchrónneho motora s permanentnými magnetmi pomocou fuzzy regulátora. 2016. In: Elektrotechnické listy. Roč. 1, č. 1 (2016), pp. 1-4. ISSN 2453-8981.
7. GIROVSKÝ, P.: Ovládanie pohybu robotického ramena pomocou rukavice so snímačmi. 2016. In: Elektrotechnické listy. Roč. 1, č. 1 (2016), pp. 1-3. ISSN 2453-8981.

8. GIROVSKÝ, P.: Control of induction motor based on neural estimator. 2016. In: Acta Electrotechnica et Informatica. Roč. 16, č. 2(2016), pp. 29-32. ISSN 1335-8243.
9. GIROVSKÝ, P. - KOLLÁRIK, M.: Protišmykový systém vozidla s Fuzzy riadením. 2016. In: Elektrotechnické listy. Roč. 1, č. 2 (2016), pp. 1-3. ISSN 2453-8981. Spôsob prístupu: http://www.elektrotechnickelisty.eu/casopis/rocnik_I/clanky/EL_17_2016.pdf.
10. KAŇUCH, J.: Nové trendy a smery vo vývoji akumulátorov pre elektromobily. 2016. In: Posterus.sk. Roč. 9, č. 3 (2016), pp. 1-14. ISSN 1338-0087. Spôsob prístupu: http://www.posterus.sk/?p=18414.
11. KAŇUCH, J. - DUČAY, A.: Konštrukčné riešenie špeciálneho motora s permanentnými magnetmi. 2016. In: Elektrotechnické listy. Roč. 1, č.1 (2016), pp. 1-4. ISSN 2453-8981. Spôsob prístupu: http://www.elektrotechnickelisty.eu/casopis/rocnik_I/clanky/EL_05_2016.pdf.
12. KAŇUCH, J.: Elektromagnetická kompatibilita (EMC) univerzalného motora. 2016. In: Elektrotechnické listy. Roč. 1, č. 2 (2016), pp. 1-6. ISSN 2453-8981. Spôsob prístupu: http://www.elektrotechnickelisty.eu/casopis/rocnik_I/clanky/EL_14_2016.pdf.
13. KYSLAN, K. - ŠLAPÁK, V. - LACKO, M. - FEDÁK, V.: Prediktívne riadenie PMDC motora s konečným počtom akčných zásahov. 2016. In: ATP Journal. Roč. 23, č. 1 (2016), pp. 42-44. ISSN 1335-2237.
14. LACKO, M. - BAČÍK, J. ml.: Malý mobilný revízny robot pre nútené vetranie. 2016. In: Elektrotechnické listy. Roč. 1, č. 1 (2016), pp. 1-5. ISSN 2453-8981. Spôsob prístupu: http://www.elektrotechnickelisty.eu/casopis/rocnik_I/cislo_1_2016.html
15. LEŠO, M. - ŽILKOVÁ, J.: Pokročilá 3D vizualizácia v MATLAB-e. 2016. In: Posterus.sk. Roč. 9, č. 5 (2016), p. 10. ISSN 1338-0087. Spôsob prístupu: http://www.posterus.sk/?p=18583.
16. LEŠO, M. - ŽILKOVÁ, J.: Vizualizácia robotických ramien v MATLAB-e. 2016. In: Posterus.sk. Roč. 9, č. 6 (2016), pp. 1-10. ISSN 1338-0087. Spôsob prístupu: http://www.posterus.sk/?p=18645.
17. LEŠO, M. - ŽILKOVÁ, J. - PÁSTOR, M.: Štandardné metódy riadenia DC-DC meničov. 2016. In: Elektrotechnické listy. Roč. 1, č. 1 (2016), pp. 1-4. ISSN 2453-8981: Spôsob prístupu: http://elektrotechnickelisty.eu/casopis/rocnik_I/clanky/EL_07_2016.pdf.
18. MAGURA, D. - FEDÁK, V. - KYSLAN, K.: Jednoduchý regulátor polohy s prepínaním nelineárnych funkcií pre polohovanie konca pásu z navíjačky. 2016. In: Elektrotechnické listy. Roč. 1, č. 1 (2016), pp. 1-6. ISSN ISSN 2453-8981.
19. PÁSTOR, M. - LÉNÁRT, G.: Trojfázový striedač s LCL filtrom pripojený do siete. 2016. In: Elektrotechnické listy. Roč. 1, č. 1 (2016), pp. 1-4. ISSN 2453-8981. Spôsob prístupu: http://www.elektrotechnickelisty.eu/casopis/rocnik_I/clanky/EL_10_2016.pdf.
20. PERDUKOVÁ, D. - FEDOR, P.: Fuzzy prístup pre zostavenie modelu jednosmerného pohonu. 2016. In: Elektrotechnické listy. Roč. 1, č. 1 (2016), pp. 1-5. ISSN 2453-8981.
21. SMOLEŇ, P. - KYSLAN, K. - LACKO, M.: Riadenie servopohonov brúsnej veže. 2016. In: Posterus.sk. Roč. 9, č. 1 (2016), pp. 1-8. ISSN 1338-0087.
22. SUCHÝ, Ľ. - FERKOVÁ, Ž.: Simulácia elektrického pohonu so spínaným

reluktančným motorom. 2016. In: Strojárstvo. Roč. 20, č. 4 (2016), pp. 98-99. ISSN 1335-2938.

23. TALIAN, P. - PERDUKOVÁ, D. - FEDOR, P.: Koncepcia hardware-in-the-loop pracoviska na báze PLC pre verifikáciu riadenia DC motora. 2016. In: Elektrotechnické listy. 2016. Roč. 1, č. 1 (2016), pp. 1-4. ISSN 2453 – 8981. Spôsob prístupu: http://www.elektrotechnickelisty.eu/casopis/rocnik_I/clanky/EL_09_2016.pdf.
24. ŽATKOVIČ, R. - DUDRIK, J. - TRIP, D.: High Frequency Soft Switching PWM DCDC Converter with Secondary Side Active Rectifier. 2016. In: Acta Electrotechnica et Informatica. Roč. 16, č. 3 (2016), pp. 3-7. ISSN 1335-8243.
25. ŽILKOVÁ, J. - LEŠO, M. - PÁSTOR, M.: Identifikácia elektromagnetických parametrov jednosmerného motora. 2016. In: Strojárstvo. Roč. 20, č. 4 (2016), pp. 100-101. ISSN 1335-2938.
26. BIROŠ, M. - ĎUROVSKÝ, F.: Technológia palivových článkov v automobiloch. 2016. In: Elektrotechnické listy. Roč. 1, č. 2 (2016), pp. 1-6. ISSN 2453-8981. Spôsob prístupu: http://elektrotechnickelisty.eu/casopis/rocnik_I/clanky/EL_16_2016.pdf.

9.4. Other publications (papers in conference proceedings, etc.)

Publication Type	Confereces		Other
	Foreign	Home	
Number	4	21	16

DEPARTMENT OF ELECTRIC POWER ENGINEERING

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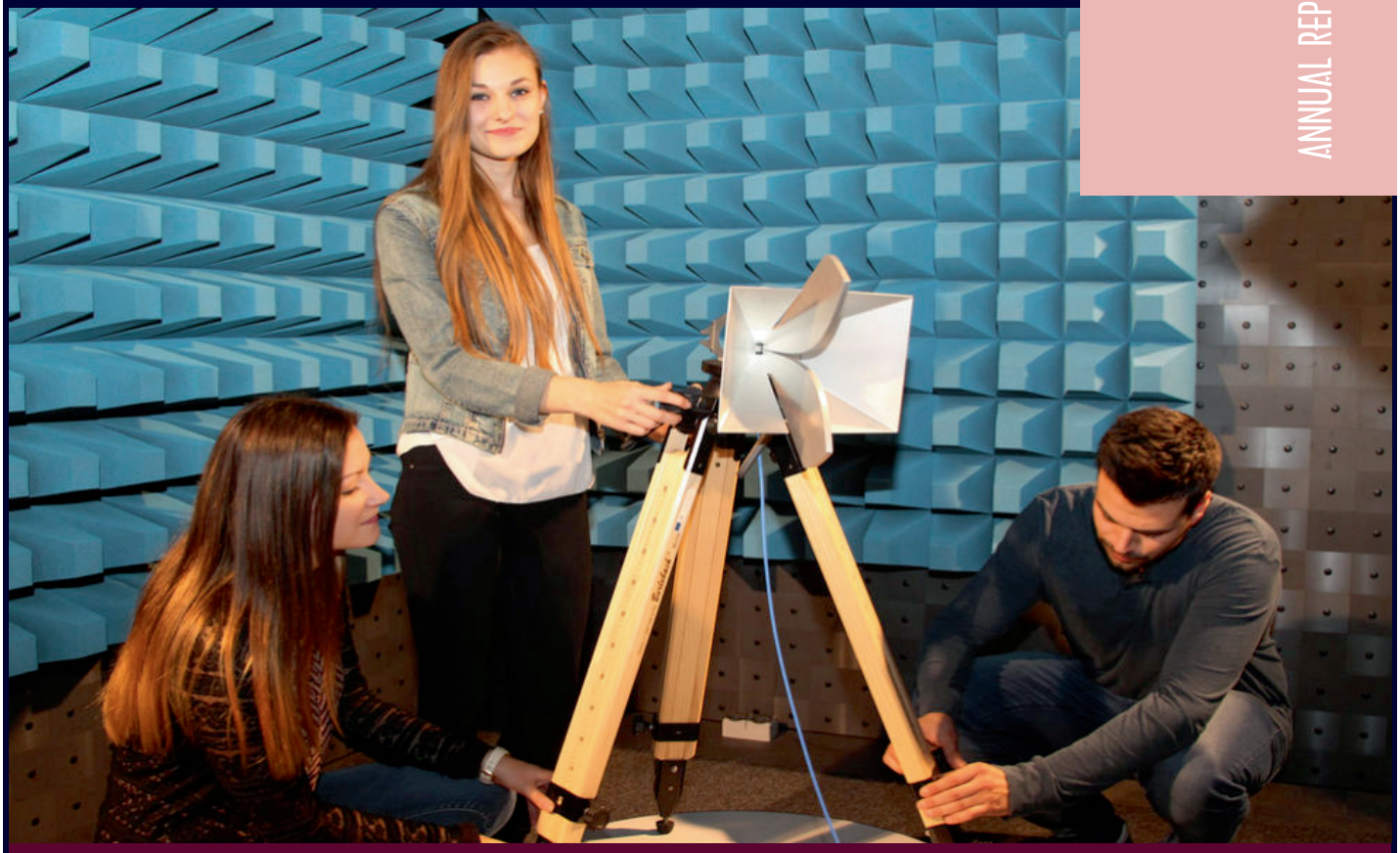
ANNUAL REPORT 2016



The Department of Electric Power Engineering at Technical University of Košice is one of the profiling departments of Faculty of Electrical Engineering and Informatics. It was founded on the 1st October 1973 as an independent science and research unit of the faculty. The most important structural changes of the department were:

- Integration of the department with the Department of Electrical Heating and Electrochemistry on the 1st September 1981
- Incorporation of the Department of High Voltage Engineering into the Department of Electric Power Engineering on the 1st October 2003

These structural changes influenced the department activities and staff changes. The Department of Electric Power Engineering currently has 3 professors, 3 associate professors, 9 assistant professors and 16 internal PhD. students.

According to the last accreditation, the Department of Electric Power Engineering guarantees these study programmes:

- Electric Power Engineering in bachelor, master and doctoral degree courses
- Electrical Engineering in bachelor degree course.

The department is responsible for education of fundamental subjects of the study programmes: Transmission and Distribution of Electricity, Electric Power Plants, Electric Power System Operation, Electric Installation and Substation, Diagnostics of Electrical Power Engineering Equipments, Unconventional Power Sources, Electro Heat and Lighting Engineering.

The department offers education of electrical engineers, self-employed electrical engineers and electrical engineers for activities supervision or operation supervision in the range for electrical devices without voltage constraint including lightning conductors for objects without detonation risk.

The department enhances and improves educational process also in cooperation with foreign universities through ERASMUS programmes.

The department staff has worked on several national and international grant projects, focused on:

- Control of Electric power system of Slovak Republic and electricity market in conditions of European Union
- Utilisation of artificial intelligence elements for electric power engineering control processes
- Electrical relays and electric power system stability
- Solving of overhead power lines mechanics in three dimensional space
- Illumination of spaces and lighting sources
- Solar devices with optimal efficiency and solar system properties
- Diagnostics of electric power equipment
- High-quality results of science and research activities of the department staff are ensured by the extensive cooperation with the electric power companies (SEPS, VSE, VSD, Siemens, ABB, ZSE, SSE, Landis+Gyr, Schneider Electric and many others).

The Department of Electric Power Engineering at FEI TU of Košice is the only department in Slovakia with accredited study programmes in all three degree levels of university studies.

2 STAFF

Professors:	prof. Ing. Roman Cimbala, Ph.D. Dr.h.c. prof. Ing. Michal Kolcun, Ph.D. prof. Ing. Iraida Kolcunová, Ph.D.
Associate Professors:	doc. Ing. Ľubomír Beňa, Ph.D. doc. Ing. Alexander Mészáros, Ph.D. doc. Ing. Juraj Kurimský, Ph.D.
Assistant Professors:	Ing. Jozef Balogh, Ph.D. (until 04.11.2016) Ing. Zsolt Čonka (since 1.2.2016) Dr. Ing. Bystrík Dolník Ing. Jaroslav Džmura, Ph.D. Ing. Stanislav Ilenin, Ph.D.

Ing. Martin Kanálik, Ph.D.
Ing. Dušan Medveď, Ph.D.
Ing. Marek Pavlík Ph.D.
Ing. Jaroslav Petráš, Ph.D.

Technical Staff: doc. Ing. Pavel Novák, CSc.
Dagmar Kramolišová
doc. Ing. Ladislav Varga, Ph.D.
Ing. Jana Varnavčinová

Ph.D. Students: Ing. Zsolt Čonka (until 31.1.2016)
Ing. Miroslav Kmec (until 30.6.2016)
Ing. Lukáš Lisoň (until 30.6.2016)
Ing. Miroslav Mikita
Ing. Samuel Bucko
Ing. Michal Kosterec
Ing. Martin Vojtek
Ing. Lukáš Kruželák
Ing. Daniel Kuchár (until 30.6.2016)
Ing. Michal Špes
Ing. Michal Ivančák (since 1.9.2016)

3 LABORATORIES

- Three PC Laboratories
- Laboratory of Electrical Relays
- Laboratory of Environmental Protection
- Laboratory of Electrical Power Network
- Laboratory of Unconventional Power Source
- Laboratory of Lighting Engineering
- Laboratory of High Voltage Engineering
- Laboratory of Diagnostics and Prophylactics
- Laboratory of Electrostatics
- Laboratory of Partial Discharges
- Laboratory of Intelligent Systems
- Electric Power Systems Control Laboratory, Joint Laboratory of Department of Electric Power Engineering TU FEI Košice and ABB ELEKTRO, Ltd., Bratislava
- Laboratory of Electro-magnetic Compatibility
- Laboratory of Photovoltaics
- Laboratory of Dielectric Spectroscopy
- Laboratory LAV6 – Measurements site of OZE

4 TEACHING

4.1 Undergraduate Study (Bc.)

Subject	Semester	Lectures/exercises (Hours per week)	Name of Lecturer
Fundamentals of Electrical Engineering	1st	2/2	Cimbala
Introduction to programming and networks	1st	0/2	Petráš

Subject	Semester	Lectures/exercises (Hours per week)	Name of Lecturer
Introduction to Engineering	1st	0/2	Kolcun
Fundamentals of environmental engineering	2nd	2/2	Mészáros
Programming	2nd	0/2	Petráš
Power transmission	3rd	2/2	Kanálik
Light - technology	3rd	2/2	Beňa
Designing in electric power engineering	3rd	2/2	Ilenin
Electric Power Plants	4th	2/2	Kolcun
Faults in Electric Power System	4th	2/2	Beňa
Database systems - SQL Oracle	4th	2/2	Petráš
Measurement in electric power engineering	4th	2/2	Kurimský
Conversion of Electrical Energy	4th	2/2	Medveď
Bachelor Project	5th	0/8	(Supervisors)
Electrical installation and substation	5th	2/3	Petráš
High Voltage Engineering	5th	2/3	Kolcunová
Software engineering environment	5th	2/2	Cimbala
Operation of electric power plants	5th	2/2	Džmura
Bachelor Thesis	6th	0/12	(Supervisors)
Electrical relaying in electric power system	6th	2/3	Čonka
Unconventional energy sources	6th	2/2	Pavlík
Prophylactics of power engineering equipment	6th	2/2	Kolcunová
Professional experience in an enterprise	6th	0/4	Džmura
Safety at work on electric devices	6th	2/2	Balogh

4.2 Graduate Study (Ing.)

Subject	Semester	Lectures/exercises (Hours per week)	Name of Lecturer
Automatization of Electric Power Plant Service	7th	2/2	Cimbala
Quality and reliability of electric power delivery	7th	2/2	Beňa Kanálik
Optimisation of Electric Power System Operation	7th	2/3	Kolcun
Simulation in Electric Power System	7th	2/3	Medveď
Overvoltages in Electric Networks	7th	2/2	Dolník
Thesis project 1	8th	0/4	(Supervisors)
Electric power system operation control	8th	2/3	Kolcun
Transient stability of power system	8th	2/2	Džmura
Electrical power network	8th	2/2	Varga
Design of the illuminating systems	8th	1/3	Beňa
Thesis project 2	9th	0/8	(Supervisors)
Diagnostic in electric power engineering	9th	2/2	Kolcunová
Protection Systems of Electric Power System	9th	2/2	Kurimský
Automated electrical installation systems	9th	2/2	Džmura
Electromagnetic compatibility	9th	3/1	Dolník
Master Thesis	10th	0/18	(Supervisors)

Subject	Semester	Lectures/exercises (Hours per week)	Name of Lecturer
Management of Electric Power Enterprises	10th	2/0	Cimbala

4.3 Postgraduate Study (PhD.)

Subject	Semester	Lectures/exercises (Hours per week)	Name of Lecturer
Theoretic electric power engineering (4)	1st	0/10	Cimbala Kolcun Kolcunová Meszáros Beňa Kurimský
Scientific Activity 1 (4)	1st	0/8	(Supervisors)
Electricity supply system analysis (4)	2nd	0/10	Cimbala Kolcun Kolcunová Mészáros Beňa Kurimský
Subject of specialised area (4)	3rd	0/10	Cimbala Kolcun Kolcunová Mészáros Beňa Kurimský
Scientific Activity 2 (4)	3rd	0/10	(Supervisors)
Scientific Activity 3 (4)	5th	0/10	(Supervisors)
Scientific Activity 4 (4)	6th	0/10	(Supervisors)
Scientific Activity 5 (4)	7th	0/10	(Supervisors)

5 RESEARCH PROJECTS

- Development of a system for continuous monitoring of pollution impact on the high-voltage insulation. Slovak Research and Development Agency (APVV) No. APVV-15-0438, duration: 2016 - 2020, co-ordinator: Kurimský, J.
- Interaction of magnetic fluids with electromagnetic field. Scientific grant agency project (S.G.A.) No. 2/0141/16, duration: 2016-2019, co-ordinator: Kurimský, J.
- Analysis of Influences of Degrading Factors on Electro - Physical Structure Changes of Progressive Electrical Engineering Insulation Materials. Scientific grant agency project (S.G.A.) No. 1/0311/15, duration: 2015-2018, co-ordinator: Cimbala, R.
- Research of the penetrating of high frequency electromagnetic waves through ecological building materials. Scientific grant agency project (S.G.A.) No. 1/0312/15, duration: 2015-2018, co-ordinator: Kolcunová, I.
- Smart electric installation as a tool for life quality enhancement for seniors and handicapped. Cultural and Educational Grant Agency project (KEGA) No. 002TUKE-4/2015, duration: 2015 - 2016, co-ordinator: Džmura, J.
- Impact of electromagnetic field on the properties of materials. Faculty of Electrical Enginnering Technical University of Košice (FEI TUKE.) No. FEI-2015-6, duration: 2016, co-ordinator: Pavlík, M.

6 CO-OPERATION

6.1 Co-operation in Slovakia

- Institute of Experimental Physics, Slovak Academy of Sciences, Košice
- Slovak Power Plants, Inc. (SE, a.s.), Bratislava
- Power Plant EVO, Vojany
- Power Plant ENO, Nováky
- Hydro Power Plants VET, Trenčín
- Nuclear Power Plant EBO, Jaslovské Bohunice
- Nuclear Power Plant EMO, Mochovce
- Heat and Power Plant TEKO, Košice
- Slovak Electric Transmission System, Inc. (SEPS, a.s.), Bratislava
- VSE – Eastern Slovakia Power Engineering, Inc., Košice
- SSE - Central Slovakia Power Engineering, Inc., Žilina
- ABB Ltd., Bratislava
- Research Institute of Nuclear Power Plants, Inc. (VUJE, a.s.), Trnava
- Slovak Gas Industry, Division Slovtransgaz, Nitra
- U.S. Steel, Košice
- Siemens Ltd., Bratislava
- Hasma, Ltd.,
- Schneider Electric Slovakia, Ltd.,
- ZSE - Western Slovakia Power Engineering, Inc.,
- SAG ELV Slovensko, Inc.,
- Landis +Gyr, Ltd.,

6.1.1. Visitors to the Department

- Dr. hab inz. Prof.PCz. Anna Gawlak – Czestochowa University of Technology, Poland
- Dr.Inz. Miroslaw Kornatka – Czestochowa University of Technology, Poland
- prof. Ing. Stanislav Rusek, CSc. – VŠB Technical University of Ostrava,, Czech Republic
- doc. Ing. Radomír Goňo, PhD. – VŠB Technical University of Ostrava,, Czech Republic
- Dr. Ing. Wieslawa Malska, Ph.D. – Rzeszow University of Technology, Poland
- Dr. Ing. Tomasz Binkowski, Ph.D. – Rzeszow University of Technology, Poland
- Ing. Michal Ptáček, PhD. – Brno University of Technology, Czech Republic
- Ing. Branislav Bátora, PhD. – Brno University of Technology, Czech Republic

6.2 International Co-operation

- Moscow Power Engineering Institute, Russia
- Sankt - Petersburg Power Education Institute of Power Engineering, State Department of Russian Federation, Russia
- Eurasian National University, Astana, Kazakhstan
- Graz University of Technology, Austria
- Czestochowa University of Technology, Poland
- Technical University of Riga, Latvia
- Technical University of Tallinn, Estonia
- COMTEST Ltd. Netherlands
- West Bohemian University, Pilsen, Czech Republic

- VŠB Technical University, Ostrava, Czech Republic
- Czech Technical University, Prague, Czech Republic
- Brno University of Technology, Czech Republic
- ÓBUDA University, Budapest, Hungary
- Technical University of Varna, Bulgaria
- ABB Switzerland Ltd, Switzerland

6.1.2. Visits of Staff Members to Foreign Institutions

- Vojtek, M.: Brno University of Technology, Czech Republic, 31.1.-29.4.2016
- Kosterec, M.: Brno University of Technology, Czech Republic, 31.1.-29.4.2016
- Balogh, J.: Brno University of Technology, Czech Republic, 13.-19.3.2016
- Džmura, J.: Brno University of Technology, Czech Republic, 13.-19.3.2016
- Petráš, J.: Brno University of Technology, Czech Republic, 13.-19.3.2016
- Kolcun, M.: VŠB-Technical University of Ostrava, Czech Republic, 15.4.2016
- Petráš, J.: Czech Technical University in Prague, Czech Republic, 15.-19.5.2016
- Vojtek, M.: Czech Technical University in Prague, Czech Republic, 15.-19.5.2016
- Kosterec, M.: Czech Technical University in Prague, Czech Republic, 15.-19.5.2016
- Kruželák, L.: Czech Technical University in Prague, Czech Republic, 15.-19.5.2016
- Cimbala, R.: Brno University of Technology, Czech Republic, 16.-19.5.2016
- Beňa, Ľ.: Brno University of Technology, Czech Republic, 16.-19.5.2016
- Kolcunová, I.: VŠB-Technical University of Ostrava, Czech Republic, 17.10.2016
- Čonka, Z.: Czech Technical University in Prague, Czech Republic, 10.-14.10.2016
- Čonka, Z.: ÓBUDA University Budapest, Hungary, 17.-18.11.2016
- Kolcun, M.: Eurasian National University Astana, Kazachstan, 22.-30.11.2016

6.3 Membership in International Organizations and Societies

- Cimbala, R.: Working Group: Insulation Diagnostics, Manchester, United Kingdom
- Cimbala, R.: Working Group „Static Electricity in Process Industry", Basel, Switzerland
- Cimbala, R.: Institute of Electrical and Electronic Engineers (IEEE), Dielectric and Electrical Insulation Society, USA
- Cimbala, R.: Member of CIGRE Committee, France
- Kolcun, M.: Member of Czech and Slovak National CIGRE Committee
- Kolcun, M.: Member of Czech Committee CIRED
- Kolcun, M.: Member of Slovak WEC Committee
- Kolcun, M.: Member of Editorial Board Journal of Elektrotechnika v praxi, Czech Republic
- Kolcun, M.: Member of Editorial Board Power and Electrical Engineering, Riga, Latvia
- Kolcun, M.: Member of Editorial Board Journal Rynek Energii, Lublin, Poland
- Kolcun, M.: Honorary Professor of Óbuda University, Hungary
- Kolcunová, I.: Honorary Professor of Sankt - Petersburg Power Education Institute of Power Engineering, State Department of Russian Federation, Russia

- Kolcun, M.: nomination of Dr.h.c. Czestochowa University of Technology, Poland
- Balogh, J.: Member of Scientific Board EEA - Electrotehnica Electronica Automatica, Romania
- Cimbala, R.: Member of Scientific Board EEA - Electrotehnica Electronica Automatica, Romania
- Džmura, J.: Member of Scientific Board EEA - Electrotehnica Electronica Automatica, Romania
- Petráš, J.: Member of Scientific Board EEA - Electrotehnica Electronica Automatica, Romania

6.4 Membership in Slovak Organizations and Societies

- Cimbala, R.: Member of Technical Standardization Commission of Slovak Republic - Cables and Electroinsulation Materials, TK No. 53
- Cimbala, R.: Member of WG Electrical Machine Diagnostics, US Steel Košice
- Cimbala, R.: Member of Scientific Council, TU FEI Košice
- Cimbala, R.: Member of Editorial Board JSES – Starnutie elektroizolačných systémov, Košice
- Cimbala, R.: Member of Editorial Board EEN – Elektroenergetika, TU Košice, FEI
- Dolník, B.: Member of Editorial Board JSES – Starnutie elektroizolačných systémov, Košice
- Kolcun, M.: Member of Editorial Board Journal of EE
- Kolcun, M.: Member of Editorial board journal Acta Electrotechnica et Informatica
- Kolcun, M.: Member of Examinational Commission According to Law: No. 70/1998 Statute of Slovakia
- Kolcun, M.: Member of Scientific Council, TU FEI Košice
- Kolcun, K.: Chairman of Editorial Board JSES – Starnutie elektroizolačných systémov, Košice
- Kolcun, K.: Chairman of Editorial Board EEN – Elektroenergetika, TU Košice, FEI
- Kolcunová, I.: Association of Technical Diagnostics
- Kolcunová, I.: Slovak Centre of IEEE
- Kolcunová, I.: Member of Technical Standardization Commission of Slovak Republic - Cables and Electro-insulation Materials, TK No. 53
- Kolcunová, I.: Member of WG for Electrical Machine Diagnostics, US Steel Košice
- Kolcunová, I.: Member of Editorial Board JSES – Starnutie elektroizolačných systémov, Košice
- Kolcunová, I.: Member of Editorial Board EEN – Elektroenergetika, TU Košice, FEI
- Kurimský, J.: Member of WG for Electrical Machine Diagnostics, US Steel Košice
- Kurimský, J.: Executive Editor of EEN – Elektroenergetika, TU Košice, FEI
- Balogh, J.: Member of Technical Standardization Commission of Slovak Republic – Electrical Installations and Protection against Electric Shock, TK No.84
- Balogh, J.: Member of Slovak Electrotechnical Society, TU FEI Košice
- Beňa, Ľ.: Member of Slovak Electrotechnical Society, TU FEI Košice

- Cimbala, R.: Member of Slovak Electrotechnical Society, TU FEI Košice
- Džmura, J.: Chairman of Slovak Electrotechnical Society, TU FEI Košice
- Kolcun, M.: Member of Slovak Electrotechnical Society, TU FEI Košice
- Kolcunová, I.: Member of Slovak Electrotechnical Society, TU FEI Košice
- Medveď, D.: Member of Slovak Electrotechnical Society, TU FEI Košice
- Mészáros, A.: Member of Slovak Electrotechnical Society, TU FEI Košice
- Pavlík, M.: Member of Slovak Electrotechnical Society, TU FEI Košice
- Petráš, J.: Member of Slovak Electrotechnical Society, TU FEI Košice

7 THESES

7.1 Doctoral Theses

1. Čonka, Z. Research of specialized devices designed to improve transient stability of power system. TU Košice, 2016, pp. 108 (Kolcun, M.) (In Slovak)
2. Lisoň, L.: Research of elektrophysical properties of paper insulation impregnated with natural esters. TU Košice, 2016, pp. 116 (Kolcunová, I.) (In Slovak)
3. Kmec, M.: Impact of TCSC device on the distance relay operation, TU Košice, 2016, (Beňa, Ľ.) (In Slovak)
4. Dudiak, J.: Research the impact of smart grid on distribution power system. TU Košice, 2016, pp. 109 (Kolcun, M.) (In Slovak)

Thesis type	Bachelor	Master	Doctoral
Number	42	24	4

8 OTHER ACTIVITIES

8.1 Conferences, Seminars

- Specialized Seminar: Aktuálne problémy elektroenergetiky SR, 10.-11.11.2016, Poráč, Slovak Republic.

8.2 Projects for Industry Companies

- Kolcun, M.: Development expert course Technology for non-engineers II 2016. VSE, a.s. Košice, 2016, Slovak Republic
- Kolcun, M.: The possibilities of 220 and 400 kV discarded cable usage in VSD locality and the analysis of node locality supply possibilities – a SEPS, a.s. study, 2016, Slovak Republic
- Kurimský, J.: Independent result evaluation of inter-laboratory comparison tests VSD, a .s., 2016 Slovak Republic
- Dolník, B.: Technical and expert help during EMI measurements, LEZARD EUROPE, Ltd., 2016, Slovak Republic
- Kolcun, M.: Technical – economical study. VSD, a.s., 2016, Slovak Republic
- Cimbala, R.: Spectral higher harmonics analysis of current and voltage in the network on 110 kV side during ES25MW tests on KS01, measurements and evaluation of spectra in the network. eustream, a.s., 2016, Slovak Republic
- Kurimský, J.: Pulse test by 30000A 8/20 current according to STN EN 61008-1 čl. 9.19.2. SEZ Krompachy, a.s., 2016, Slovak Republic

- Kolcun, M.: The influence of EVO1 shutdown on the operation of ES SR - SEPS, a.s. study, 2016, Slovak Republic
- Kolcun, M.: Measurements of earth connection on V203 with functional tests of protection and indicators of fault currents, VSD, a .s., 2016, Slovak Republic
- Kolcun, M.: Analysis and measurement of VVN cable capacity. VSD, a .s., 2016, Slovak Republic
- Beňa, Ľ.: Technical passportization of public lighting system of Košice town. Košice town. 2016 Slovak Republic
- Cimbala, R.: Calibration of AC/DC Flash tester CLARE A303J. StroptTel, s.r.o. 2016 Slovak Republic
- Cimbala, R.: Calibration / comparison of insulation testers for ED33. U.S. Steel Košice, Ltd. 2016 Slovak Republic
- Kolcun, M.: Test evaluation of the start from the dark on PVE Ružín – EVO – PVE Dobšiná – USSK dated 27.10.2016 (alternate date 10.11.2016) and the proposal of measures. SEPS, a.s. 2016 Slovak Republic
- Kurimský, J.: Partial discharge measurements on cable endings 10 KV before and after voltage tests, VSD, a .s. 2016 Slovak Republic

8.3 Compositions for Dissertation Examinations

- Ploth, M.: Research of Electricity Pricing Methodologies. (Mészáros, A.)
- Gáll, V.: Research of Electricity Pricing Methodologies. (Mészáros, A.)

9 PUBLICATIONS

9.1 Journals

1. YANCHUK, O. M. - TSURKOVA, L. V. - MARCHUK, O.V. - URUBKOV, I. V. - KOLCUN, M. - RUSEK, K. M. - EL NAGGAR, A. M. - ALBASSAM, A. A.: Second-order non-linear optical effects in ZnS nanocrystallites incorporated into different polymer matrices / - 2016. In: Materials Letters. Vol. 169 (2016), p. 131-134. - ISSN 0167-577X *http://www.sciencedirect.com/science/article/pii/S0167577X16301045*.
2. RUSEK, K. M. - EL-NAGGAR, A. M. - ALBASSAM, A - LAKSHMINARAYANA, G. - KOLCUN, M. - CHMIEL, M. - MYRONCHUK, G.: Laser induced birefringence in La–Ga–S–O–Gd glass polymer nanocomposites / - 2016. In: Journal of Materials Science: Materials in Electronics. Vol. 27, no. 7 (2016), p. 6745-6749. - ISSN 0957-4522
3. PETRÁŠ, J. - KURIMSKÝ, J. - BALOGH, J. - CIMBALA, R. - DŽMURA, J. - DOLNÍK, B. - KOLCUNOVÁ, I.: Thermally stimulated acoustic energy shift in transformer oil / - 2016. In: Acta Acoustica United with Acoustica. Vol. 102, no. 1 (2016), p. 16-22. - ISSN 1610-1928
4. LAKSHMINARAYANA, G. - RUSEK, K. M. - EL-NAGGAR, A.M. - ALBASSAM, A.A. - KOLCUN, M. - MYRONCHUK, G.: Influence of the nanoparticle sizes on the photo-induced absorption of La-Ga-S-O-Dy glass nanocomposites / - 2016. In: Physica E: Low-Dimensional Systems and Nanostructures. Vol. 81 (2016), p. 290-293. - ISSN 1386-9477
5. MÁSLO, K. - KASEMBE, A. - KOLCUN, M.: Simplification and unification of IEEE standard models for excitation systems / - 2016. In: Electric Power Systems Research. Vol. 140 (2016), p. 132-138. - ISSN 0378-7796 *http://www.sciencedirect.com/science/article/pii/S0378779616302383*.

6. MIKITA, M. - KOLCUN, M. - ČONKA, Zs. - VOJTEK, M. - ŠPES, M.: Sizing of Small Grid-off Renewable Sources Hybrid in Conditions of North-Eastern Slovakia / - 2016. In: Power and Electrical Engineering. Vol. 33 (2016), p. 31-34. - ISSN 2256-0246 https://journals.rtu.lv/index.php/PEE/article/view/pee.2016.006.
7. ČONKA, Zs. - KOLCUN, M. - KOLCUN, M. ml. - DUDIAK, J. - MIKITA, M. - VOJTEK, M.: Improvement of power system stability using FACTS device / - 2016. In: Power and Electrical Engineering. Vol. 33 (2016), p. 12-15. - ISSN 2256-0246
8. DUDIAK, J. - KOLCUN, M. - ČONKA, Zs. - KOLCUN, M. Jr.: The implementation of smart grid to the simulating toolkit modes / - 2016. In: Power and Electrical Engineering. Vol. 33 (2016), p. 22-25. - ISSN 2256-0246
9. VOJTEK, M. - KOLCUN, M. - ČONKA, Zs. - MIKITA, M.: Cooperation of a Photovoltaic Power Plant with a Battery Energy Storage System / - 2016. In: Power and Electrical Engineering. Vol. 33 (2016), p. 35-39. - ISSN 2256-0246 https://journals.rtu.lv/index.php/PEE/article/view/pee.2016.007.
10. DOLNÍK, B. - ŠPES, M.: Detection of selected EMI Sources in the Prototype of LED Street Light / - 2016. In: Electrotehnică, Electronică, Automatică. Vol. 64, no. 2 (2016), p. 54-62. - ISSN 1582-5175
11. ILENIN, S.: Elektrické inštalácie v zdravotníckom priestore / - 2016. In: Elektroenergetika. Vol. 9, č. 1(2016), pp. 19-22. - ISSN 1337-6756
12. ZDRAVECKÁ, E. - TKÁČOVÁ, J. - TKÁČ, J.: Tribologické povlaky pre tvárniace nástroje / - 2016. In: Strojárstvo. Vol. 20, No. 3 (2016), pp. 22-24. - ISSN 1335-2938
13. TKÁČOVÁ, J. - JAKUBECZYOVÁ, D. - TKÁČ, J.: PVD povlakovanie kovových pásov / - 2016. In: Strojárstvo. Vol. 20, No. 3 (2016), pp. 86-88. - ISSN 1335-2938
14. TKÁČOVÁ, J. - JAKUBÉCZYOVÁ, D. - TKÁČ, J.: PVD povlakovanie kovových pásov / - 2016. In: Strojárstvo. Vol. 20, No. 2 (2016), s. 82-83. - ISSN 1335-2938 http://www.floowie.com/sk/citaj/stroj16-02-web/#/strana/82/zvacsenie/100/.
15. ŠPES, M. - BEŇA, Ľ. - MIKITA, M. - VOJTEK, M. - MÁRTON, M.: Meranie kvalitatívnych parametrov osvetľovacej sústavy verejného osvetlenia / - 2016. In: Posterus.sk. Vol. 9, č. 2 (2016), pp. 1-10. - ISSN 1338-0087 http://www.posterus.sk/?p=18348&output=pdf.
16. ŠPES, M. - BEŇA, Ľ. - MIKITA, M. - VOJTEK, M. - MÁRTON, M. - SULÍROVÁ, I.: Meranie reaktancií synchrónneho alternátora / - 2016. In: Posterus.sk. Vol. 9, č. 4 (2016), pp. 1-9. - ISSN 1338-0087 http://www.posterus.sk/?p=18471&output=pdf.
17. ŠPES, M. - BEŇA, Ľ. - MIKITA, M.: Overenie činnosti digitálneho ochranného terminálu REF 615 s využitím testovacieho zariadenia ochrán CMC156 / - 2016. In: Elektroenergetika. Vol. 9, No. 1 (2016), pp. 5-8. - ISSN 1337-6756 http://jeen.fei.tuke.sk/index.php/jeen/article/view/365/404.
18. ŠPES, M. - BEŇA, Ľ. - MIKITA, M. - VOJTEK, M. - MÁRTON, M: Určenie svetelno-technických parametrov sústavy verejného osvetlenia meraním a využitie pre prax / - 2016. In: Elektroenergetika. Vol. 9, č. 1 (2016), s. 15-18. - ISSN 1337-6756 http://jeen.fei.tuke.sk/index.php/jeen/article/view/367/406.
19. PAVLÍK, M. - SUČKO, P. - KANÁLIK, M. - MEDVEĎ, D.: Aplikácia technického indikátora CCI v prostredí trhu s elektrinou / - 2016. In: Posterus.sk. Vol. 9, No.

6 (2016), pp. 1-7. - ISSN 1338-0087 http://www.posterus.sk/?p=18635.

20. MEDVEĎ, D. - ŠŤASTNÝ, P.: Electric power quality analyzer design using of open-source platform Arduino / - 2016. In: Elektroenergetika. Vol. 9, No. 2 (2016), pp. 9-12. - ISSN 1337-6756 http://jeen.fei.tuke.sk/index.php/jeen/article/view/390/435.
21. MEDVEĎ, D. - HIRKA, O.: Impact of electromagnetic fields in residential areas / - 2016. In: Elektroenergetika. Vol. 9, No. 2 (2016), pp. 13-16. - ISSN 1337-6756 http://jeen.fei.tuke.sk/index.php/jeen/article/view/391/436.
22. RAJNIČ, J. - KURIMSKÝ, J. - KOLCUNOVÁ, I. - CIMBALA, R.: Počiatočné, zhášacie a prierazné napätia v izolácii olej-papier počas tepelného starnutia / - 2016. In: Starnutie elektroizolačných systémov. Vol. 11, No. 1 (2016), pp. 12-14. - ISSN 1337-0103 http://jeen.fei.tuke.sk/index.php/JSES/article/view/389.
23. PAJTÁŠ, M. - KURIMSKÝ, J. - STEHLÍKOVÁ, B. - CIMBALA, R.: Štatistická analýza prierazného napätia polypropylénu počas urýchleného starnutia / - 2016. In: Starnutie elektroizolačných systémov. Vol. 11, No. 1 (2016), pp. 19-21. - ISSN 1337-0103 http://jeen.fei.tuke.sk/index.php/JSES/article/view/387.
24. RÉVÉS, L. - KURIMSKÝ, J. - CIMBALA, R.: Zmena kapacity PP kondenzátora počas urýchleného starnutia / - 2016. In: Starnutie elektroizolačných systémov. Vol. 11, No. 1 (2016), pp. 22-23. - ISSN 1337-0103 http://jeen.fei.tuke.sk/index.php/JSES/article/view/388.
25. GALLIK, M. - CIMBALA, R. - BUCKO, S. - KURIMSKÝ, J.: Tepelná degradácia XLPE káblov / - 2016. In: Starnutie elektroizolačných systémov. Vol. 11, No. 1 (2016), pp. 15-18. - ISSN 1337-0103 http://jeen.fei.tuke.sk/index.php/JSES/article/view/384.
26. HUŽVÁR, Š. - CIMBALA, R. - BUCKO, S. - KURIMSKÝ, J.: Impedančná spektroskopia pevných izolačných materiálov / - 2016. In: Starnutie elektroizolačných systémov. Vol. 11, No. 1 (2016), pp. 8-11. - ISSN 1337-0103 http://jeen.fei.tuke.sk/index.php/JSES/article/view/383.
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EXPERT'S ACTIVITY FOR PRACTICE

of Department of Electric Power Engineering

Diagnostic of High Voltage Power Devices

- diagnostic measurements of insulating systems of high voltage rotating machines by DC methods
- diagnostic measurements of insulating systems of high voltage rotating machines by partial discharge measurements and phase-resolved partial discharge analysis
- DC diagnostics of high voltage cables, bushes and cable terminators
- diagnostics of high voltage transformers
- localisation of PD sources on high voltage devices by means of high-frequency detection
- advising activities

Special Measurement in Electric Power Engineering

- measurement of electric power lines parameters (positive sequence impedance, zero sequence impedance, inductance and capacitance)
- measurement of power device grounding (appraisal of grounding system quality from the aspect of impedance, system integrity and magnitude of contact voltage and step voltage)
- measurement of basic power quality indices
- design and review of relays operation

Expertise and judge activity in electric power engineering focused on:

- Appraisal of extensive earthing systems quality on the basis of:
  - measurement of the impedance,
  - measurement of the touch voltage and step voltage,
  - measurement of the wholeness.
- Determination of overhead transmission line parameters and cable parameters, namely
  - measurement of the line impedance Z (positive sequence, negative sequence and zero sequence components),
  - measurement of the line capacitance,
  - measurement of the mutual reactance (X_{0m}).
- Measurement of the earth impedance of overhead line towers (without disconnecting earthing conductor),
- Inspection of the electrical equipments and appliances.
- Designing in electrical engineering.

DEPARTMENT OF ELECTRONICS AND MULTIMEDIA COMMUNICATIONS

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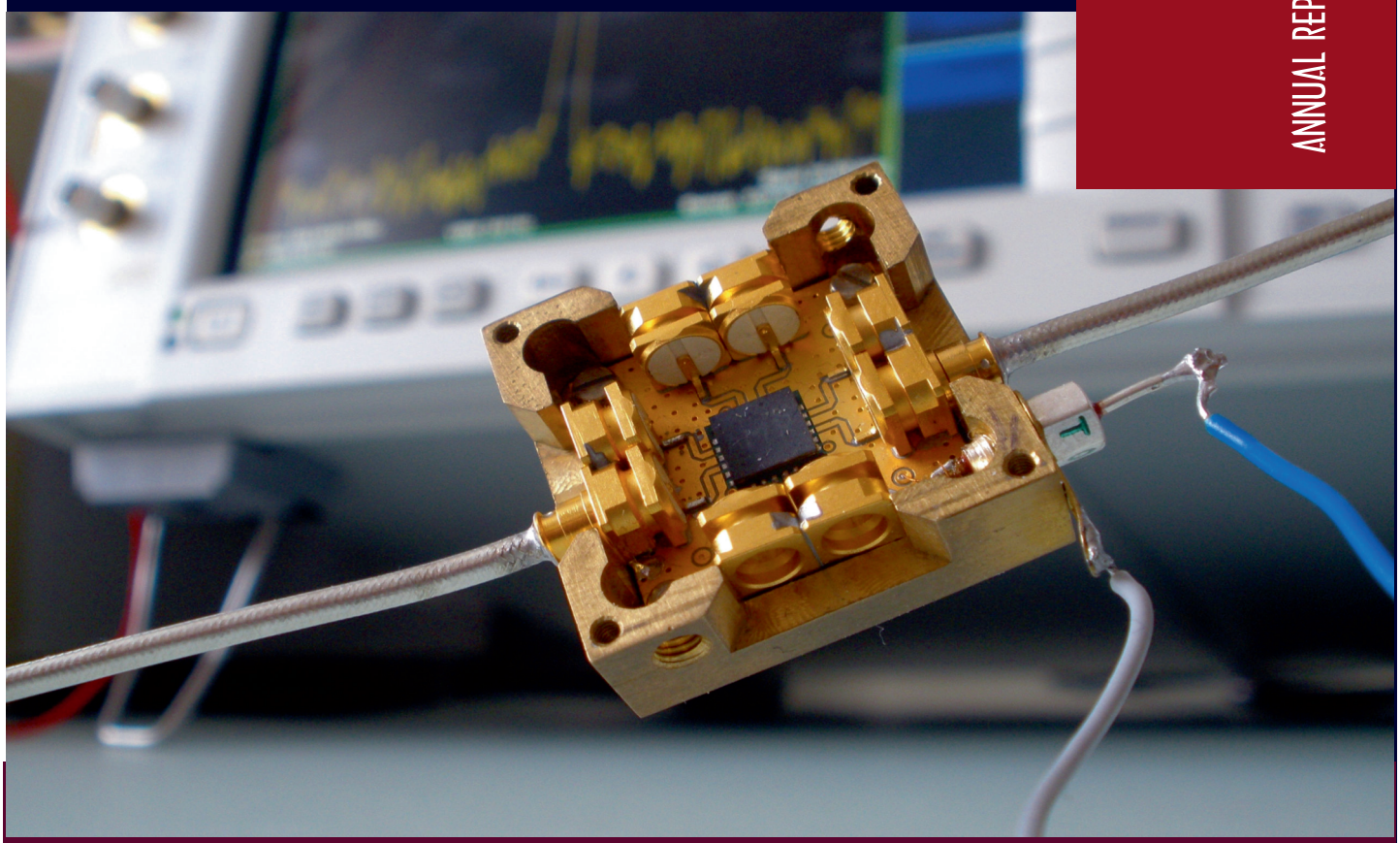
ANNUAL REPORT 2016



The Department of Electronics and Multimedia Communications was founded in 1969. The original name of department was Department of Electronics. The Department offers three types of full-time courses:

Bachelor's Degree lasts in normal way 3 years and is leading to degree Bc. The graduates get more-or-less practical skills in mastering

- Computer Networks,
- Smart Electronics,
- Multimedia Communication Technologies.

Master's Degree course lasts in normal way 2 years and is leading to degree Ing. The graduates get theoretical and practical skills in specialization

- Computer Networks,
- Smart Electronics,
- Multimedia Communication Technologies.

Doctoral Study course lasts in normal way 4 years and is leading to degree PhD. The graduates get erudition in scientific areas

- Computer Networks,
- Electronic Systems and Signal Processing,
- Multimedia Communication Technologies.

Teaching and research activities of the department are focused on advanced technologies of computer networks, electronics, telecommunications and smart measuring systems. In addition to the theoretical and practical basics, the teaching is more concentrated on basics of computer and software engineering, operating and database systems, computer networks, transmission media, computer systems architecture, mobile and satellite technologies and services, automotive electronics, digital processing and transmission of multimedia signals (image, video, speech), cryptography and security in computer and telecommunication networks, optoelectronics and optical communication, sensor systems, interactive telecommunications systems and services.

2 STAFF

Professors:	Dr.h.c. prof. Ing. Anton Čižmár, CSc.	
	prof. Ing. Jozef Juhár, CSc.	
	prof. Ing. Dušan Kocur, CSc.	
	prof. Ing. Dušan Levický, CSc.	
	prof. Ing. Stanislav Marchevský, CSc.	
	prof. Ing. Ján Mihalík, CSc.	
	prof. Ing. Linus Michaeli, DrSc.	
	prof. Ing. Ján Šaliga, CSc.	
	Dr.h.c. prof. RNDr. Ing. JánTurán, DrSc.	
Associate Professors:	doc. Ing. Ľubomír Doboš, CSc.	
	doc. Ing. Miloš Drutarovský, CSc.	
	doc. Ing. Pavol Galajda, CSc.	
	doc. Ing. Ján Gamec, CSc.	
	doc. Ing. Ľuboš Ovseník, PhD.	
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	Ing. Mária Gamcová, PhD.	Ing. Stanislav Ondáš, PhD.
	Ing. Iveta Gladišová, CSc.	Ing. Ján Papaj, PhD.
	Ing. Daniel Hládek, PhD	Ing. Ján Staš, PhD.
Research Assistant:	Ing. Eva Kiktová, PhD.	Mgr. Mária Švecová, PhD.
	Ing. Martin Lojka, PhD.	Ing. Peter Viszlay PhD.
	Ing. Matúš Pleva, PhD.	
Support staff:	Viera Šumáková	Natália Topoľčanská

Ph.D. students:

Internal form:

Ing. Imrich Andráš
Ing. Dávid Čonka
Ing. Pavol Dolinský
Ing. Jozef Greššák
Ing. Vladimír Hajduk
Ing. Dávid Hrabčák
Ing. Tomáš Ivaniga
Ing. Peter Kažimír
Ing. Tomáš Koctúr
Ing. Michal Márton
Ing. Martin Matis
Ing. Dominik Nezník
Ing. Daniel Novák
Ing. Jakub Oravec
Ing. Ján Pastirčák
Ing. Martin Pečovský
Ing. Miroslav Repko
Ing. Ján Ružbarský
Ing. Ján Schneider
Ing. Stanislav Slovák
Ing. Dávid Solus
Ing. Ján Tóth

External form:

Ing. Martin Kmec
Ing. Marek Laban
Ing. Roman Palitefka
Ing. František Rakoci
Ing. Peter Strnisko

3 EQUIPMENT

3.1. Teaching and Research Laboratories

- Laboratory of Multimedia Communications
- Laboratory of Digital Signal Processing and Satellite Communications
- Laboratory of Digital Image Processing and Videocommunication
- Laboratory of Optoelectronic Communications
- Laboratory of Electronic Circuits & Measurement

3.2. Special Laboratories and Equipments

- Laboratory of measurement
- Laboratory of Sensor and Wireless Communication Technologies (SeWiTechLab)
- Laboratory of communication technologies and advanced digital signal processing
- Laboratory of optoelectronics
- Laboratory of multimedia and network security
- Laboratory of speech technologies in telecommunications

4 TEACHING

4.1. Undergraduate Study (Bc.) – Automotive Electronics

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Basics of electronics	2nd	2/3	Galajda
Analogue circuits	3rd	3/2	Kocur
Digital electronics	3rd	3/2	Galajda
Signals and systems	3rd	3/2	Mihalík, Gladišová

Measurements in electronics and telecommunications	4th	2/3	Šaliga
Electronic design tools	4th	3/2	Galajda
Active and passive safety systems of cars	5th	3/2	Gamec
Automotive electronics	5th	3/2	Gamec
Microwave circuits and systems	6th	3/3	Gamec
Programming of embedded systems	6th	2/3	Drutarovský

4.2. Undergraduate Study (Bc.) – Smart Electronics

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Basics of electronics	2nd	2/3	Galajda
Analogue circuits	3rd	3/2	Kocur
Basics of telecommunications technology	3rd	3/2	Levický
Digital electronics	3rd	3/2	Galajda
Signals and systems	3rd	3/2	Mihalík, Gladišová
Measurements in electronics and telecommunications	4th	2/3	Šaliga
Microwave circuits and systems	4th	3/3	Gamec
Electronic design tools	4th	3/2	Galajda
Networks technology 1	4th	3/2	Levický
Communication acoustics	4th	3/2	Juhár
Bachelor thesis	5th	0/6	Juhár
Graphical programming	5th	3/2	Šaliga
Microprocessor technology	5th	3/2	Drutarovský
Networks architecture	5th	3/2	Čižmár
Automotive electronics	5th	3/2	Gamec
Electromagnetic waves and antennas	5th	3/2	Ovseník
Interactive electronic and communication systems	5th	2/3	Juhár
Videocommunications	5th	3/2	Mihalík
Multimedia database systems	5th	2/3	Juhár
Networks technology 2	5th	2/2	Levický
Programming of embedded systems	6th	2/3	Drutarovský
Active and passive safety systems of cars	6th	3/2	Gamec
Optoelectronic systems	6th	3/2	Turán
Satellite technology and services	6th	3/2	Marchevský

4.3. Undergraduate Study (Bc.) – Multimedia Communication Technologies

Subject	Semester	Lectures/exercises (hours per week)	Lecturer
Basics of electronics	2nd	2/3	Galajda
Analogue circuits	3rd	3/2	Kocur
Basics of telecommunications technology	3rd	3/2	Levický
Digital electronics	3rd	3/2	Galajda
Signals and systems	3rd	3/2	Mihalík, Gladišová
Measurements in electronics and telecommunications	4th	2/3	Šaliga
Multimedia technologies	4th	3/2	Staš
Networks technology 1	4th	3/2	Levický
Communication acoustics	4th	3/2	Juhár
Microwave circuits and systems	4th	3/3	Gamec

Bachelor thesis	5th	0/6	Juhár
Communication technology 1	5th	3/2	Marchevský
Networks architecture	5th	3/2	Čižmár
Electromagnetic waves and antennas	5th	3/2	Ovseník
Graphical programming	5th	3/2	Šaliga
Interactive electronic and communication systems	5th	2/3	Juhár
Multimedia database systems	5th	2/3	Juhár
Mobile technologies and services	5th	3/2	Doboš
Videocommunications	5th	3/2	Mihalík
Networks technology 2	5th	2/2	Levický
Communication technology 2	6th	3/2	Maceková
Programming of embedded systems	6th	2/3	Drutarovský
Optoelectronic systems	6th	3/2	Turán
Satellite technology and services	6th	3/2	Marchevský

4.4. Undergraduate Study (Bc.) – Computer Networks

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Basics of algorithms and programming	1st	3/2	Novitzká, Hládek
Programming	2nd	2/2	Tomášek, Hládek
Principles of computer engineering	2nd	2/2	Vokorokos, Maceková
Basic of software engineering	2nd	2/2	Havlice, Ondáš
Computer system architectures	3rd	2/2	Vokorokos, Drutarovský
Object oriented programming	3rd	2/2	Tomášek, Ondáš
Operating systems	3rd	3/2	Genči, Pleva
Basics of electronics and logic circuits	3rd	2/2	Galajda
Introduction to digital communications	3rd	2/2	Doboš
Computer networks	4th	2/2	Čižmár, Bugár
Database systems	4th	3/2	Genči, Staš
Programming in a DotNET	4th	2/2	Havlice
Transmission media	4th	2/2	Ovseník
Multimedia signals in communication networks	4th	2/2	Ovseník
Component programming	4th	2/2	Porubän
Bachelor thesis	5th	0/8	Čižmár
Application of computer networks	5th	2/2	Čižmár, Papaj
Data structures and algorithms	5th	2/2	Kollár, Hládek
Mobile technology and services	5th	2/2	Doboš
Programming audio applications	5th	2/2	Juhár
Satellite technology and services	5th	2/2	Marchevský
Bachelor thesis	6th	0/12	Čižmár
Security of computer systems	6th	3/2	Vokorokos, Drutarovský
Programming of embedded systems	6th	2/2	Drutarovský
Speech interactive communication systems	6th	2/2	Juhár

4.5. Graduate Study (Ing.) – Smart Electronics

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Circuit theory	1th	3/2	Galajda
Digital signal processing	1th	3/2	Mihalík, Gladišová
Optoelectronics	1th	3/2	Turán
Signal and communication interfaces	1th	3/2	Šaliga
Applied cryptography	1th	3/2	Drutarovský
Programmable logic circuits	1th	3/2	Drutarovský
Signal processors	1th	3/2	Drutarovský
Smart antennas	1th	3/2	Ovseník
Digital image processing and coding	2nd	3/2	Mihalík
Diploma project 1	2nd	0/6	Juhár
Processing and transmission of speech and audio signals	2nd	3/2	Juhár
Smart measuring systems	2nd	3/2	Šaliga
Design of integrated circuits for smart applications	2nd	3/2	Galajda
Optical communication systems	2nd	3/2	Turán
High frequency and microwave technology	2nd	3/2	Gamec
Telecommunication systems theory	2nd	3/2	Čižmár
Diploma project 2	3rd	0/6	Juhár
Digital television systems	3rd	3/2	Marchevský
Photonics	3rd	3/2	Turán
Advanced speech applications for communication technology	3rd	3/2	Juhár
Advanced communication systems	3rd	3/2	Kocur
Medical electronics	3rd	3/2	Michaeli
Smart security systems	3rd	3/2	Marchevský
UWB sensor networks	3rd	2/2	Kocur

4.6. Graduate Study (Ing.) – Multimedia Communication Technologies

Subject	Semester	Lectures/exercises (hours per week)	Lecturer
Applied cryptography	1th	3/2	Drutarovský
Digital signal processing	1th	3/2	Mihalík, Gladišová
Optoelectronics	1th	3/2	Turán
Signal and communication interfaces	1th	3/2	Šaliga
Programmable logic circuits	1th	3/2	Drutarovský
Signal processors	1th	3/2	Drutarovský
Smart antennas	1th	3/2	Ovseník
Localization in wireless and mobile systems	1th	3/2	Doboš
Diploma project 1	2nd	0/6	Juhár
Processing and transmission of speech and audio signals	2nd	3/2	Juhár
Optical communication systems	2nd	3/2	Turán
Telecommunication systems theory	2nd	3/2	Čižmár
Design of integrated circuits for smart applications	2nd	3/2	Galajda
Digital image processing and coding	2nd	3/2	Mihalík
High frequency and microwave technology	2nd	3/2	Gamec
Smart measuring systems	2nd	3/2	Šaliga

Diploma project 2	3rd	0/6	Juhár
Mobile communications	3rd	3/2	Doboš
Multimedia technologies	3rd	3/2	Staš
Advanced speech applications for communication technology	3rd	3/2	Juhár
Advanced communication systems	3rd	3/2	Kocur
Digital television systems	3rd	3/2	Marchevský
Photonics	3rd	3/2	Turán
UWB sensor networks	3rd	2/2	Kocur
Satellite technology and services	6th	3/2	Marchevský

4.7. Graduate Study (Ing.) – Advanced Materials and Technologies in Automotive Electronics

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Digital signal processing	1th	3/2	Mihalík, Gladišová
Programmable logic circuits	1th	3/2	Drutarovský
High frequency and microwave technology	2nd	3/2	Gamec
Design of integrated circuits for smart applications	2nd	3/2	Galajda
Smart measuring systems	2nd	3/2	Šaliga
Advanced communication systems	3rd	3/2	Kocur
Smart security systems	3rd	3/2	Marchevský
UWB sensor networks	3rd	2/2	Kocur

4.8. Graduate Study (PhD.) – Electronic Systems and Signal Processing

Subject	Semester	Lectures/exercises (hours per week)	Lecturer
Electronic circuits and signals and systems theory	1th	0/5	Kocur
Foreign language 1	1th	0/2	
Research activities 1	1th	0/5	Turán
Foreign language 2	2nd	0/2	
Complex electronic systems and advanced signal processing methods	2nd	0/5	Kocur
Specialization subject	3rd	0/5	Turán
Research activities 2	3rd	0/5	Turán
Research activities 3	5th	0/5	Turán
Research activities 4	6th	0/5	Turán
Research activities 5	7th	0/5	Turán

4.9. Graduate Study (PhD.) – Multimedia Communication Technologies

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Multimedia and communication systems theory	1th	0/5	Juhár
Foreign language 1	1th	0/2	
Research activities 1	1th	0/5	Levický
Foreign language 2	2nd	0/2	
Modern multimedia communication technologies	2nd	0/5	Juhárr
Specialization subject	3rd	0/5	Levický
Research activities 2	3rd	0/5	Levický

Research activities 3	5th	0/5	Levický
Research activities 4	6th	0/5	Levický
Research activities 5	7th	0/5	Levický

5 RESEARCH PROJECTS

- Integrating Biometrics and Forensics for the Digital Age (*COST Action IC1106*)
- Trustworthy Manufacturing and Utilization of Secure Devices (COST Action IC1204)
- Civil Engineering Applications of Ground Penetrating Radar (COST Action TU1208)
- Wireless Power Transmission for Sustainable Electronics (COST Action IC1301)
- Algorithms, Architectures and Platforms for Enhanced Living Environments (AAPELE), (COST Action IC1303)
- Technological Transfer Network (544197-TEMPUS-1-2013-1-IT-TEMPUS-JPHES)
- Innovative ICT Solutions for the Societal Challenges (2015-1-HR01-KA203-013124 ERASMUS+)
- Research and Development of Modules for Language-Adaptive Multimodal Interfaces (SK-HU-2013-0015)
- Compressing Sensing in Ultra-Wideband (UWB) Sensors for passive radar localization (DAAD - Deutscher Akademischer Austauschdienst project no. APVV-0696-12)
- The Use of TUKE PON Experimental Model in Teaching (Ministry of Education of Slovak Republic KEGA Project, No. 006TUKE-4/2014)
- Interactive Multiview Video Streaming for Supporting Education (Ministry of Education of Slovak Republic KEGA Project, No. 062TUKE-4/2014)
- Transfer of Substantial Results of Research in Speech Technology into Education (Ministry of Education of Slovak Republic KEGA Project, No. 055TUKE-4/2016)
- Mitigation of Stochastic Effect in High-Bitrate All Optical Networks (Project of Agency for Science and Research, No. APVV-0025-12)
- Persons Localization in 3D Under Emergency Event based on UWB Radar System (Project of Agency for Science and Research, No. APVV-0404-12)
- The Research of Coexistence between Broadband LTE Networks and Digital Terrestrial TV Broadcasting DVB-T/DVB-T2 (Project of Agency for Science and Research, No. APVV-0696-12)
- New Generation of Interface for Service Robots Teleoperatoric Control (Project of the Slovak Research and Development Agency, No. APVV-14-0894)
- Automatic Subtitling of Audiovisual Content for Hearing Impaired (Project of the Slovak Research and Development Agency, No. APVV-15-0517)
- Real-Time Operating UWB Sensor Network for Human Beings Detection, Localization and Tracking (Project of Agency for Science and Research, No. APVV-15-0692)
- Cloud Based Human Robot Interaction (Project of the Slovak Research and Development Agency, No. APVV-15-0731)
- Utilization of the Maximum Likelihood Method for Analog to Digital Interface Testing and for the Measurement of Distorted Waveforms by the Non-orthogonal Components (Scientific Grant Agency Project VEGA, No. 1/0281/14)
- Selected Security Topics in Advanced Telecommunications (Scientific Grant

Agency Project VEGA, No. 1/0075/15)
- Personalized Acoustic and Language Modeling (Project of the Ministry of Education, Science, Research and Sport of the SR, No. VEGA 1/0511/17)
- Automatic Dialogue Acts Labelling in Spoken Dialogues (Project of the FEI TUKE of Slovak Republic)

6 CO-OPERATION

6.1. Co-operation in Slovakia

- Elcom s.r.o., Prešov
- Slovak Academy of Science
- Slovak Telekom, a.s.
- VUS - Výskumný ústav spojov, n.o., Banská Bystrica
- ZŤS výskumno-vývojový ústav Košice, a.s.
- Deloitte Advisory, s.r.o., Bratislava
- Smart house, s.r.o., Bratislava
- NAF, s.r.o., Bratislava

6.1.1. Visitors to the Department

- prof. Volodymyr Palahin, Cherkasy State Technological University, Department of Radio Engineering, Information and Telecommunication System, Cherkasy, Ukraine, September 2015 - July 2016.

6.2. International Co-operation

- Austrian Research Institute for Artificial Intelligence (OFAI) of the Austrian Society for Cybernetic Studies
- FTW Telecommunications Research Center Vienna, Austria
- Ingenieur Büro Ralf Klukas, Germany
- INESC Lisabon, Portugal
- Instituto Superior Técnico (IST), Lisbon, Portugal
- Statens Räddningsverk, Sweden
- ŠkodaAuto Mladá Boleslav, Czech Republic
- Wuhan Technological Institute, Wuhan, China
- Second University of Naples, Italy
- Ilmenau University of Technology, Germany
- Hamburg University of Technology, Germany
- AGH University of Science and Technology Krakow, Poland
- Gdansk University of Technology, Poland
- Bulgarian Academy of Sciences, Bulgaria
- Technische Universiteit Delft, Netherlands
- Universitat Ramon Llull, Barcelona, Spain
- Universitat Politècnica de Catalunya Barcelona Tech (UPC), Barcelona, Spain
- Technical University Budapest, Hungary
- Technical University of Ljubljana, Slovenia
- Technical University of Cluj-Napoca, Romania
- University of Firenza, Italy
- University of Gent, Belgium
- University of Maribor, Slovenia

- University of Sannio, Benevento, Italy
- University of Reggio Di Calabria, Italy
- University of Gävle, Sweden
- University in Oulu, Finland
- University of Veliko Turnovo, Bulgaria
- Gjøvik University College, Norway
- Mississippi State University, Starkville, USA
- Fraunhofer Institute for Integrated Circuits IIS (Wireless Distribution Systems / Digital Broadcasting Research Group), Germany

6.2.1. Visit of Staff Members to Foreign Institutions

- Andráš,I., BUTE Budapest, Hungary September 6-9, 2016
- Bugár,G., University of Zadar, Croatia Sept. 11-18, 2016
- Bugár,G., Valencia, Spain December 13-17, 2016
- Čonka,D., Zagreb, Croatia April 17-30, 2016
- Dolinský,P., BUTE Budapest, Hungary September 6-9, 2016
- Drutarovský,M., Dresden, Germany March 16-19, 2016
- Drutarovský,M., TU Ostrava, Czech Republic May 30 - June 1, 2016
- Drutarovský,M., TU Ilmenau, Germany June 19-25, 2016
- Drutarovský,M., Barcelona, Spain November 13-18, 2016
- Galajda,P., Modrava, Czech Republic April 27-29, 2016
- Galajda,P., Aveiro, Portugal May 2-6, 2016
- Galajda,P., TU Ostrava, Czech Republic May 30 - June 1, 2016
- Galajda,P., TU Brno, Czech Republic June 13-14, 2016
- Galajda,P., Aalborg, Denmark September 7-10, 2016
- Galajda,P., TU Brno, Czech Republic November 7-8, 2016
- Gamcová,M., Sofia, Bulgaria March 16-19, 2016
- Grešák,J., University of Zadar, Croatia Sept. 10-17, 2016
- Hajduk,V., University of Zadar, Croatia Sept. 10-17, 2016
- Hládek,D., Miskolc, Hungary March 2, 2016
- Hládek,D., Portorož, Slovenia May 23-28, 2016
- Hládek,D., BUTE Budapest, Hungary November 17-20, 2016
- Juhár,J., Modrava, Czech Republic April 27-29, 2016
- Koctúr,T., Zagreb, Croatia April 17-30, 2016
- Koctúr,T., University of Zadar, Croatia Sept. 10-17, 2016
- Kocur,D., Lisbon, Portugal March 2-5, 2016
- Kocur,D., Sofia, Bulgaria March 16-19, 2016
- Kocur,D., Aveiro, Portugal May 2-6, 2016
- Kocur,D., VUT Brno, Czech Republic June 6-7, 2016
- Kocur,D., BUTE Budapest, Hungary June 9-10, 2016
- Kocur,D TU Ilmenau, Germany June 19-25, 2016
- Kocur,D., TU Ilmenau, Germany August 14-17, 2016
- Kocur,D., Ankara, Turkey Aug. 30 – Sept. 3, 2016
- Kocur,D., Cluj-Napoca, Romania September 6-10, 2016
- Kocur,D., Barcelona, Spain September 21-25, 2016
- Maceková,Ľ., TU Ilmenau, Germany June 19-25, 2016
- Matis,M., Zagreb, Croatia April 17-30, 2016
- Matis,M., University of Zadar, Croatia Sept. 10-17, 2016
- Michaeli,L., Balti, Moldova June 9-12, 2016

- Michaeli,L., BUTE Budapest, Hungary September 6-9, 2016
- Michaeli,L., Benevento, Italy September 17-24, 2016
- Michaeli,L., Benevento, Italy October 1-5, 2016
- Novák,D., Lisbon, Portugal March 2-5, 2016
- Novák,D., TU Ilmenau, Germany August 14-17, 2016
- Ondáš,S., Miskolc, Hungary March 2, 2016
- Ondáš,S., Wroclaw, Poland October 16-18, 2016
- Pečovský,M. TU Ilmenau, Germany Jan. 31 – April 30, 2016
- Pečovský,M. TU Ilmenau, Germany Nov. 26 – Dec. 3, 2016
- Pleva,M., Limassol, Cyprus March 2-6, 2016
- Pleva,M., Starkville, USA May 3-30, 2016
- Schneider,J., Aveiro, Portugal May 2-6, 2016
- Schneider,J., Palanga, Lithuania June 12-16, 2016
- Schneider,J., Blansko, Czech Republic August 29-31, 2016
- Slovák,S., TU Ilmenau, Germany Nov. 26 – Dec. 3, 2016
- Staš,J., Portorož, Slovenia May 23-28, 2016
- Staš,J., Wroclaw, Poland October 16-18, 2016
- Šaliga,J., Chisinau, Moldova February 11-14, 2016
- Šaliga,J., Balti, Moldova June 9-12, 2016
- Šaliga,J., Gdynia, Poland July 14-18, 2016
- Šaliga,J., Chisinau, Moldova August 22-24, 2016
- Šaliga,J., BUTE Budapest, Hungary September 6-9, 2016
- Šaliga,J., Benevento, Italy September 15-19, 2016
- Šaliga,J., Benevento, Italy October 1-5, 2016
- Šaliga,J., Chisinau, Moldova October 26-30, 2016
- Švecová,M., Lisbon, Portugal March 2-5, 2016
- Švecová,M., Sofia, Bulgaria March 16-19, 2016
- Viszlay,P., Portorož, Slovenia May 23-28, 2016

6.3. Membership in International Organizations and Societies

- Čižmár, A.: Member IEEE Affiliate Computer Society, No. 41237162.
- Čižmár, A.: Member of Audio Engineering Society, New York, I.D. 44154.
- Galajda, P.: Member of Czech and Slovak Radioelectronics Engineering Society.
- Galajda, P.: Member of EUROPRACTICE IC Service.
- Juhár, J.: Member of the ISCA (International Speech Communication Association).
- Juhár, J.: Member of EU Domain Committee COST for ICT (Information and Communication Technologies) – National Delegate.
- Juhár, J.: Member of AES (Audio Engineering Society), Memb. No. 76122.
- Juhár J.: Member of IEEE, Memb. No. 90402602.
- Juhár, J.: Member of the editorial board “International Journal of Signal and Imaging Systems Engineering”, Issued by Inderscience Publishers, Geneva, Switzerland.
- Juhár, J.: Member of the editorial board of the journal "Slaboproudý obzor".
- Kocur D.: Member of the editorial board of the journal "Infocommunications Journal".
- Kocur, D.: Member of “Informatics and Electrical Engineering Review Panel of National Research, Development and Innovation Office, Hungary”.

- Levický, D.: Member of Czech and Slovak Radioelectronics Society.
- Michaeli, L.: Head of Slovak IMEKO National Committee and head of the IMEKO Technical Committee TC-4 "Measurement of Electrical Quantities".
- Michaeli, L.: Member of the editorial board „Computer Standard & Interfaces“, Issued by Elsevier, Amsterdam, New York.
- Michaeli, L.: Member of the reviewer board “Measurement”. Journal IMEKO, Issued by Elsevier, Amsterdam, New York.
- Michaeli, L.: Co-ordinator of IMEKO Working Group “AD and DA metrology”.
- Michaeli, L.: Member of the IEEE, Instrumentation & Measurement Society.
- Šaliga, J.: Member of the international board of IMEKO Technical Committee TC-4 "Measurement of Electrical Quantities".
- Šaliga, J.: Member of the editorial board of the journal "Radioengineering".
- Turán, J.: Senior Member of the IEEE.
- Turán, J.: Member of Czech and Slovak Radioelectronics Society.

6.4. Membership in Slovak Organizations and Societies

- Čižmár, A.: Member of Technical Standardization Commission No.41 for Telecommunications In Slovakia.
- Doboš, Ľ.: Member of Technical Standardization Commission No.80 for Radiocommunications In Slovakia.
- Drutarovský, M.: Member of the editorial board of the journal "Acta Electrotechnica et Informatica".
- Juhár, J.: Member of Technical Standardization Commission No.55 for Electroacustics and ultrasound In Slovakia.
- Kocur, D.: Member of the editorial board of the journal "Acta Electrotechnica et Informatica".
- Levický, D.: Member of the editorial board of the journal "Acta Electrotechnica et Informatica".
- Michaeli, L.: Member of the scientific board of Electrotechnical Faculty, University Transport and Communication, Žilina, Slovakia.
- Michaeli, L.: Member of the editorial board „Measurement Science Review“, Issued by SAV, Bratislava.
- Michaeli, L.: Editor in Chief of the editorial board of the journal "Acta Electrotechnica et Informatica".
- Šaliga, J.: Scientific Grant Agency of Slovak Republic.
- Šaliga, J.: Member of scientific board of Slovak Institute of Metrology.
- Šaliga, J.: Member of the editorial board of the journal "Acta Electrotechnica et Informatica".
- Turán, J.: Member of the Slovak Technical Standardization Committee No.53 for Cables, Conductors and Isolating Materials.
- Turán, J.: Member of the Slovak Technical Standardization Committee No.43 for Terminology.
- Turán, J.: Member of the editorial board of the journal "Acta Electrotechnica et Informatica".

6.5. Contracts, International Scientific Projects

- Integrating Biometrics and Forensics for the Digital Age (COST Action IC1106)
- Trustworthy Manufacturing and Utilization of Secure Devices (COST Action IC1204)
- Civil Engineering Applications of Ground Penetrating Radar (COST Action

TU1208)
- Wireless Power Transmission for Sustainable Electronics (COST Action IC1301)
- Algorithms, Architectures and Platforms for Enhanced Living Environments (AAPELE), (COST Action IC1303)
- Technological Transfer Network (544197-TEMPUS-1-2013-1-IT-TEMPUS-JPHES)
- Innovative ICT Solutions for the Societal Challenges (2015-1-HR01-KA203-013124 ERASMUS+)
- Research and Development of Modules for Language-Adaptive Multimodal Interfaces (SK-HU-2013-0015)
- Compressing Sensing in Ultra-Wideband (UWB) Sensors for passive radar localization (DAAD - Deutscher Akademischer Austauschdienst project no. APVV-0696-12)

7 THESES

Thesis type	Bachelor	Master	Doctoral
Number	21	32	6

8 OTHER ACTIVITIES

8.1. Conferences, Seminars

26th International Conference RADIOELEKTRONIKA 2016 is organized by the the Association of Slovak Scientific and Technological Societies – Slovak Electrical Engineering Society in collaboration with the Technical University of Kosice. The scope of the conference is to create a discussion forum for researchers, academics and people in industry, and students who are interested in the latest development in the area of electronics, signal processing, information technologies, microwave technology, their applications and related disciplines. KEaMT FEI TU Košice, Košice, Slovakia, April 19-20, 2016.

(http://kemt.fei.tuke.sk/radioelektronika2016/)

8.2. Awards

Slovak Electrotechnical Society announced the winners of Josef Murgaš Awards for year 2015. The award was won by Ján Papaj from KEMT FEI TU Košice for publishing original theoretical contributions supporting the development of electronic communications in the article "Cooperation between Trust and Routing Mechanisms for Relay Node Selection in Hybrid MANET-DTN". The paper was published in “Mobile Information Systems” journal.
(http://www.vus.sk/ses/dokumenty/SDT/SDTaIS_2016/Tlac_sprava_SDTaIS_2016.pdf)

8.3. Student Competitions and Rewards

- The award for the Best presentation at the Scientific Conference of Young Researchers SCYR 2016 in the section “IT 2-4 year of studies” was won by Ing. Ján Pastirčák for the presentation of the paper “Covariance-based spectrum sensing”.
- The Elfa award for the Best presentation at the Scientific Conference of Young

Researchers SCYR 2016 in the section "EEE 3rd year of study" was won by Ing. Ján Schneider for the presentation of the paper "Wideband Antennas for UWB Radar Systems and their Measurements".

8.4. Compositions for Dissertation Examinations

- ČONKA,D.: Speech Processing for Security and Industrial Applications. FEI TU Košice, Slovakia, March 2016. (supervisor: Čižmár,A.)
- HAJDUK, V.: Modern Methods of Image Steganography and Steganalysis. FEI TU Košice, Slovakia, March 2016. (supervisor: Levický,D.)
- KMEC,M.: Integrated M- sequence based UWB Sensors for Short Range Sensing. FEI TU Košice, Slovakia, September 2016. (supervisor: Galajda,P.)
- KOCTÚR,T.: Recognition and Searching of Information in Audio Documents. FEI TU Košice, Slovakia, March 2016. (supervisor: Juhár,J.)
- MATIS,M.: Context Oriented Routing Protocols for Hybrid MANET-DTN Mobile Network. FEI TU Košice, Slovakia, March 2016. (supervisor: Doboš,Ľ.)
- ORAVEC,J.: Transformation Methods of Image and Video Processing. FEI TU Košice, Slovakia, December 2016. (supervisor: Turán,J.)

9 PUBLICATIONS

9.1 Books

1. ČIŽMÁR,A. - PAPAJ,J.: Theory of Telecommunications Networks In: Košice: TU, Slovakia, 2016, 176 pp.
2. DRUTAROVSKÝ,M.: Jednočípové mikropočítače a jazyk C. In: Košice: TU, Slovakia, 2016, 98 pp.
3. GALAJDA,P. - KMEC,M. - GALAJDOVÁ,A. - LIPTAJ,M.: Širokopásmové obvody, technológie a systémy. In: Košice: TU, Slovakia, 2016, 303 pp.
4. GALAJDA,P.: Návrh integrovaných obvodov. In: Košice: TU, Slovakia, 2016, 149 pp.
5. GLADIŠOVÁ,I. - MIHALÍK,J.: Modulované signály. In: Košice: TU, Slovakia, 2016, 63 pp.
6. KOCUR,D. - BUŠA,J. - FORTES,J. - GAMCOVÁ,M. - GAMEC,J. - NOVÁK,D. - PLAVKA,J. - SCHNEIDER,J. - ŠVECOVÁ,M. - URDZÍK,D.: Detekcia, lokalizácia a sledovanie osôb UWB radarmi krátkeho dosahu. In: Košice: TU, Slovakia, 2016, 229 pp.
7. LEVICKÝ,D.: Kryptografia a bezpečnosť komunikačných sietí. In: Košice: elfa, Slovakia, 2016, 352 pp.
8. MACEKOVÁ,Ľ. - MARCHEVSKÝ,S.: Vybrané problémy teórie a praxe vysielania jedno a viacpohľadových videostrímov v IP sieťach. In: Košice: TU, Slovakia, 2016, 81 pp.
9. MIHALÍK,J. - GLADIŠOVÁ,I.: Náhodné signály a obrazy. In: Košice: TU, Slovakia, 2016, 65 pp.
10. RUIZ,S. - GARCIA-LOZANO,M. - GONZALEZ,D. - LEMA,M. - PAPAJ,J. - JOSEPH,W. - DERUYCK,M. - CARDONA,N. - GARCIA,C. - VELEZ,F.J. - CORREIA,L. - STUDER,L. - GRAZIOSO,P. - CHATZINOTAS,S.: Green and efficient RAN architectures. In: Cooperative Radio Communications for Green Smart Environments, Gistrup: River Publishers, 2016, 195-269 pp.

9.2 Journals

1. GAMEC,J. - SCHNEIDER,J. - GAMCOVÁ,M.: Vivaldi Antenna for UWB Sensor Networks. In: Elektronika ir Elektrotechnika, Vol. 22, no. 4 (2016), pp. 41-45.
2. GLADIŠOVÁ,I. - MIHALÍK,J. - TÓTH,M.: Zovšeobecnená DCT obrazových segmentov pomocou Householderovho algoritmu. In: Posterus, Vol. 9, no. 4 (2016), pp. 1-9.
3. IVANIGA,T. - OVSENÍK,Ľ. - TURÁN,J.: Investigation of SPM in WDM System with EDFA. In: Carpathian Journal of Electronic and Computer Engineering. Vol. 9, no. 2 (2016), pp. 7-12.
4. KOCUR,D. - NOVÁK,D. - ŠVECOVÁ,M.: UWB Radar Signal Processing for Localization of Persons with the Changing Nature of Their Movement. In: Sensors & Transducers, IFSA Publishing, S. L., 2016.
5. KOVÁČ,O. - MIHALÍK,J.: Tvarovanie 3R modelu ľudskej hlavy pomocou steroskopického snímania. In: Elektrorevue, Vol. 18, no. 1 (2016), pp. 15-20.
6. KOVÁČ,O. - MIHALÍK,J. - ČAJKO,P.: Obrazové textúry a ich popisovanie. In: Posterus, Vol. 9, no. 3 (2016), pp. 1-8.
7. KOVÁČ,O. - MIHALÍK,J. - ČAJKO,P.: Algoritmus popisovania obrazových textúr v priestore DWT. In: Posterus, Vol. 9, no. 7 (2016), pp. 1-9.
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9. MATIS,M. - DOBOŠ,Ľ. - PAPAJ,J.: An Enhanced Hybrid Social Based Routing Algorithm for MANET-DTN. In: Mobile Information Systems. Vol. 2016, (2016), pp. 1-12.
10. MÁRTON,M. - OVSENÍK,Ľ. - TURÁN,J. - ŠPES,M.: Application Principle of Sagnac Interferometer in Optical Fiber Gyroscopic System. In: Carpathian Journal of Electronic and Computer Engineering. Vol. 9, no. 2 (2016), pp. 13-17.
11. MÁRTON,M. - IVANIGA,T. - OVSENÍK,Ľ. - ŠPES,M.: Optický vláknový gyroskopický systém ako interferometrický optický senzor. In: Posterus,Vol. 9, no. 2 (2016), pp. 1-14.
12. NOVÁK,D.-SCHNEIDER,J.-KOCUR,D.: Static Person Detection and Localization Based on Their Respiratory Motion Using Various Antenna Types. In: Acta Electrotechnica et Informatica, Vol. 16, no. 3 (2016), pp. 54-59.
13. ORAVEC,J.-TURÁN,J.-OVSENÍK,Ľ.: DWT Steganography with Usage of Scrambling. In: Carpathian Journal of Electronic and Computer Engineering. Vol. 9, no. 1 (2016), pp. 26-29.
14. ORAVEC,J.-OVSENÍK,Ľ.: Arnoldovo zobrazenie, jeho vlastnosti a možné využitie. In: Posterus, Vol. 9, no. 4 (2016), pp. 1-8.
15. PALAHIN,V.-JUHÁR,J.: Joint Signal Parameter Estimation in Non-Gaussian Noise by the Method of Polynomial Maximization. In: Journal of Electrical Engineering, Vol. 67, no. 3 (2016), pp. 217-221.
16. PAPAJ,J.-DOBOŠ,Ľ.: Cooperation between Trust and Routing Mechanisms for Relay Node Selection in Hybrid MANET-DTN. In: Mobile Information Systems, Vol. 2016, (2016), pp. 1-18.
17. PASTIRČÁK,J.-FRIGA,L.-KOVÁČ,V.-GAZDA,J.-GAZDA,V.: An Agent-Based Economy Model of Real-Time Secondary Market for the Cognitive Radio

Networks. In: Journal of Networks and System Management, Vol. 24, no. 2 (2016), pp. 427-443.

18. PETRVALSKÝ,M.-DRUTAROVSKÝ,M.-VARCHOLA,M.: Compact FPGA Hardware Platform for Power Analysis Attacks on Cryptographic Algorithms Implementations. In: Acta Electrotechnica et Informatica, Vol. 16, no. 2 (2016), pp. 3-7.
19. PETRVALSKÝ,M.-DRUTAROVSKÝ,M.: Constant-weight Coding based Software Implementation of DPA Countermeasure in Embedded Microcontroller. In: Microprocessors and Microsystems, Vol. 47, part A (2016), pp. 82-89.
20. REPKO,M.-GAMEC,J.-SCHNEIDER,J.: Jednoduchý odhad relatívnej permitivity steny pomocou UWB radarového systému. In: Elektrorevue, Vol. 18, no. 2 (2016), pp. 27-32.
21. RUMAN,K.-PIETRIKOVÁ,A.-GALAJDA,P.-VEHEC,I.-ROVENSKÝ,T.-KMEC,M.: A New Approach to Construction of Extended Kit for M-Sequence UWB Sensor System based on LTCC. In: Microelectronics International, Vol. 33, no. 3 (2016), pp. 130-135.
22. RUŽBARSKÝ,J.-TURÁN,J.-OVSENÍK,Ľ.: Different Types of Coding Input Data In Optical Transmission Systems. In: Carpathian Journal of Electronic and Computer Engineering. Vol. 9, no. 2 (2016), pp. 3-6.
23. RUŽBARSKÝ,J.-OVSENÍK,Ľ.-NOSÁĽ,M.: Experimentálne overenie vplyvu stimulovaného Brillouinovho rozptylu. In: Posterus, Vol. 9, no. 3 (2016), pp. 1-12.
24. RUŽBARSKÝ,J.-OVSENÍK,Ľ.: Vplyv modulačných techník na kvalitu prenášaného signálu v optických vláknových komunikačných systémoch. In: Posterus, Vol. 9, no. 5 (2016), pp. 1-9.
25. SCHNEIDER,J.-GAMEC,J.-REPKO,M.: Alternatívne spôsoby merania antén s impulzovým UWB radarom. In: DPS : Elektronika od A do Z, Vol. 7, no. 3 (2016), pp. 48-51.
26. SOLUS,D.-OVSENÍK,Ľ.-TURÁN,J.: Optical Correlator in Industrial Image Pattern Recognition System. In: Carpathian Journal of Electronic and Computer Engineering. Vol. 9, no. 2 (2016), pp. 27-31.
27. SOLUS,D.-OVSENÍK,Ľ.: Metódy detekcie objektov s použitím optického korelátora. In: Posterus, Vol. 9, no. 5 (2016), pp. 1-6.
28. SULÍR,M.-JUHÁR,J.: The Influence of Adaptation Database Size on the Quality of HMM-based Synthetic Voice based on the Large Average Voice Model. In: Smart Innovation, Systems and Technologies, Vol. 48 (2016), pp. 127-136.
29. ŠPES,M.-BEŇA,Ľ.-MIKITA,M.-VOJTEK,M.-MÁRTON,M.-SULÍROVÁ,I.: Parametrizácia a testovanie dištančnej ochrany SIPROTEC 7SA611. In: Posterus, Vol. 9, no. 5 (2016), pp. 1-13.
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31. ŠVECOVÁ,M.-KOCUR,D.: Time of Arrival Complementing Method for Cooperative Localization of a Target by Two-Node UWB Sensor Network. In: Radioengineering, Vol. 25, no. 3 (2016), pp. 602-611.

9.3 Patents

1. DRUTAROVSKÝ,M.-VARCHOLA,M.: Elektronický obvod so súčasným generovaním skutočne náhodných čísel a fyzicky nekopírovateľnou funkcionalitou. In: Patentový spis SK 288425 B6/ Banská Bystrica: ÚPV SR, 2016, 9 pp.
2. DRUTAROVSKÝ,M.-VARCHOLA,M.: Elektronický generátor náhodných čísel na báze oscilatorickej metastability s vnútorným testovaním. In: Patentový spis SK 288429 B6/ Banská Bystrica: ÚPV SR, 2016, 9 pp.
3. MICHAELI,L.-ŠALIGA,J.: Tester dynamických chýb číslicovo-analógových prevodníkov. In: Patentový spis SK 288417 B6/ Banská Bystrica: ÚPV SR, 2016, 5 pp.
4. ORAVEC,M.-FIC,M.-ORAVEC,J.: Neodymová tepelná poistka pre sprinkléry s veľkým prietokom. In: Zverejnená priháška úžitkového vzoru č. 191-2015: Vestník ÚPV SR č. 052016/ Banská Bystrica: ÚPV SR, 2016, 1 pp.

9.4 Other publications

Publication Type	Conferences		Other
	Foreign	Home	
Number	16	103	3

DEPARTMENT OF PHYSICS

Head of Department
doc. RNDr. Dušan Olčák, CSc.
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ANNUAL REPORT 2016

Since the foundation of the Department of Physics (1952), the scientific activities of the department have been predominantly oriented to the study of magnetic properties of materials by radiospectroscopic and static magnetic methods. At present, the research is focused on the study of magnetic properties of ferromagnetic materials and on the study of non-metallic materials using nuclear magnetic resonance (NMR) and some other complementary methods.
The department consists of three sections:

- Section of Physics of Magnetic Materials,
- Section of Physics of Macromolecular Systems,
- Section of Physics of Non-Metallic Materials.

In 2009 the Solid State NMR Laboratory was established at the department. The laboratory is a part of the Slovak National NMR Centre and its research is focused on the study of non-metallic materials. The role of the laboratory is to meet research and educational requirements in the field of solid state NMR study of materials in Slovakia. The laboratory contributes to the development of solid state NMR applications in Slovakia.

In 2013 the Laboratory for modification and testing of properties of advanced materials was established at the department within the project "Centre of Excellence for Integrated Research & Exploitation of Advanced Materials and Technologies in Automotive Electronics". The laboratory is equipped with apparatus for the study of thermal and mechanical properties of materials and a desk top electron microscope for the study of surface structure of materials.

The Department of Physics provides compulsory courses in basic physics as well as a number of optional courses in various fields of physics.

Since the academic year 2015/2016, the department offers bachelor, engineer and PhD study programmes Physical Engineering of Advanced Materials. The graduates of this programme:

- acquire knowledge on the structure and physical properties of materials with emphasis on progressive materials,
- acquaint with physical phenomena which are the basis of the methods for investigation and diagnostics of materials, possibilities and procedures of controlled modification of mechanical, thermal, electrical, magnetic and optical properties of various materials,
- acquire basic knowledge on information technologies, and will be skilled in using computer in modelling and simulation of processes in microstructure of materials.

The graduates can find positions in industry (product testing, controlling production processes), in research and development institutes, and in testing, diagnostics and environmental centres. The extent of acquired knowledge creates conditions for good adaptability of graduates in various fields of electrotechnics, electronics and related fields.

2 STAFF

Professors: prof. RNDr. Vladimír Lisý, DrSc.

Associate Professors:
doc. RNDr. Júlia Hlaváčová, CSc.
doc. RNDr. Mária Kovaľaková, PhD.
doc. RNDr. Ladislav Novák, CSc.
doc. RNDr. Dušan Olčák, CSc.
doc. RNDr. Jana Tóthová, PhD.
doc. RNDr. Ján Ziman, CSc.

Assistant Professors:
RNDr. Anton Baran, PhD.
Mgr. Peter Duranka, PhD.
RNDr. Oľga Fričová, PhD.
RNDr. Zuzana Gibová, PhD.
RNDr. Viktor Hronský, CSc.
RNDr. Mária Hutníková, PhD.
RNDr. Ján Kecer, PhD.
RNDr. Mária Kladivová, PhD.
RNDr. Jozef Kravčák, PhD.
Ing. RNDr. Jozef Onufer, PhD.
RNDr. Natália Šmídová, PhD.
RNDr. Peter Vrábel, PhD.

PhD. Students: Mgr. Lukáš Hubač
Ing. Alojz Šoltýs

Technical Staff: Alena Jakabová
Ing. František Mižák

3 LABORATORIES

3.1 Teaching and Research Laboratories

- Laboratories of basic physics
- Solid state NMR laboratory
- Laboratory for magnetic measurements
- Laboratory of physics of macromolecular systems
- Laboratory of advanced materials

3.2 Special Measuring Instruments

- Multinuclear solid state NMR spectrometer Varian 400 MHz
- Experimental apparatus for the study of magnetization characteristics (magnetization curve, susceptibility, magnetoresistance) of ferromagnetic materials
- Desktop electron microscope with disperse rtg spectrometer
- DSC analyser
- Dynamic mechanical analyser
- Sputtering apparatus
- Vibrational viscosimeter SV – 10
- Rotational modular compact rheometer (MCR 502)
- Capillary automated micro viscometer (AMVn)
- DMA 4500 M density meter

4 TEACHING

The Department of Physics gives physical courses for students of the following faculties of the Technical University:

- Faculty of Civil Engineering (SvF)
- Faculty of Electrical Engineering and Informatics (FEI)
- Faculty of Mechanical Engineering (SjF)
- Faculty of Metallurgy (HF)
- Faculty of Mining, Ecology, Process Control and Geotechnologies (FBERG)

4.1 Undergraduate Study (Bc.)

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Physics I (FEI, in English)	1st	2/2	Hlaváčová
Introduction to Physics (FEI)	1st	0/2	Hutníková, Gibová, Baran, Kladivová, Šmídová
Physics 1 (SvF)	1st	2/2	Onufer
Introduction to Physics (SvF)	1st	0/2	Hutníková

Physics 1 (FBERG)	2nd	2/2	Tóthová
Physics I (FBERG)	2nd	2/2	Tóthová
Physics (FBERG)	2nd	2/2	Tóthová

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Physics (FBERG) – external study	2nd	2/0	Baran
Physics 1 (FBERG) – external study	2nd	2/0	Baran
Physics I (FBERG) – external study	2nd	2/0	Baran
Physics II (FEI)	2nd	3/2	Hlaváčová, Gibová
Physics II (FEI, in English)	2nd	3/2	Hlaváčová
Physics II (FEI) – external study	2nd	2/0	Baran
Physics (SjF)	2nd	2/2	Novák
Physics (SjF) – external study	2nd	2/0	Kecer
Physics II (SvF)	2nd	2/2	Onufer
Physics (SvF)	2nd	2/2	Kovaľaková
Physics 1 (HF)	2nd	2/2	Ziman
Physics Fundamentals (HF) – external study	2nd	3/0	Ziman
Physics II (FEI)	3rd	3/2	Olčák
Physics 2 (HF)	3rd	2/2	Ziman
Physics II (FBERG)	3rd	2/2	Tóthová
Physical measurement	3rd	2/3	Gibová
Introduction to Quantum Mechanics	3rd	2/3	Kovaľaková
Selected Topics in Physics	3rd	2/3	Kecer
Thermodynamics and Statistical Physics	4 th	3/2	Kladivová
Structure and Properties of Materials	4 th	3/2	Kravčák
Solid State Physics	5th	2/2	Hronský
Experimental Methods for Materials Study	5th	3/3	Olčák, Kladivová, Fričová, Tóthová, Ziman, Kravčák
Basic Physics of Magnetic Materials	5th	2/2	Novák
Bachelor project	5th	2/6	Tóthová, Kovaľaková, Kravčák

4.2 Graduate Study (Ing.)

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Physics 2 (FBERG)	1st	2/2	Tóthová
Physics III (FBERG)	1st	2/3	Baran
Physics 2 (FBERG) – external study	1st	2/0	Onufer
Physics III (FBERG) – external study	1st	2/0	Baran
Physics of Solid Phase	2nd	2/2	Hronský
The Core Knowledge of Study Field Physical Engineering and its Applications	4 th	4/0	Ziman, Fričová, Olčák, Šmídová, Vrábel
Diploma Thesis	4 th	9/9	Onufer, Olčák

5 RESEARCH PROJECTS

- *Anomalous properties of suspensions of nanoparticles and polymers*, S.G.A. project No. 1/0348/15, Principal investigator: prof. RNDr. V. Lisý, DrSc.
- *Dynamics of magnetization processes in amorphous ferromagnetic materials*, S.G.A. project, No. 1/0413/15. Principal investigator: doc. RNDr. J. Ziman, CSc.
- *Improvement of physics teaching at the Technical University of Košice using video-demonstration experiments*, Project KEGA, No. 032TUKE-4/2014, Principal investigator: doc. RNDr. Mária Kovaľaková, PhD.
- *Recuperation in electromobile through electromagnetic fields*, Grant Project „Technology developed through technology" of Foundation Volkswagen Slovakia, Principal investigator: RNDr. Jozef Kravčák, PhD.
- *Studying of chosen biodegradable materials using NMR spectroscopy,* Grant FEI TUKE – FEI-2015-12, Principal investigator: RNDr. Peter Vrábel, PhD.

6 CO-OPERATION

6.1 Co-operation in Slovakia

- Faculty of Chemical and Food Technology, Slovak University of Technology, Bratislava
- Faculty of Science, Comenius University in Bratislava
- Institute of Experimental Physics of the Slovak Academy of Sciences, Košice
- Institute of Inorganic Chemistry of the Slovak Academy of Sciences, Bratislava
- Institute of Physics, Faculty of Science, P. J. Šafárik University in Košice
- Joint Laboratory of Glass VILA, Alexander Dubček University of Trenčín
- Polymer Institute, Slovak Academy of Sciences, Bratislava

6.2 Visitors to the Department

- Doc. Dr. Antal Lovas, DrSc., Budapest University of Technology and Economics, Hungary

6.3 International Co-operation

- Budapest University of Technology and Economics, Hungary
- Central Physical Research Institute, RMKI KFKI, Budapest, Hungary
- Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Prague, Czech Republic
- Institute of Physics, A. Mickiewicz University, Poznan, Poland
- Joint Institute for Nuclear Research, Dubna, Russia
- Uzhorod National University, Ukraine

6.4 Membership in Slovak Organizations and Societies

- Gibová, Z.: member of the Slovak Physical Society (SFS)
- Hronský, V.: member of SFS and the Slovak Magnetic Society (SMAGS)
- Kecer, J.: member of member of SFS SMAGS
- Kladivová, M.: member of the Slovak Physics Olympiad, SFS, JSMF, and SMAGS

- Lisý, V.: Scientific Grant Agency of the Slovak Republic, member of the permanent commission for the awards of DrSc. degrees in Condensed Matter Physics and Acoustics, member of SFS
- Novák, L.: member of SFS and SMAGS
- Olčák, D.: member of SFS and SMAGS
- Onufer, J.: member of SFS and vice-president of SMAGS
- Šmídová, N.: member of SFS
- Tóthová, J.: member of SFS
- Ziman, J.: member of SFS and SMAGS

7 THESES

7.1 Doctoral Theses

- HUBAČ Lukáš: Possibilities of Properties Modification of Selected Ferromagnetic Alloys, Košice: TU - 2016.

8 8 OTHER ACTIVTIES

9 PUBLICATIONS

9.1 Monographs

1. ZIMAN, J. - KLADIVOVÁ, M.: Dynamika doménových stien v magnetických mikrodrôtoch s cirkulárnou anizotropiou. 1. vyd. - Košice: Technická univerzita - 2016. - 130 s. - ISBN 978-80-553-3029-7.

9.2 Journal Papers

1. KOVAĽAKOVÁ, M. - OLČÁK, D. - HRONSKÝ, V. - VRÁBEL, P. - FRIČOVÁ, O. - CHODAK, I. - ALEXY, P. - SUČIK, G.: Morphology and molecular mobility of plasticized polylactic acid studied using solid-state C-13- and H-1-NMR spectroscopy. In: Journal of Applied Polymer Science. Vol. 133, no. 23 (2016), p. 188-198. - ISSN 0021-8995
2. HUTNÍKOVÁ, M. - FRIČOVÁ, O.: Solid-State NMR Study of Poly(3-Hydroxybutyrate) and Ecoflex® Blends. In: Acta Physica Polonica A. Vol. 129, no. 3 (2016), p. 388-393. - ISSN 0587-4246
3. CHMIELEWSKÁ, E. - HODOSSYOVÁ, R. - KOVAĽAKOVÁ, M. - URÍK, M.: Comparable phosphate adsorption onto some natural aluminosilicates vs. Fe(III)oxihydroxide. In: Desallination and Water Treatment. Vol. 57, no. 16 (2016), p. 7387-7395. - ISSN 1944-3994
4. TÓTHOVÁ, J. - LISÝ, V.: A note on the fluctuation–dissipation relation for the generalized Langevin equation with hydrodynamic backflow. In: Physics Letters A. Vol. 380, no. 33(2016), p. 2561-2564. - ISSN 0375-9601
5. GIBOVÁ, Z. - FRIČOVÁ, O. - KLADIVOVÁ, M. - KECER, J. - HUTNÍKOVÁ, M. - KOVAĽAKOVÁ, M.: Rotational motion of a rigid body with the system IP–Coach. In: Physics Education. Vol. 32, no. 1 (2016), p. 1-7. - ISSN 0970-5953.
6. GIBOVÁ, Z.: Ako zatraktívniť prednášky z fyziky. In: Posterus.sk. Roč. 9, č. 9 (2016), s. 1-8. - ISSN 1338-0087

6. GIBOVÁ, Z.: Ako zatraktívniť prednášky z fyziky. In: Posterus.sk. Roč. 9, č. 9 (2016), s. 1-8. - ISSN 1338-0087
7. LISÝ, V. - TÓTHOVÁ, J.: An Efficient Method to Study Nondiffusive Motion of Brownian Particles. In: EPJ Web of Conferences: Mathematical modeling and computational physics 2015. - Stará Lesná: EDP Sciences, 2016 Vol. 108, no. (2016), p. 1 - 6. - ISBN 978-2-7598-1944-7
8. Kladivová, M. – KOVAĽAKOVÁ, M. – GIBOVÁ, Z. – FRIČOVÁ, O. – HUTNÍKOVÁ, M. – KECER, J.: Laboratory experiment for the study of friction forces using rotating apparatus. European Journal of Physics, Volume 37, Number 6
9. STUDENYAK, I. P. - BENDAK, A. V. - DEMKO, P. Yu. - STUDENYAK, Viktor I. - IZAI, V. Yu. - VOROKHTA, M. - MATOLÍN, V. - KÚŠ, P. - LISÝ, V. - KOMADA, P. - KASHAGANOVA, G.: Influence of external factors on optical parameters in Cu6PS5I thin films. In: Proceedings of SPIE: Optical Fibers and their Applications 2015. - Poland : SPIE, 2016 Vol. 9816 (2015), p. 1-8. - ISBN 978-1-5106-0057-7 - ISSN 0277-786X.

9.3 Other publications

Publication Type	Articles on Internet	Conference Papers		Conference Abstracts		Textbooks
		Foreign	Home	Foreign	Home	0
Number	0	2	5	0	5	

DEPARTMENT OF MATHEMATICS AND THEORETICAL INFORMATICS

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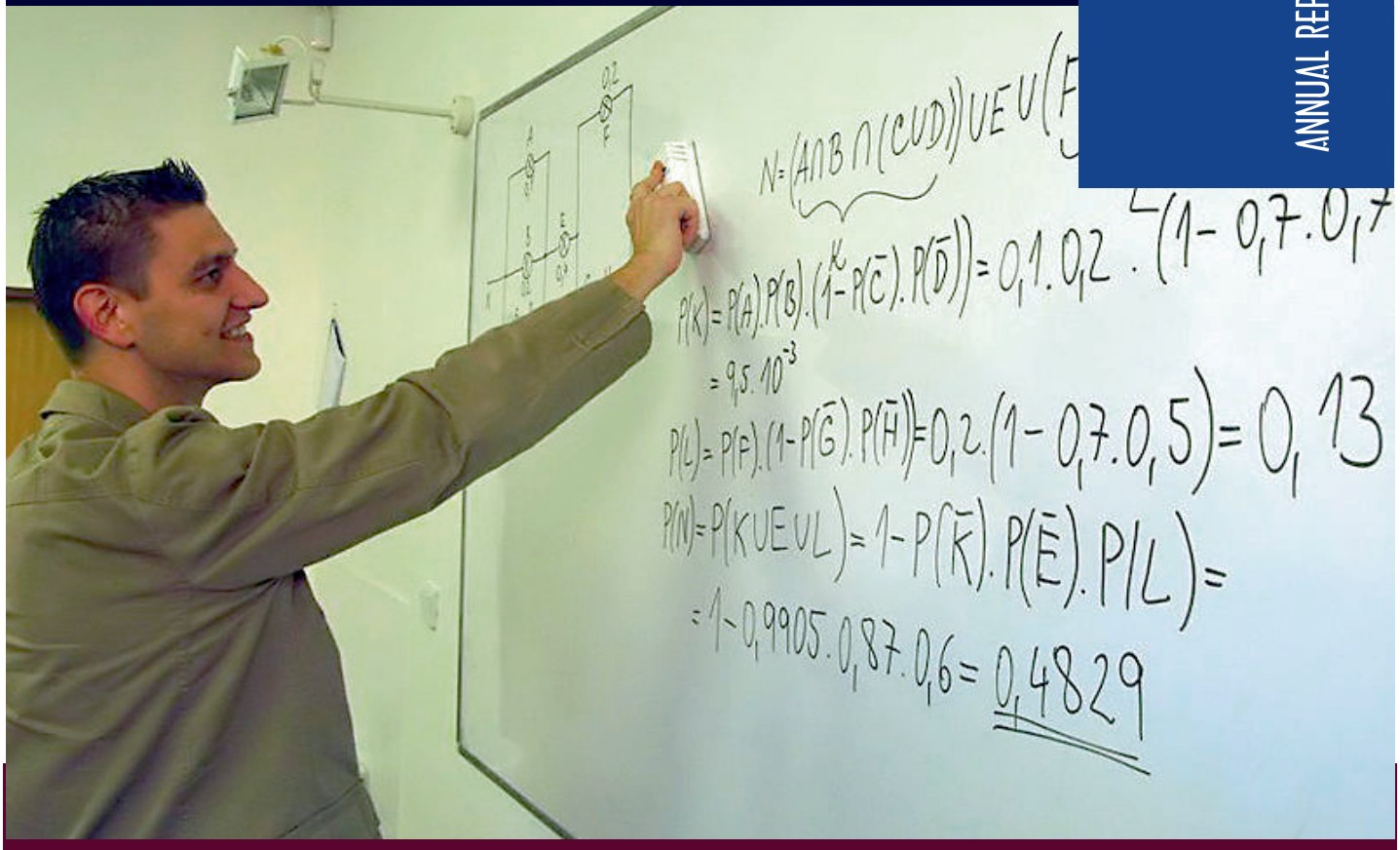
KATEDRA MATEMATIKY A TEORETICKEJ INFORMATIKY

ANNUAL REPORT 2016



Department of Mathematics and Theoretical Informatics, before 1981 Department of Mathematical Informatics, was founded in 1969. The activities of the teachers are oriented to the mathematical research and education. The main educational goal is to prepare undergraduate students during the first two years of study in the following courses: Differential and integral calculus; Theory of complex variable functions; Ordinary differential equations; Qualitative theory of differential equations; Linear algebra; Mathematical statistics; Laplace, Fourier, and Z-Transformations; Numerical methods; Discrete mathematics and Mathematical modelling, Coding theory, Algorithms and complexity. In addition to the basic courses, the programs of the courses for graduate study were adjusted in co-operation with special departments. Members of the department prepared new lectures on various topics of applied mathematics for graduate study and for PhD students, such as Algorithms and complexity, Theory of queues, Fuzzy sets, Selected topics from mathematics, Financial mathematics, Optimization methods, Solving ill-posed problems. Since 2008 the Department offers its own study programme Computer modelling. This is focused on computer-aided mathematical simulation of diverse problems.

Present research projects of the Department of Mathematics and Theoretical Informatics are oriented on the next problems:

- Asymptotic properties of higher order functional differential equations
- The study of the scaling laws in nonlinear systems and in the developed turbulence using renormalization group methods
- Algebraic structures and graph algorithms in max-plus and max-min algebras
- Topological graph theory – crossing numbers of graphs
- E-learning of mathematical subjects

The Department consists of two parts:

- Mathematics Section
- Section of Theoretical Informatics

2 STAFF

Professors: prof. RNDr. Jozef Džurina, CSc.
prof. RNDr. Ján Plavka, CSc.

Associate Professors: doc. RNDr. Marián Klešč, PhD.
doc. RNDr. Blanka Baculíková, PhD.
doc. RNDr. Helena Myšková, PhD.

Assistant Professors: RNDr. Štefan Berežný, PhD.
RNDr. Ján Buša, CSc.
RNDr. Emília Draženská, PhD.
RNDr. Anna Grinčová, PhD.
RNDr. Monika Molnárová, PhD.
PhDr. Eva Ostertagová, PhD.
RNDr. Anna Pavlisková, PhD.
Mgr. Jana Petrillová, PhD.
Mgr. Ján Pribiš, PhD.
RNDr. Štefan Schrötter, CSc.
RNDr. Michal Staš, PhD.
RNDr. Mária Timková, PhD.

Technical Staff: Lenka Ondejková

3 LABORATORIES

- LabIT4KT-1: Laboratory of Computer Modelling (prototype unit of the project IT4KT)
- LabIT4KT-2: Laboratory of Numerical Mathematics (prototype unit of the project IT4KT)

4 TEACHING

4.1. Undergraduate Study (Bc.)

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Repetition of Mathematics	1st	0/3	Baculíková, Berežný, Grinčová, Draženská, Molnárová, Ostertagová, Pavlisková, Pribiš Petrillová, Plavka, Schrötter, Staš Timková

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Repetition of Mathematics	1st	2/0	Buša
Discrete Mathematics	2nd	3/3	Klešč, Myšková
Mathematics II	2rd	3/3	Džurina, Pribiš
Mathematics II	2rd	2/0	Buša
Mathematics II	2nd	2/2	Grinčová
Mathematics I	3rd	2/0	Buša
Numerical Methods, Probability and Statictic	3rd	3/2	Klešč, Myšková, Pribiš,
Numerical Methods, Probability and Statictic	3rd	2/0	Schrötter
Theory of Coding	3rd	2/2	Plavka
Applications of Differential Equations	4nd	2/2	Baculíková
Algorithms and Complexity	4nd	2/2	Plavka
Numerical Methods, Probability and Statictic	5th	3/3	Buša
Mathematical and Computing Modelling	5th	2/2/1	Džurina
Typographical System TEX	5th	1/2/1	Berežný
Financial Mathematics	6th	2/2	Grinčová
Operation Analysis	6th	2/2	Petrillová

4.2. Graduate Study (Ing.)

Subject	Semester	Lectures/exercises (hours per week)	Name of lecturer
Applied Statistics	7th	2/2	Ostertagová
Differentional Equations and Variational	7th	2/2	Džurina

Calculus			
Optimalization Methods	7th	2/2	Buša
Physical Processes Modelling	7th	2/2	Buša
Discrete Dynamic Systems	8th	2/2	Molnárová
Linear and Quadratic Programing	8th	2/2	Staš
Graph Algorithms and Discrete Optimization	9th	2/2	Schrötter
Queueing Theory	9th	2/2	Berežný
Mathematical Methods for Neural Networks and Time Series	9th	2/2	Staš
Theory of Coding	9th	2/2	Plavka

5 RESEARCH PROJECTS

- *Invariants of non-planar graphs – crossing numbers*. VEGA Slovak Grant Agency No. 1/0389/15, duration 2015-2017, co-ordinator: Marián Klešč.
- *Scaling in Stochastic Dynamics: Influence of Random Fluctuations on Diffusion, Kinetic Processes, and Phase Transitions.* VEGA Slovak Grant Agency No. 1/0222/13, duration 2013-2016, co-ordinator: Ján Buša.

6 CO-OPERATION

6.1. Co-operation in Slovakia

The members of department work in the main research projects described above and they are involved in research projects at other institutions:

- Faculty of Science UPJŠ, Košice
- Faculty of Mathematics, Physics and Informatics UK, Bratislava
- Special Departments of FEI TU, Košice
- Institute of Experimental Physics of Slovak Academy of Sciences, Košice
- Faculty of Natural Science, Žilina

6.1.1. Visitors to the Department

- Prof. Vasile Berinde, Technical University of Cluj-Napoca, Department of Mathematics and Informatics, Baia Mare, Romania
- Prof. Marie Demlová, Czech Technical University in Prague, Faculty of Electrical Engineering, Department of Mathematics, Czech Republic
- Vladimír Francisti, master of mathematics, University of Novi Sad, Department of Mathematics and Informatics, Serbi
- Dr. Edik Hayryan, Joint Institute for Nuclear Research, Dubna, Russia
- Dr. Shura Hayryan, Institute of Physics, Academia Sinica, Taipei, Taiwan
- Prof. Dr. Péter Körtesi, University of Miskolc, Department of Analysis of the Institute of Mathematics, Hungary

6.2. International Co-operation

- Technical University in Graz, Austria
- Charles University in Prague, Czech Republic
- Czech Technical University in Prague, Czech Republic
- University of Birmingham, United Kingdom

- UHK in Hradec Králové, Czech Republic
- Texas Univeresity, Kingsville, USA
- Veszprem University, Hungary
- Technical university of Cluj-Napoca, North University at Baia Mare, Romania
- JINR Dubna, Russia
- University of Miskolc, Hungaria
- Institute of Physics, Academia Sinica, Taiwan

6.3. Membership in International Organizations and Societies

- Buša, J.: Czechoslovak TeX Users Group (CSTUG)
- Klešč, M.: American Mathematical Society
- Plavka, J.: International Linear Algebra Society

6.4. Membership in Slovak Organizations and Societies

- Baculíková, B.: Slovak Mathematical Society
- Berežný, Š.: Slovak Mathematical Society
- Buša, J.: Slovak Mathematical Society
- Buša, J: Committee for the Cooperation of the Slovak Republic with JINR, Dubna
- Draženská, E.: Slovak Mathematical Society
- Džurina, J.: Slovak Mathematical Society
- Grinčová, A.: Slovak Mathematical Society
- Klešč, M.: OK 9-1-6 Discrete Mathematics
- Klešč, M.: Slovak Mathematical Society
- Molnárová, M.: Slovak Mathematical Society
- Plavka, J.: OK 9-1-6 Discrete Mathematics
- Schrötter, Š.: Slovak Mathematical Society

6.5. Contracts, International Scientific Projects

- CEEPUS – partner in CEEPUS III program CIII-HU-0028-09-1516 – Active Methods in Teaching and Learning Mathematics and Informatics
- CEEPUS – partner in CEEPUS III program CIII-HU-0028-10-1617 – Active Methods in Teaching and Learning Mathematics and Informatics

7 THESES

Thesis type	Bachelor	Master	Doctoral
Number	5	15	0

8 OTHER ACTIVITIES

8.1 Workshops

- Buša, J.: 17-th Conference of Košice Mathematicians, April 2016, Herľany, Slovakia; co-organiser

8.2 Study tours

- Baculíková, B., Berežný, Š., Buša, J., Džurina, J., Ostertagová, E., Staš, M.:

Czech Technical University in Prague, Faculty of Electrical Engineering, Department of Mathematics, Czech Republic
- Berežný, Š., Buša, J.: Eszterházy Károly University, Institute of Mathematics and Informatics, Hungary
- Berežný, Š.: Technical University of Cluj-Napoca, Department of Mathematics and Informatics, Baia Mare, Romania
- Pribiš, J.: JINR Dubna, Russia

8.3 Coordinator activity of CEEPUS

- Berežný, Š.: Ceepus meeting in Miskolc as deputy coordinator at DMTI; University of Miskolc, Department of Analysis of the Institute of Mathematics, Hungary

9 PUBLICATIONS

9.1. Books

1. KOCUR, D. – BUŠA, J. – FORTES, J. – GAMCOVÁ, M. – GAMEC, J. – NOVÁK, D.I – PLAVKA, J. – SCHNEIDER, J. – ŠVECOVÁ, M. – URDZÍK, D.: Detekcia, lokalizácia a sledovanie osôb UWB radarmi krátkeho dosahu. 1. ed., TU Košice, 2016, 229 pp., ISBN 978-80-553-2648-1.
2. MYŠKOVÁ, H.: Dynamic systems with inexact data: algorithms and theory. 1. ed., Košice, Equilibria, 2016, 107 pp., ISBN 978-80-8143-181-4.
3. BEREŽNÝ, Š. – STAŠ, M.: Lineárne a kvadratické programovanie. - 1. ed., TU Košice, 2016, 128 pp., ISBN 978-80-553-2625-2.
4. DŽURINA, J. – BACULÍKOVÁ, B. – PETRILLOVÁ, J.: Matematicko počítačové modelovanie. 1. ed., TU Košice, 2016, 79 pp., ISBN 978-80-8143-184-5.
5. GRINČOVÁ, A. – PETRILLOVÁ, J.: Matematika 2, zbierka riešených a neriešených úloh. 1. ed., TU Košice, 2016, 92 pp., ISBN 978-80-553-2577-4.
6. GRINČOVÁ, A. – PIRČ, V. – GALAJDOVÁ, A. – JENČÍK, M. – ŠIMŠÍK, D.: Matematika 2 pre študentov s poruchami zraku. 1. ed., TU Košice, 2016, 115 pp., [CD ROM], ISBN 978-80-553-2572-9.

9.2. Journals

1. ANDREJIOVÁ, M. – GRINČOVÁ, A.: The experimental research of the conveyor belts damage used in mining industry. Acta Montanistica Slovaca. Vol. 21, no. 3 (2016), p. 180-190. ISSN 1335-1788.
2. ANDREJIOVÁ, M. – GRINČOVÁ, A.: Monitoring and analysis of the influence of the selected parameters to the conveyor belt damages. Annals of Faculty Engineering Hunedoara – International Journal of Engineering. Vol. 14, no. 3 (2016), p. 35-38. ISSN 1584-2665.
3. ANDREJIOVÁ, M. – GRINČOVÁ, A.: The regression analysis as the tool to determine the mathematical model of dynamic stress of the conveyor belt. Mathematical Modelling and Geometry. Vol. 4, no. 2 (2016), p. 1-9. ISSN 2311-1275.
4. AYRIYAN, A. – BUŠA, J. Jr. – DONETS, E. E. – GRIGORIAN, H. – PRIBIŠ, J.: Algorithm and simulation of heat conduction process for design of a thin

multilayer technical device. Applied Thermal Engineering. Vol. 94 (2016), p. 151-158. ISSN 1359-4311.

5. DOVICA, M. – BUŠA, J. – SPIŠÁK, E. – FABIAN, M. – IŽOL, P. – FABIANOVÁ, J.: Assessment of complex free form surfaces with surface profile deviation. Manufacturing Technology. Vol. 16, no. 4 (2016), p. 673-680. ISSN 1213-2489.
6. DŽURINA, J. – BACULÍKOVÁ, B. – JADLOVSKÁ, I.: New oscillation results to fourth-order delay differential equations with damping. Electronic Journal of Qualitative Theory of Differential Equations. Vol. 2016, no. 7 (2016), p. 1-15. ISSN 1417-3875.
7. FRANKOVSKÝ, P. – OSTERTAG, O. – TREBUŇA, F. – OSTERTAGOVÁ, E. – KELEMEN, M.: Methodology of contact stress analysis of gearwheel by means of experimental photoelasticity. Applied Optics. Vol. 55, no. 18 (2016), p. 4856-4864. ISSN 1559-128X.
8. GRINČOVÁ, A. – ANDREJIOVÁ, M. – MARASOVÁ, D.: Failure analysis of conveyor belt in terms of impact loading by means of the damping coefficient. Engineering Failure Analysis. Vol. 68 (2016), p. 210-221. ISSN 1350-6307.
9. MYŠKOVÁ, H.: Interval max-plus matrix equations. Linear Algebra and its Applications. Vol. 492 (2016), p. 111-127. ISSN 0024-3795.
10. OSTERTAG, O. – FRANKOVSKÝ, P. – OSTERTAGOVÁ, E. – TREBUŇA, F.: Application of the harmonic star method in photoelastic separation of principal stresses. Applied Optics. Vol. 55, no. 3 (2016), p. 425-431. ISSN 1559-128X.
11. OSTERTAGOVÁ, E. – OSTERTAG, O.: Methodology and application of Savitzky-Golay moving average polynomial smoother. Global Journal of Pure and Applied Mathematics. Vol. 12, no. 4 (2016), p. 3201-3210. ISSN 0973-1768.
12. OSTERTAGOVÁ, E. – FRANKOVSKÝ, P. – OSTERTAG, O.: Application of polynomial regression models for prediction of stress state in structural elements. Global Journal of Pure and Applied Mathematics. Vol. 12, no. 4 (2016), p. 3187-3199. ISSN 0973-1768.
13. OSTERTAGOVÁ, E.: Štatistická analýza rezíduí lineárneho regresného modelu. Transfer inovácií. No. 33 (2016), p. 7-9. ISSN 1337-7094.
14. PLAVKA, J.: Computing the greatest X-eigenvector of a matrix in max-min algebra. Kybernetika. Vol. 52, no. 1 (2016), p. 1-14. ISSN 0023-5954.
15. TREBUŇA, F. – OSTERTAGOVÁ, E. – FRANKOVSKÝ, P. – OSTERTAG, O.: Application of Polynomial Regression Models in Prediction of Residual Stresses of a Transversal Beam. American Journal of Mechanical Engineering. Vol. 4, no. 7 (2016), p. 247-251. ISSN 2328-4102.
16. ZHANG. Ch. – BACULÍKOVÁ, B. – DŽURINA, J. – LI T.: Oscillation results for second-order mixed neutral differential equations with distributed deviating arguments. Mathematica Slovaca. Vol. 66, no. 3 (2016), p. 615-626. ISSN 0139-9918.

9.3. Other publications

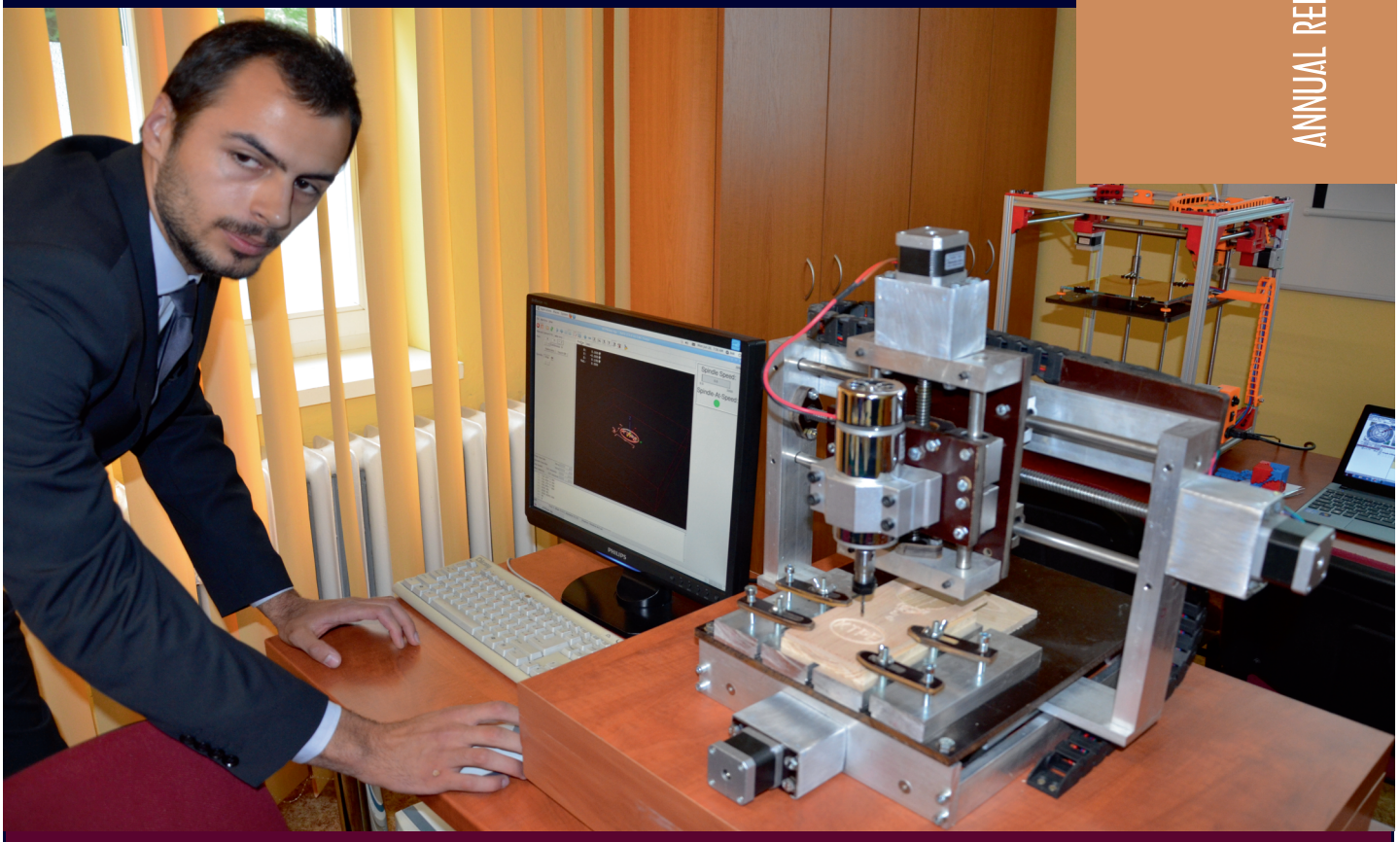
Publication Type	Confereces		Other
	Foreign	Home	
Number	0	3	4

DEPARTMENT OF THEORETICAL AND INDUSTRIAL ELECTRICAL ENGINEERING

Head of Department
prof. Ing. Dobroslav Kováč, PhD.
E-mail: Dobroslav.Kovac@tuke.sk

http://ktpe.fei.tuke.sk, Tel./Fax: +421 55 602 2801

ANNUAL REPORT 2016



Department of Theoretical and Industrial Electrical Engineering is a workplace, which guarantees the bachelor, master and doctoral study program Industrial Electrical Engineering. In addition to that, department's employers provide education for FEI TU students on all three-education levels. Professional field of the department is oriented on area of theoretical electrical engineering, where students learn the fundamental laws of electrical engineering and area of industrial engineering where students learn basic information and skills regarding the construction and service of basic industrial systems and information technologies. Graduates also gain knowledge about the application of modern methods of automated and industrial measurement.

The research activity of the department is concentrated in the following areas:

- Study of the electrical, magnetic and structural properties of lanthanides and their thin films at low temperatures and in magnetic fields
- Electromagnetic field analysis of the electrotechnical products from the point of view of its electromagnetic compatibility
- Integrated research and exploitation the advanced materials and technologies in the automotive electronics
- Modern virtual, intelligent and automated measuring and control systems.
- Applied microcomputer and smart information circuits in industrial systems.

2 STAFF

Professors: prof. Ing. Dobroslav Kováč, PhD.
prof. Ing. Irena Kováčová, PhD.

Associate Professors: doc. Ing. Ján Dudáš, DrSc.
doc. Ing. Miroslav Mojžiš, PhD.
doc. RNDr. Darina Špaldonová, PhD.
doc. Ing. Iveta Tomčíková, PhD.

Assistant Professors: Ing. Radoslav Bučko, PhD.
Ing. Milan Guzan, PhD.
Ing. Anna Hodulíková, PhD.
Ing.Ján Molnár, PhD.
Ing. Tibor Vince, PhD.
Ing. Jozef Dziak, PhD.

Technical staff: Jozef Lenart
Danuša Topolčaniová

PhD. Students: Ing. Matej Bereš
Ing. Dávid Schweiner
Ing. Patrik Jacko

3 LABORATORIES

- laboratory for industrial control systems
- two laboratories for electrical measurement
- laboratory for basics of electrical engineering
- PC laboratories
- laboratory for Internet remote measuring systems

4 TEACHING

4.1. Undergraduate Study (Bc.)

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Fundamentals of Electrical Engineering	1st	2/2	Tomčíková, Dudáš, Hodulíková
Electrotechnics	2nd	3/2	Guzan, Hodulíková, Špaldonová, Tomčíková
Digital Measurement	2nd	2/2	Mojžiš
Electrotechnical Practical Lessons	2nd	0/3	Mojžiš, Bučko
MS Office in Technical Practice	2nd	2/2	Špaldonová
Programming of Industrial Applications I	2nd	2/2	Vince
Windows server	3rd	2/2	Vince
Industrial Electrical Engineering	3rd	3/3	Molnár, Bereš
CAD systems in Electrotechnics	3rd	2/3	Špaldonová, Tomčíková, Guzan
Informatics and Industrial Measurement	3rd	2/2	Mojžiš, Guzan
Computational, Office and Multimedial Technique	4th	2/2	Guzan
Programming of Industrial Applications II	4th	2/2	Dziak, Bereš
Semestral Project II	4th	0/3	Kováč
Metrology	5th	2/2	Mojžiš, Guzan
Modelling and Measurement	5th	2/2	Molnár
Applied Electronics	5th	2/3	Kováčová
Database Systems SQL ORACLE	5th	2/2	Molnár
Bachelor´s Project	5th	0/6	Kováč, Tomčíková

4.2. Undergraduate Study for Foreign Students (in English language)

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturers
Fundamentals of Electrical Engineering	1st	2/2	Hodulíková, Dudáš, Bučko, Tomčíková
Electrotechnics	2nd	3/2	Guzan, Hodulíková, Špaldonová, Tomčíková
Windows server	3rd	2/2	Vince

4.3. Graduate study (Ing.)

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
EMC	8th	2/2	Kováčová
Linux II	7th	2/2	Molnár

5 RESEARCH PROJECTS

- *Centre of Excellence of the Integrated Research & Exploitation the Advanced Materials and Technologies in the Automotive Electronics*. ITMS 26220120055, activity 2.5 - Laboratory for modeling and measuring (MODMER), duration: 2010-2013, co-ordinator: D. Kováč, members: I. Tomčíková, M. Guzan, T. Vince, R. Bučko, J. Molnár, M. Bačko, J. Perduľak.
- *Investigation of postnatal neurogenesis in relation to neurodegeneration.* Project VEGA No. 2/0069/15, duration: 2015-2017, co-ordinator: J. Molnár, members: I. Kováčová, D. Kováč, T. Vince, M. Bereš.

6 CO-OPERATION

6.1. Co-operation in Slovakia

- Department of Experimental Physics, P.J. Šafárik University, Košice
- Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava
- Institute of Electrical Engineering, Slovak Academy of Science, Bratislava
- Department of Metal Physics, Institute of Experimental Physics, Slovak Academy of Sciences, Košice
- Department of Low Temperature Physics, Institute of Experimental Physics, Slovak Academy of Sciences, Košice
- Institute of Material Research, Slovak Academy of Sciences, Košice
- Institute of Neurobiology, Slovak Academy of Sciences, Košice
- Volkswagen, Slovakia
- LVD II Slovakia - Unicorn Tornaľa
- Molex Slovakia, a.s.
- SPP, a.s.
- BSH Drives and Pumps, s.r.o., Michalovce
- Antik Telecommunications

6.2. International Co-operation

- The Czech Academy of Science, Prague, Czech Republic
- Czech Technical University in Prague, Czech Republic
- Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland
- Institute of Physics, A. Mickiewicz University, Poznan, Poland
- Politechnika Czestochowska, Poland
- Stefan cel Mare University, Suceava, Romania
- Silesian University of Technology, Gliwice, Poland
- University, Budapest, Hungary
- University of Florence, Italy

- University of Applied Sciences, Harz, Germany
- University, Miskolc, Hungary
- University of West Bohemia, Pilsen, Czech Republic
- Magna Steyr, Graz, Austria
- Kremenchuk Mykhailo Ostrohradskyi National University, Ukraine

6.3. Membership in International Organizations and Societies

- D. Kováč: Member of the team of evaluators of The Grant Agency of Czech Republic
- D. Kováč: Member of Editorial Board of Journal "Acta Technica"

6.4. Membership in Slovak Organizations and Societies

- J. Dudáš: Member of the Slovak Vacuum Society
- J. Dudáš: Member of the Slovak Electrotechnical Society
- J. Dudáš: Member of the Slovak Physical Society
- D. Kováč: Member of the Slovak Committee for Measuring and Evaluating of Electrical Power
- D. Kováč: Member of Editorial Board of Journal "Acta Electrotechnica et Informatica"
- D. Kováč: Member of Slovak Commission for Ph.D. Study in the Branch of Theoretical Electrical Engineering
- D. Kováč: Member of Scientific council of FEE&I TU of Košice
- M. Mojžiš: Member of Technical Standardization Committee

7 THESES

Thesis type	Bachelor	Master	Doctoral
Number	5	13	1

8 OTHER ACTIVITIES

9 PUBLICATIONS

9.1. Books

1. OCILKA, M. – KOVÁČ, D.: Electrical circuits for induction heating. Technical university of Košice, 1st edition, 2016, 118 pages, ISBN 978-80-553-2550-7
2. DZIAK, J. – TOMČÍKOVÁ, I.: Simulation of linear and non-linear electrical circuits by MATLAB. Technical university of Košice, 1st edition, 2016, 108 pages, ISBN 978-80-553-2610-8

9.2. Journals

1. BUČKO, R.: Mobile application for control unit of intelligent building. In: *Posterus*, Vol. 9, no. 7 (2016), p. 1-10, ISSN 1338-0087
2. GUZAN, M. – ASTALOŠ, J. – DVORČÁK, P.: Reconstructing Boundary Surface of Chua`s Circuit by Paraview. In: *Electromechanical and energy saving systems*, Vol. 33, no. 1 (2016), p. 145-153, - ISSN 2072-2052

9.3. Textbooks

1. KOVÁČ, D.: Applied electrical engineering. 1st edition, *TU Košice*, 2016, 184 p., ISBN 978-80-553-2551-4
2. KOVÁČOVÁ, I.: ZOSP – 7th part. 1st edition, *TU Košice*, 2016, 87 p., ISBN 978-80-553-2484-5
3. KOVÁČOVÁ, I.: ZOSP – 8th part. 1st edition, *TU Košice*, 2016, 89 p., ISBN 978-80-553-2485-2
4. ŠPALDONOVÁ, D.: Technical document creation: 1st part – Electromagnetic field. 1st edition, *TU Košice*, 2016, 85 p., ISBN 978-80-553-2503-3
5. ŠPALDONOVÁ, D.: Technical document creation 2nd. 1st edition, *TU Košice*, 2016, 68 p., ISBN 978-80-553-2585-9

9.4. Other publications

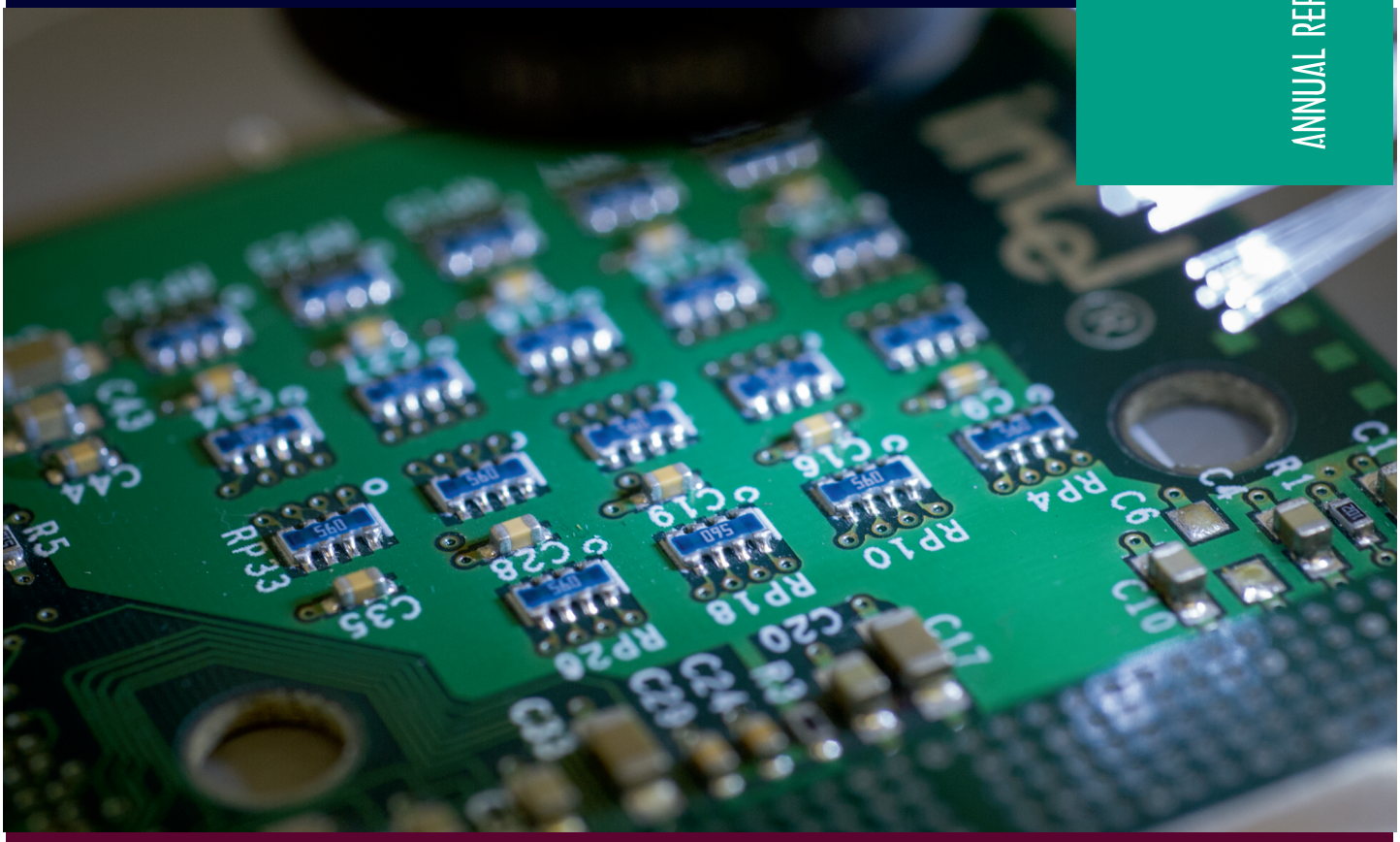
Publication Type	Confereces		Other
	Foreign	Home	
Number	5	3	47

DEPARTMENT OF TECHNOLOGIES IN ELECTRONICS

Head of Department
prof. Ing. Alena Pietriková, CSc.
E-mail: Alena.Pietrikova@tuke.sk

http://www.tuke.sk/fei-kte/, Tel./Fax: +421 55 602 3195

ANNUAL REPORT 2016



The Department of Technologies in Electronics (Katedra technológií v elektronike – KTE) was founded in 1991. The Department offers three types of full-time courses:
Bachelor's Degree course “Technologies in automotive electronics” lasts in normal way 3 years and is leading to degree Bc. The graduates get more-or-less practical skills in mastering automotive electronics.

Master's Degree course "*Technologies in automotive electronics*" lasts in normal way 2 years and is leading to degree Ing. The graduates get theoretical and practical skills in the area of automotive electronic with the aspect on progressive materials and technologies.

PhD. course "*Technologies in automotive electronics*" lasts in normal way 4 years and is leading to degree PhD. The graduates get erudition in scientific areas and acquire deeper knowledge in specific area of materials and technologies in automotive electronics.

The subjects in the degree courses are orientated to technologies in electronics with the accent on automotive electronics: mounting technology in electronics, printed circuit boards, thick film technology, LTCC technology and polymer technology.

The basic research activities of the Department are concentrated on:

- research, development and application of latest trends in the field of mounting technology in electronic,
- investigation of materials and structures of solder joints,
- research and development of microsystems and hybrid sensors,
- LTCC multilayer modules,
- quality and reliability of electronic systems.

2 STAFF

Professors:	prof. Ing. Alena Pietriková, CSc. prof. Ing. Stanislav Slosarčík, CSc. prof. Ing. Juraj Banský, CSc. Dr.h.c. prof. Ing. Miloš Somora, CSc.
Associate Professors:	doc. Ing. Juraj Ďurišin, PhD.
Assistant Professors:	Ing. Slavomír Kardoš, PhD. Ing. Ľubomír Livovský, PhD. Ing. Igor Vehec, PhD. Ing. Pavol Cabúk, PhD. Ing. Ondrej Kováč, PhD. Ing. Tibor Rovenský, PhD. (from August 2016)
Research Staff:	Igor Vehec
Secretary:	Mgr. Alena Focková
Ph.D. Students:	Ing. Tibor Rovenský (defended PhD thesis in June 2016) Ing. Peter Lukács Ing. Tomáš Girašek Ing. Peter Balog Ing. Samuel Žuk

3 LABORATORIES

3.1. Teaching and Research Laboratories

- Laboratory of Technological Processes I.
- Laboratory of Technological Processes II.
- Virtual Technological Laboratory and CAD design systems.
- Laboratory of Diagnostics and Thermal Processing.
- Laboratory of Optical Diagnostics and Control of Electronic Structures.
- Laboratory of Measurements in Electronics.

3.2. Special Laboratories and Equipment

- Laboratory of Thick-film and LTCC Technology (covers full process from CAD design to printing, firing and assembly including die wire bonding).
- Laboratory of InkJet Printing.
- Laboratory of Quality and Reliability (thermal shock and climatic chamber, pull/shear test).
- Laboratory of Material Analysis (grinder-polisher, material microscopy).

4 TEACHING

4.1. Undergraduate Study (Bc.)

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Fundamentals of Materials Engineering	1st	2/2	Pietriková, Kardoš, Ďurišin, Vehec, Cabúk
Fundamentals of Microelectronic Technologies	4th	2/2	Vehec
Fundamentals of Technologies in Electronics	4th	2/2	Kardoš
Measurement of Electronics Structures	5th	2/2	Cabúk
CAD Systems for Hybrid and LTCC Circuits	5th	2/2	Vehec
Bachelor Project	5th	0/8	Pietriková
Automated Measuring Systems	6th	2/2	Livovský
Methods of Quality Evaluation in Technologies in Automotive Electronics	6th	2/2	Ďurišin
Bachelor Work	6th	0/12	Pietriková

4.2. Graduate Study (Ing.)

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Production Processes in Electronics I	1st	3/3	Pietriková
Methods of Reliability in Electronics	1st	2/2	Pietriková
Design Systems in Electronic	1st	2/2	Livovský
Production Processes in Electronics	1st	2/3	Slosarčík
Diploma Project 1	2nd	0/4	Pietriková
Production Processes in Electronics II	2nd	2/3	Slosarčík

Quality Management	2nd	2/2	Pietriková
Diploma Project 2	3rd	0/8	Pietriková
Physical Principles and Design of Microsystems	3rd	3/2	Somora
Manufacturing Technologies, Structure, Properties and Applications of Sensors	3rd	2/2	Banský
Microcontrollers in Automotive Electronics	3rd	2/2	Livovský
Materials for Electrotechnical Applications	3rd	2/2	Pietriková
Main Knowledge of Study Field Progressive Materials and Technologies in Automotive Electronic and its Application	4th	2/2	Pietriková
Diploma Work	4th	0/18	Slosarčík

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

Subject	Semester	Lectures/exercises (hours per week)	Name of Lecturer
Fundamentals of Material Engineering	1st	2/2	Pietriková
Production Processes in Electronics	3rd	3/2	Pietriková

4.4. Postgraduate Study (PhD.)

Subject	Semester	Lectures/exercises (hours per week)
Electrotechnology and Materials	1st	0/2
Scientific Research 1	1st	0/10
Analyse Methods of Electronic Materials and Structures	2nd	0/10
Scientific Research 2	3rd	0/10
Subject of the Branch	3rd	0/10
Scientific Research 3	5th	0/10
Scientific Research 4	6th	0/10
Scientific Research 5	7th	0/10
Dissertation Project	3rd	5/15
Dissertation Thesis	8th	5/15

5 RESEARCH PROJECTS

5.1. International Projects

- *Enhancement of journal article publications of young scientists from V4 region, Visegrad fund, Small Grant*. Proj. No. 11540055. Local coordinator: prof. Ing. Alena Pietriková, CSc. Duration: 2016.

5.2. Research Projects

- *Development of New Generation Joints of Power Electronics Using Nonstandard Sn-based Alloys* (Vývoj novej generácie spojov výkonovej elektroniky s použitím neštandardných zliatin na báze cínu). Project APVV-14-0085. Coordinator: prof. Ing. Alena Pietriková, CSc. Duration: 2015 - 2018.

- *Vertical Lower Limbs Rehabilitation Device for Spatial Mobility of Patient* (Vertikálne *rehabilitačné* zariadenie dolných končatín umožňujúce priestorovú mobilitu pacienta). Project VEGA 1/0074/15. Coordinator: prof. Ing. Stanislav Slosarčík, CSc. Duration: 2015 - 2018.
- *Electrical Properties of Soldered and Bonded Joints in Microelectronics* (*Elektrické* vlastnosti spájkovaných a kontaktovaných spojov v mikroelektronike). Project VEGA 1/0776/14. Coordinator: doc. Ing. Juraj Ďurišin, PhD. Duration: 2014 - 2016.
- *Implementation of New Research Trends into Education in the Area of Progressive Materials and Intelligent Technologies of Auto Electronics* (*Implementácia* nových trendov výskumu do vzdelávania v oblasti progresívnych materiálov a inteligentných technológií autoelektroniky). Project KEGA 002TUKE-4/2014. Prof. Alena Pietriková, CSc. Duration: 2014 - 2016.
- *The Impact Analysis of Plasma Surface Treatment of Polymeric Substrates in Inkjet Printing Technology* (Analýza vplyvu plazmy na povrchovú úpravu *polymérnych* substrátov v technológii InkJet Printing). Project FEI-2015-11. Coordinator: Ing. Peter Lukács. Duration: 2016.

6 CO-OPERATION

6.1. Co-operation in Slovakia

The Department of Technologies in Electronics has entered into the long-term based co-operation with:

6.1.1. Industrial Partners

- Magneti Marelli Slovakia, s.r.o. research, development, education
- ELCOM, s.r.o., Prešov research, development
- PreDops, s.r.o., Prešov research, development, education
- MICRONIC, s.r.o., Kysak research, development, education
- ELPRO, s.r.o., Košice development, education
- Sensor, s.r.o., Košice research, development
- Semikron, s.r.o., Vrbové research, development
- SMK Logomotion, Bratislava research, development
- Michatek, k.s., Michalovce research, development
- Samsung Electronics Slovakia, s.r.o., Galanta research, development

6.1.2. Academic Partners

All academic partners intensively co-operate on all of above fields – research, development and education, too:

- Department of Electrotechnology, FEI STU Bratislava,
- Department of Electronics and Electrotechnology, EF ŽU in Žilina,
- Institute of Electronics and Photonics, FEI STU Bratislava,
- Slovak Academy of Science, Košice.

6.2. International Co-operation

The Department of Technologies in Electronics has entered into long-term international co-operation with:

- FEL ČVUT Prague, Czech Republic,
- IMT Bucharest, Romania, bilateral co-operation SK/Ro project,

- University POLITEHNICA of Bucharest (UPB), COST,
- Budapest University of Technology and Economics (BME), COST,
- Politechnika Rzeszow, Poland.

6.3. Visits of Staff Members to Foreign Institutions

• Cabúk, P., Germany (Berlin)	13.03. – 18.03.2016
• Pietriková, A., Hungary (Budapest)	18.04. – 21.04.2016
• Rovenský, T., Germany (Ilmenau)	18.04. – 27.04.2016
• Rovenský, T., Germany (Ilmenau)	04.05. – 13.05.2016
• Slosarčík, S., Poland (Rzeszów)	06.05. – 06.05.2016
• Rovenský, T., Germany (Ilmenau)	24.05. – 02.06.2016
• Kardoš, S., CZ (Hustopeče)	25.05. – 27.05.2016
• Pietriková, A., CZ (Hustopeče)	25.05. – 27.05.2016
• Cabúk, P., CZ (Hustopeče)	25.05. – 27.05.2016
• Vehec, I., CZ (Hustopeče)	25.05. – 27.05.2016
• Žuk, S., CZ (Pilsen)	17.05. – 22.05.2016
• Lukács, P., CZ (Pilsen)	17.05. – 22.05.2016
• Girášek, T., CZ (Pilsen)	17.05. – 22.05.2016
• Pietriková, A., CZ (Pilsen)	17.05. – 22.05.2016
• Slosarčík, S., Poland (Lublin)	11.06. – 12.06.2016
• Cabúk, P., Germany (Frankfurt)	28.06. – 29.06.2016
• Banský, J., Germany (Munich)	16.08. – 19.08.2016
• Pietriková, A., CZ (Pilsen)	05.09. – 08.09.2016
• Ďurišin, J., Germany (Hamburg)	23.10. – 26.10.2016
• Pietriková, A., CZ (Brno)	04.11. – 05.11.2016

6.4. Membership in International Organizations and Societies

- Banský, J.: Honorary Consul of Federal Republic Germany in Slovak Republic.
- Pietriková, A.: Member of the International Steering Committee for International Spring Seminar on Electronics Technology – ISSE.
- Slosarčík, S.: Member of the International Steering Committee for IMAPS – Czech and Slovak.
- Slosarčík, S.: Member of “Scientific Committee”, International Interdisciplinary PhD Workshop I2PhDW.
- Pietriková, A.: Member of the International Steering Committee for IMAPS Poland Conference.
- Pietriková, A.: Member of Editorial Board of Scientific Bulletin of University of Pitesti – Series: Electronics and Computer Science, (Romania).
- Pietriková, A.: Member of the International Technical Program Committee and Editorial Board for Conference on Diagnostics in Electrical Engineering (Diagnostika).
- Slosarčík, S.: Member of “International Program Committee”, The International Conference on Advances in Electronic and Photonic Technologies.
- Pietriková, A.: Member of IMAPS CZ&SK.
- Slosarčík, S..: Member of IMAPS CZ&SK.
- Livovský, Ľ.: Member of IMAPS CZ&SK.
- Cabúk, P.: Member of IMAPS CZ&SK.
- Vehec, I.: Member of IMAPS CZ&SK.

6.5. Membership in Slovak Organizations and Societies

- Banský, J.: Vice-Chairman of the Board of Directors "East Slovakian Investment Agency".
- Pietriková, A.: Member of the SRDA (APVV) Agency Council for Programme "Support for building personnel infrastructure in all sectors of research and development in Slovakia for the period 2016-2019" (LP).
- Pietriková, A.: Member of Editorial Board "ACTA ELECTROTECHNICA ET INFORMATICA".
- Pietriková, A.: Member of Cultural and Educational Commission KEGA No.3.
- Pietriková, A.: Chair of the Commission for Ph.D. Study in the Branch "5-2-12 Electrotechnology and Materials" at FEI TU Košice.
- Pietriková, A.: Member of the Commission for Ph.D. Study in the Branch "5-2-12 Electrotechnology and Materials" at Faculty of Electrical Engineering, University of Žilina.
- Slosarčík, S.: Member of the Slovak Metrology Society.
- Pietriková, A.: Member of Scientific Board at TUKE.
- Pietriková, A.: Vice-president of Scientific board at FEI TUKE.
- Livovský, Ľ.: Member of the Faculty Academic Senate at FEI TUKE.

7 THESES

Thesis type	Bachelor	Master	Doctoral
Number	0	12	1

8 OTHER ACTIVITIES

8.1. Symposia, Workshops, Conferences

- PADS Roadshow 2016: workshop organized by CADware, s.r.o. at the Department of Technologies in Electronics, 27.10.2016.

8.2. Invited Lectures

- PIETRIKOVÁ, A.: Real-time Profiling of Reflow Process in VPS Chamber. 40th International Microelectronics and Packaging IMAPS Poland 2016 Conference, September 25-28, Książ Castle, Wałbrzych, Poland.
- PIETRIKOVÁ, A.: Study of Die Attachment on DBC substrates. Diagnostika ´16 - Conference on Diagnostics in Electrical Engineering - CDEE 2016, September 6-8, Pilsen, Czech Republic.

8.3. Competitions and Rewards

- ROVENSKÝ, T.: Excellent Poster Award for Young Scientists for the paper: Influence of accelerating ageing on LTCC and PCB substrates' dielectric properties in GHz area, 39th International Spring Seminar on Electronics Technology, Pilsen, Czech Republic, 21. 05. 2016.
- SAMUEL, Ž.: Excellent Poster Award for Young Scientists for the paper: Development of planar inductive sensor for proximity sensing based on LTCC, 39th International Spring Seminar on Electronics Technology, Pilsen, Czech republic, 21.5.2016.
- LUKÁCS, P.: SES Award for the Best Presentation in Section EEE for the

article: Analysis of Layers Based on Silver Nanoparticles Realized by Inkjet Printing Technology, 16th Scientific Conference of Young Researchers, Herlany, Slovakia, 17.5.2016.

- ROVENSKÝ, T.: Dean's Award for the Best Presentation in Section EEE for the article: Analysis of high frequency elements from the view of different materials and technologies applications', 16th Scientific Conference of Young Researchers, Herlany, Slovakia, 17.5.2016.

9 PUBLICATIONS

9.1. Textbooks

1. PIETRIKOVÁ, A. - ĎURIŠIN, J.: Vybrané kapitoly z technológií v elektronike. 1. vyd - Košice : Technická univerzita - 2016. - 151 pp. - ISBN 978-80-553-2617-7

9.2. Current Journals

1. PIETRIKOVÁ, A. - LUKÁCS, P. - JAKUBECZYOVA, D. - BALLOKOVA, B. - POTENCKI, J. - TOMASZEWSKI, G. - PEKAREK, J. - PRIKRYLOVA, K. - FIDES, M.: Surface analysis of polymeric substrates used for inkjet printing technology. In: Circuit World. Vol. 42, no. 1 (2016), p. 9-16. - ISSN 0305-6120
2. RUMAN, K. - PIETRIKOVÁ, A. - GALAJDA, P. - VEHEC, I. - ROVENSKÝ, T. - KMEC, M.: A new approach to construction of extended kit for M-Sequence UWB sensor system based on LTCC. In: Microelectronics International. Vol. 33, no. 3 (2016), p. 130-135. - ISSN 1356-5362
3. ROVENSKÝ, T. - PIETRIKOVÁ, A. - VEHEC, I. - KMEC, M.: Influence of various multilayer LTCC systems on dielectric properties' stability in GHz frequency range. In: Microelectronics International. Vol. 33, no. 3 (2016), p. 136-140. - ISSN 1356-5362
4. MICHALIK, Š. - ĎURIŠIN, J. - BALGA, D. - SAKSL, K. - ĎURIŠIN, M. - DRAKOPOULOS, M.: In situ HEXRD study of a Ca61Al39 metallic glass. In: Journal of Alloys and Compounds. Vol. 687 (2016), p. 188-196. - ISSN 0925-8388

9.3. Journals registered in Web of Science or SCOPUS

1. LUKÁCS, P. - PIETRIKOVÁ, A.: Nano-ink Drops' Behavior on the Polymeric Substrates' Surfaces, 2016. In: Periodica Polytechnica Electrical Engineering and Computer Science. Vol. 60, no. 4 (2016), p. 206-210. - ISSN 0324-6000
2. ŽUK, S. - PIETRIKOVÁ, A. - VEHEC, I.: LTCC Based Planar Inductive Proximity Sensor Design, 2016. In: Periodica Polytechnica Electrical Engineering and Computer Science. Vol. 60, no. 4 (2016), p. 200 - 205. - ISSN 2064-5260

9.4. Journals

1. KARDOŠ, S. - OLEJÁR, J.: Snímanie dynamiky pohybu na báze MEMS IMU, 2016. In: ElectroScope. Vol. 2016, no. 2 (2016), p. 1-4. - ISSN 1802-4564
2. KARDOŠ, S.: Power management mikrokontrolérových aplikácií, 2016. In: DPS Elektronika od A do Z. no. 5 (2016), p. 30-32. - ISSN 1805-5044
3. KOVÁČ, O. - MIHALÍK, J.: Tvarovanie 3R modelu ľudskej hlavy pomocou steroskopického snímania. In: Elektrorevue. Vol. 18, no. 1 (2016), p. 15-20. - ISSN 1213-1539

4. DRUTAROVSKÝ, M. - KOCUR, D. - PETURA, O. - FORTES, J. - SLOVÁK, S. - LABAN, M. - GALAJDA, P. - PIETRIKOVÁ, A. - KAŽIMÍR, P. - ŠVECOVÁ, M.: Embedded Sensor Node for UWB Radar Network based Short-Range Tracking of Moving Persons, 2016. In: International Scientific Herald. Vol. 12, no. 1 (2016), p. 240-250. - ISSN 2218-5348
5. LUKÁCS, P. - PIETRIKOVÁ, A.: Technológia InkJet Printing – 2. časť Používané materiály, 2016. In: DPS. Vol. 7, no. 1 (2016), p. 34-38. - ISSN 1805-5044
6. LUKÁCS, P. - PIETRIKOVÁ, A.: Technológia InkJet Printing – 3. časť Oblasti aplikácie, 2016. In: DPS. Vol. 7, no. 2 (2016), p. 45-49. - ISSN 1805-5044
7. CABÚK, P.: Vplyv umiestnenia chladiča na jeho tepelný odpor, 2016. In: DPS : Elektronika od A do Z. Vol. 7, no. 1 (2016), p. 28-29. - ISSN 1805-5044
8. LIVOVSKÝ, Ľ.: Obvodové riešenie merania teploty pomocou termočlánkov, 2016. In: DPS Elektronika od A do Z. No. 4 (2016), p. 67-69. - ISSN 1805-5044
9. KARDOŠ, S. - PIETRIKOVÁ, A.: Evaluation of motor oil characteristics and degradation factors for possibilities of continuous diagnostics, 2016. In: Acta Electrotechnica et Informatica. Roč. 16, č. 2 (2016), s. 20-24. - ISSN 1335-8243
10. LUKÁCS, P. - PIETRIKOVÁ, A. - POTENCKI, J. - TOMASZEWSKI, G.: The Deposition Process Optimization By Controlling of the Piezo Elements in the Print Head, 2016. In: Acta Electrotechnica et Informatica. Roč. 16, č. 3 (2016), s. 14-19. - ISSN 1338-3957
11. BALOG, P. - JURČIŠIN, M. - SLOSARČÍK, S.: Mikroelektromechanické systémy, 2016. In: Posterus. Roč. 9, č. 4 (2016), s. 1-9. - ISSN 1338-0087
12. BALOG, P. - SLOSARČÍK, S.: Rehabilitácia dolných končatín, 2016. In: Posterus. Roč. 9, č. 6 (2016), s. 1-6. - ISSN 1338-0087
13. BALOG, P. - JURČIŠIN, M. - SLOSARČÍK, S.: Technológie 3D integrácie systémov, 2016.In: Posterus. Roč. 9, č. 10 (2016), s. 1-9. - ISSN 1338-0087
14. KOVÁČ, O. - MIHALÍK, J. - ČAJKO, P.: Obrazové textúry a ich popisovanie. In: Posterus. Roč. 9, č. 3 (2016), s. 1-8. - ISSN 1338-0087
15. KOVÁČ, O. - MIHALÍK, J. - ČAJKO, P.: Algoritmus popisovania obrazových textúr v priestore DWT. In: Posterus. Roč. 9, č. 7(2016), s. 1-9. - ISSN 1338-0087
16. CABÚK, P.: Presnosť nástroja HyperLynx Thermal v inžinierskej praxi, 2015. In: DPS : Elektronika od A do Z. Vol. 6, no. 5 (2015), p. 26-28. - ISSN 1805-5044
17. CABÚK, P. - VEHEC, I.: Využitie softvéru FloEFD pri optimalizácii technologického procesu, 2015.In: DPS: Elektronika od A do Z. Vol. 6, no. 6 (2015), p. 28-29. - ISSN 1805-5044
18. JURČIŠIN, M. - SLOSARČÍK, S. - BALOG, P.: Trends in Technology of 3D Integration, 2015.In: Transactions of the Universities of Košice. Č. 2 (2015), s. 7-14. - ISSN 1335-2334
19. KOVÁČ, O. - LUKÁCS, P. - PIETRIKOVÁ, A.: Software tool for scripting and image processing applied in jetlab inkjet printers, 2015.In: Acta Electrotechnica et Informatica. Roč. 15, č. 4 (2015), s. 17-21. - ISSN 1335-8243

9.5. Other publications

Publication Type	Conferences		Other
	Abroad	Home	
Number	12	8	2