

# List of Services Offered by the Faculty of Electrical Engineering, University of Žilina

## Research and Development Activities

- active filters for elimination of negative effects of semi-conductor converters to electro-energetic system; control systems for electric drives, control systems for power electrical engineering, static converters based on resonance principle (KVES)
- analysis and simulations of the electromagnetic field by numerical means, the design and optimization of electromagnetic devices (KTEBI)
- research and development of means for non-destructive evaluation of materials using electromagnetic methods (KTEBI)
- research of the electromagnetic field effects on living organisms (KTEBI)
- research for biomedical applications - sensors, signal processing and analyses, modelling of physiological processes (KTEBI)
- optimisation and regulation of electrical equipments, with respect to energetic aspects and ecological load for environment, determining lifetime and the stage of aging of binding insulation for electric machines in real time (KMAE)
- research in the field of industrial automation of technological processes, MES and SCADA/HMI systems; synthesis of complex control algorithms based on sequential control (KME)
- research in the field of intelligent multi-robotic and mechatronic systems (KME)
- reconfigurable logical applications with FPGA (KME)
- analysis and diagnostics of electronic systems using image processing, analysis of integrated circuits (elements, chips) (KME)
- analysis and simulation of thermal field in multi-physical environment COMSOL (KME)
- research and development in the field of sophisticated technologies and rapid prototyping of technical equipment based on mechatronic principles (KME)
- research, development and testing of magnetisation and demagnetisation technical equipments for the field of manufacturing technologies (KME)
- analysis of thermo-vision image, image processing and archiving in biomedicine (KME)
- development of suitable techniques for study of mechanical, electrical and optical properties of materials and structures (KF)
- development of methodologies of wave imaging – acoustic microscopy (KF)
- analysis and synthesis of protocols system for communication systems with a special assortment of services, analysis and synthesis of systems with a defined level of safety (KRIS)



- analysis and synthesis of information systems, analysis and synthesis of modern railway safety-related systems, elaboration of project documentation in the field of protection of persons and property, and in the field of road traffic control (KRIS)
- research, studies, regulations, consultations in the field of intelligent transport systems (KRIS)
- analysis of mathematical models in the field of material research (IAS)
- diagnostics of optical properties of solid substance thin-layers (IAS)
- investigation and optimization of optical properties of thin-layers for thin-film solar cells and for hybrid electronics (IAS)
- automated systems of heliostat turning based on locally defined astronomic calculations, control and operating with the use of DC commutator and step motors (IAS)
- solution of heliotechnical equipment and system solutions in the field of concentration solar energetics, simulation, modelling, measurement of intensity of solar radiation, practical verification of conversion thermo-mechanical converters (IAS)
- telecommunication and radio-communication systems, networks and services (KTaM)
- development of applications with multimedia contents (KTaM)
- expertises in the field of optimizing structures of new generations telecommunication networks (KTaM)

## Training and Courses

- production of audiovisual courses and other audiovisual materials according to customer requirements (KTaM)
- negative effects on electricity supply system, dispatcher control of electricity supply systems, problems of reactive power, protections of buried equipment against electrochemical corrosion, supply of electrical traction equipment (KVES)

- training and courses for the field of LANs, MANs, WANs and their applications; industrial and information networks (KME)
- training and courses in design and programming of industrial automats Siemens, Rockwell Automation and Schneider Electric (KME)
- training and courses in the field of mechatronics and mechatronic systems (KME)
- training and courses in the field of sophisticated technologies, design of virtual parametric models and rapid prototyping of technical equipments models based on mechatronic principles (KME)
- training courses and education in the fields: PLC programming (Siemens, Rockwell Automation & Bernecker & Reiner), information technologies oriented to secure communications, technical means for protection of property, analysis, synthesis, design and management of information systems in transport domain and technological processes (KRIS)
- safety assessment of safety-related control systems for industrial applications and railway interlocking & signalling systems (KRIS)
- railway interlocking and signalling systems – control algorithms and operation (KRIS)
- usage of safety PLCs to control safety-critical control process (KRIS)
- re-construction of driving railway vehicles (KVES, KMAE)
- electrical drives and control of traction vehicles, traction calculations, design and dimensioning of urban mass transport, design of electric regulation drives with DC and AC engines, design of electric traction drives with asynchronous motors, repairs and innovations of electric drives (KVES)
- the field of diesel-electric vehicles, electric power transfer (KVES, KMAE)
- power semiconductor structures and elements - diodes, thyristors, bipolar and unipolar transistors, combined structures (KVES)
- IGBT, MCT and IGCT, power semiconductor converters – rectifiers, inverters, DC and AC converters, AC regulators, cycloconverters (KME)
- power semiconductor systems (switched supply sources, induction heating), active filters and power factor compensators, control systems with monolithic microcomputers and DSP-processors (KME)
- telecommunication and radio-communication systems, networks and services (KTaM)
- optical communication systems and networks (KTaM)
- digital signal processing (KTaM)
- training oriented to basic as well as advanced problems of computer technique (KF)
- requalification courses in the field of car electrical engineering (KMAE)
- quality management systems according to requirements of the standards ISO 9000,

- training of internal auditors in the sense of standard ISO 19011 (KVES)
- Microsoft operation systems, Microsoft Office packet of programmes, Internet

#### **Consultation Activities in the Fields**

- design of special measurements of physical quantities and results interpretations (KF)
- next generation networks based on convergence of new information and communication technologies (KTaM)
- private communication networks (KTaM)
- mobile and wireless networks (KTaM)
- analogue and digital television, audio, video and data services (KTaM)
- consulting and software development in the field of non-destructive evaluation of materials and technical equipments (KTEBI)
- modelling of access networks for audio, video and data services (KTaM)
- audio, video and data services (KTaM)
- optical communication systems and networks (KTaM)
- digital signal processing, analysis of audio and video signals (KTaM)
- sound distribution, evaluation of space acoustics (KTaM)
- consultancy and expertise activity in the analysis and numerical simulations of the electromagnetic field (KTEBI)
- design and optimization of electromagnetic devices (KTEBI)
- consultant and expertise activities in the field of secure communications and safety-critical control systems, analysis, synthesis and safety assessment of control systems having a defined level of safety, safety of information systems, preparation of project documentation in the field of road traffic control (KRIS)
- design of concept, analysis, synthesis, project works and management of information systems, solution of problems of railway operation resulting from railway interlocking and signalling equipment (KRIS)
- negative effects on electricity supply systems, EMC - harmonic components, asymmetry of electricity supply systems, total power factor, flicker (KVES, KME)
- dispatcher control of electricity supply systems, problems of reactive power, protections of buried equipment against electrochemical corrosion, supply of electric traction equipment (KVES)
- technical translations (electrical engineering – low power) from English, German and Spanish, translations to English and German (KTEBI)
- the field of small and medium enterprises – virtual institution, pedagogical supplementary education, didactics of teaching technical courses in secondary technical schools (KMAE, KTEBI)
- expert services in mechatronics (KME)

- consulting services in the field of mechatronics and mechatronic systems (KME)
- analysis of mathematical – statistical and probabilistic models (IAS)
- the field of materials for thin-layer solar cells (IAS)
- concentration solar energy systems, general consultations in solving and using of renewable energy sources (IAS)



- Microsoft Office SW applications (Word, Excel, Power Point) aimed at data processing and evaluation, preparation of Power Point presentations, design of www pages (IAS)

#### **Standardisation Activities**

- electro-energetic systems and equipment, electromagnetic compatibility – EMC, power supply of electric traction equipment, electrical installations, electrical traction, electric machines, drives, traction vehicles, power semiconductor systems (KVES, KME)
- consultations to a set of standards ISO 9000 and literature dealing with Quality Management (KVES)
- systems for protection of persons and property: alarm systems, fire alarm systems, network applications, transport technologies in highway network, railway signalling systems (KRIS)
- mobile radio networks, access networks, ATM, SDH, radio and TV broadcasting, radio-relay and satellite communication, data transmission networks (KTaM)

#### **Lifelong Learning Courses**

- railway interlocking and signalling, applications of processor-based techniques in railway interlocking and signalling systems (KRIS)
- information technologies concentrated on wideband and multimedia networks, SDH hierarchy of transmission networks, safe/secure communications (KRIS)
- safety technician, specialisation Technical means for protection of property, assessment of modern electronic alarm systems (KRIS)
- design of concept, analysis, synthesis, designing and management of information systems for the field of transport, telecommunications and technological processes (KRIS)
- digital networks with integrated ISDN networks (KTaM)
- technologies in access networks (KTaM)
- technologies in transport networks (KTaM)
- next generation networks (KTaM)
- services of next generation networks (KTaM)
- multimedia technology and networks (KTaM)
- photographic and film equipments (KTaM)
- creative photography and its computer processing (KTaM)
- technical and creative video processing (KTaM)
- converged networks and next generation networks (KTaM)
- IP networks (KTaM)
- mobile radio networks (KTaM)
- television, digital TV and radio broadcasting (KTaM)
- satellite systems and services (KTaM)
- mechatronics and mechatronic systems (KME)
- light and heat technique (KME)

#### **Expertises and Design Works**

- electric controlled drives with DC and AC electric motors, calculations of rotating and static electric machines, control and operation of a group of electric drives, active filters and compensators of power factor (KVES, KME)
- assessment of connectivity of new electric energy sources in distribution networks (KVES)
- assessment of the electricity quality in connection points of sources or loads (KVES)
- design work in the system RUPLAN (KVES)
- design works in electrical engineering (KMAE)
- design, construction and realisation of functional prototypes of non-conventional apparatuses (KF, KME)
- design, construction and realisation of functional prototypes of mechatronic and biomedical systems (KME, KTEBI)
- analyses and syntheses of information systems, preparation of project documents in the field of protection of persons and property, preparation of project documents in the field of road traffic control (KRIS)
- analysis, design and safety assessment of railway interlocking and signalling systems (KRIS)
- next generation networks (KTaM)
- optical communication systems and networks (KTaM)
- computer networks (KTaM)
- mobile and wireless radio networks (KTaM)
- radio-relay systems and networks (KTaM)
- satellite systems (KTaM)
- radio networks (KTaM)
- analogue and digital TV and cable TV distributions (KTaM)
- electro-acoustic, sound distribution (KTaM)

- concept solution and technical preparation of reconstructions and modernisation of locomotives of independent traction, concept and technical solution of diesel-electric traction, design of electric circuits of diesel-electric locomotives (KVES, KMAE)
- design and experimental verification of traction and auxiliary drives of DE transmissions (KMAE)
- design and production of study tools (KF)

#### **Development of Application SW**

- computer sensing and processing of electrical and non-electrical signals and computer-based modelling and simulation of physical processes (KF, KME)
- traction calculations for design organisations, travelling times, tachographs, simulations of traction vehicles, dynamic and static simulations of operation and control of electric machines, dynamic and static simulations of controlled drives with driving machines (KVES)
- SW in the field of power semiconductor systems (KME),
- SW for measurement of electrical quantities and database systems (KMAE, KTEBI)
- signal processing and analysis for biomedical applications (KTEBI)
- location-based services, wireless networks, TKR (KtAM)
- design of 3D-virtual models of electrical transmissions, design of sophisticated virtual models of railway vehicles (KME)
- development of SW for computer processing of physical measurements and simulation of physical processes (IAS)

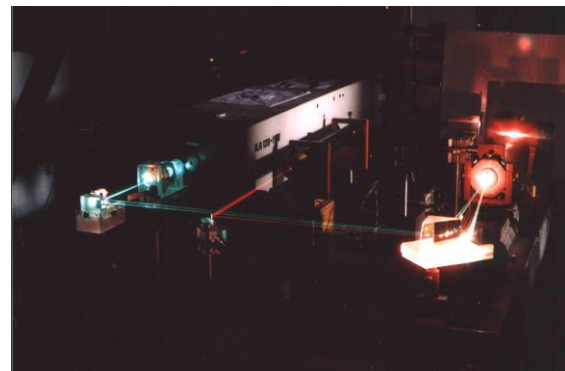
#### **Engineering**

- means of digital data processing, 8-bit microcontrollers INTEL 'C 51, 16-bit microcontrollers SIEMENS SAB 80C166, C167 (KVES)
- digital signal processor TI TMS320C25, measurement microcontroller TI MSP 430, digital signal processor AD 2101 (KVES)
- automated design of electrical circuits (KVES)
- design of SW for computer-based processing of physical measurements and simulation of physical phenomena (IAS)
- radio networks, control of radio sources (KtAM)
- interactive cable TV distributions (KtAM)
- development of specialized electronic systems, including prototyping (KtAM)

#### **Tests and Measurements**

- negative effects on electricity supply system - harmonic components, asymmetry, power

- factor, ground current fields, stray currents, potential of buried equipments (KVES)
- measurements on supply stations, traction lines, transition phenomena, measurements on electric machines up to a power of 30 kW (KVES)
- loading tests of electric machines using dynamometer (up to a power of 50 kW), measurement of torque characteristics of combustion engines, measurement and evaluation of accumulator batteries (KVES)
- non-destructive evaluation of conductive materials using eddy currents (KTEBI)
- measurements of time dependences and integral values of electric quantities up to 1 kV, 100 A, and up to frequency of 500 MHz (KME)
- thermovision measurements according to the customer requirements (KMAE)
- diagnostics of electric machines according to the valid STN standards, possibilities of analysis of electric networks, experimental verification of technical parameters of transmission aggregates (KMAE)
- design and production of computer-controlled diagnostic systems of transformers (KMAE)
- diagnostics of solar panels on basis of thermal images processing (IAS)



#### **Physical Measurements**

- measurement of mechanical properties of materials by acoustics (ultrasound) methods – elastic modules, critical points, structural defects, residual deformations, crystallization state (KF)
- acoustic microscopy for the purpose of defectoscopy, monitoring of internal structure and non-homogeneity of materials (KF)
- measurement of dimensions and changes of dimensions using interferometric and diffractographic methods (KF)
- measurement of internal friction (viscosity) and surface tension of liquids (KF)
- measurement of thermal properties of materials – thermal conductance, thermal extensibility and thermal capacities of solid and liquid substances (KF)
- measurement of electrical characteristics of materials – electric resistance of high resistance substances (up to 10<sup>15</sup> Ωm),



electric permittivity and loss angle of materials in a wide frequency range (KF)

- check of homogeneity of electric conductance of high resistance materials, measurement of V-characteristics of semiconductor elements and determination of basic electric parameters of materials from galvanometric measurements (KF)
- measurement of optical properties of solid and liquid materials – refractive index, absorption coefficient, reflectivity coefficient (KF)
- measurement of basic parameters and physical properties of optical waveguides (optical fibres) (KF)
- measurement of light absorption coefficient of thin transparent layers (KF)
- determination of polarisation properties of light sources (KF)
- measurement of optical transmittance and reflectance properties of materials (ultraviolet, visible and infrared area), determination of refractive index and absorption coefficient of volumetric and thin-layered samples (IAS)

#### **Measurements in Telecommunications**

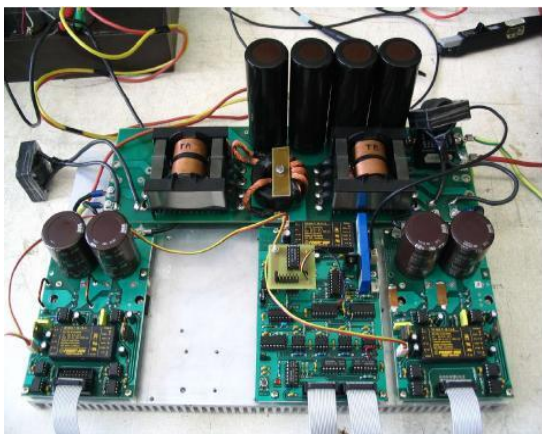
- measurement of intensity of electromagnetic field and interference (KTaM),
- measurement of acoustic parameters of closed spaces (KTaM),
- measurements of optical systems and analysis of spectrum in near infrared area (KTaM)

#### **Measurements in Digital Image Processing**

- image processing and analysis, calibration, filtration, image compression, measurements of objects (KME)

#### **Design of Printed Circuits Boards for Electronic Systems**

computer-based automated technology of design with manufacturing details: initial requirements specified by a customer, interconnecting of document plans, help with prototype realisation (KME)



#### **Implementation of Electronic Logical Systems**

- for programmable logical elements PLD, computer-based automated technology of realisation, development of non-standard interfaces for monolithic microcomputers (KME)
- realisation of reconfigurable electronic logical systems (KME)

#### **Development of Physical Culture**

- (in co-operation with Institute of Physical Education - ÚTV ŽU) skiing courses and water touring by water (IAS)

#### **Contact Address of the FEE:**

Faculty of Electrical Engineering  
University of Žilina  
Univerzitná 8215/1  
SK-010 26 Žilina, Slovakia  
Phone: +421-41-513 2051  
Fax: +421-41-513 1515  
E-mail: dean@fel.uniza.sk  
WWW: <http://fel.uniza.sk>



#### **Contact Addresses of the FEE Departments:**

(KME) Department of Mechatronics and Electronics  
Phone: +421-41-5131601, fax: +421-41-5131524, e-mail: kme@fel.uniza.sk

(KMAE) Department of Measurement and Applied Electrical Engineering  
Phone: +421-41-5132129, fax: +421-41-5131515, e-mail: kmae@fel.uniza.sk

(KTEBI) Department of Electromagnetic and Biomedical Engineering  
Phone: +421-41-5132101, fax: +421-41-1515, e-mail: ktebi@fel.uniza.sk

(KVES) Department of Power Electrical Systems  
Phone: +421-41-5132151, fax: +421-41-5131518, e-mail: kves@fel.uniza.sk

(KF) Department of Physics  
Phone: +421-41-5132301, fax: +421-41-5131516, e-mail: ktf@fel.uniza.sk

(KRIS) Department of Control and Information Systems  
Phone: +421-41-5133301, fax: +421-41-513 1515, e-mail: kris@fel.uniza.sk

(KTaM) Department of Telecommunications and Multimedia  
Phone: +421-41-5132202, fax: +421-41-5131520, e-mail: ktam@fel.uniza.sk

(IAS) Institute of Aurel Stodola, Faculty of Electrical Engineering, University of Žilina, kpt. J. Nálepku 1390, 031 01 Liptovský Mikuláš, Slovakia, Phone: +421-44-5620076, +421-41-513 1480, e-mail: mullerova@lm.uniza.sk

## Reference list of projects recently solved at the FEE in 2013

### *Projects of European Frame Programmes:*

Projects of 7th Frame Programme	Coordinator from FEE
244749 European Science and Technology in Action Building Links with Industry, Schools and Home (ESTABLISH)	Ivo Čáp, KTEBI
<b>EUREKA projects</b>	
EI 6752 R&D For Integrated Artificial Intelligent System For Detecting The Wildlife Migration "DETECTGAME"	Róbert Hudec, KTaM
<b>COST projects</b>	
Action TD1001: Novel and Reliable Optical Fibre Sensor Systems for Future Security and Safety Applications (OFSeSa)	Daniel Káčik, KF
COST IC 1003: European Network on Quality of Experience in Multimedia Systems and Services (QUALINET)	Peter Počta, KTaM
Action IC 1106: Integrating Biometrics and Forensics for the Digital Age	Roman Jarina, KTaM
Action IC 1304: Autonomous Control for a Reliable Internet of Services (ACROSS)	Peter Počta, KTaM
Action TU 1302: Satellite Positioning Performance Assessment for Road Transport (SaPPART)	Peter Brída, KTaM
<b>TEMPUS Projects</b>	
530632-TEMPUS-1-2012-1-SE-TEMPUS-JPCR: EU-EG-JO Joint Master Programme in Intelligent Transport Systems	Peter Brída, KTaM
<b>CEEPUS II projects</b>	
From preparation to development, implementation and utilisation of joint programs in study area of Production Engineering – contribution to higher flexibility and mobility of students in central European region (CII-SK-0030-06-1011)	Fedor Kállay, KME
<b>Other international projects</b>	
P-103-0007/08: Analysis of heat fields in power electronic systems	Pavol Špánik, KME
ETSI STF 436 on Adaptation of the ETSI QoS Model to Better Consider Results from Field Testing	Peter Počta, KTaM
ETSI STF 453 on Update of IMS NNI and IMS&EPC Test Specifications to 3GPP R10 and RCS 5.0	Peter Počta, KTaM
2/2012: Actualisation and extension of NEXUS system product portfolio	Karol Rástočný, KRIS
1/2013: Safety appraisal of track interlocking device VEAH-11	Karol Rástočný, KRIS
Safety appraisal of railway-crossing interlocking system RLC23	Karol Rástočný, KRIS
02-1-1097-2010/2015: Study of spin effects in few nucleon systems	Marián Janek, KF
Z-14-101/0001-1404 00: ChemLog T&T Tracking and Tracing - Chemical Logistic Cooperation in Central and Eastern Europe	Peter Vestenický, KRIS
OP VK CZ.1.07/2.2.00/15.0113: Innovation of subject „Measurement and control technology“ at the FEI, VŠB-TU Ostrava	Michal Gála, Branko Babušiak, KTEBI
RRC/05/2013: Support of science and research in the Moravian-Silesian region 2013 DT 1 - International research teams	Michal Gála, Branko Babušiak, KTEBI
PROJECT of EUROPEAN PHYSICAL SOCIETY INTERNATIONAL PHYSICS MASTERCLASSES 2013	Ivan Melo, KF

### *National SRDA projects:*

Project Number	Name of the project	Coordinator
APVV-0888-11	Research of new passivation processes of Si-based structures	RNDr. Emil Pinčík, CSc. (Institute of Physics, Slovak Academy of Sciences, Bratislava); From FEE: doc. RNDr. Jarmila Müllerová, PhD., IAS
APVV-0096-11	Defects role in organic semiconductors for solar cells	Ing. Vojtech Nádaždy, CSc. (Institute of Physics, Slovak Academy of Sciences, Bratislava); From FEE: doc. RNDr. J. Müllerová, PhD., IAS
APVV-0025-12	Mitigation of stochastic effects in high-bitrate all-optical networks	doc. RNDr. J. Müllerová, PhD., IAS

APVV-0050-11	Strongly interacting matter in extreme conditions (SIMEX)	RNDr. Štefan Olejník, DrSc. (Institute of Physics, Slovak Academy of Sciences, Bratislava) From FEE: RNDr. Ivan Melo, PhD., KF
APVV-395-12	Photonic structures for integrated optoelectronics	doc. Ing. Dušan Pudiš, PhD., KF
APVV-0703-10	Analysis and diagnostic measurements of power transformers using by sweep frequency response analysis	prof. Ing. Ján Michalík, PhD. From FEE: Ing. Martin Brandt, PhD., Ing. Róbert Seewald, doc. Ing. Dagmar Faktorová, PhD., KMAE
SK-RO-0008-12	Resonant ultrasound spectroscopy - application for non-destructive testing of biomedical refunds	Ing. František Nový, PhD. (FMI, ŽU) From FEE: doc. Ing. Dagmar Faktorová, PhD., KMAE
APVV-0138-10	Research and development of the small power drives with two-phase motors	Prof. Ing. Pavel Zásalický, PhD., TUKE From FEE: prof. Ing. Branislav Dobrucký, PhD., KME
APVV-0314-12	Research and development of new generation of power supplies based on converters with high power density, high efficiency, low EMI and circular energy	prof. Ing. Branislav Dobrucký, PhD., KME
APVV-0433-12	Research and Development of Intelligent System for Wireless Energy Transfer in Electromobility Application	prof. Ing. Pavol Špánik, PhD., KME
APVV-0349-10	Towards electromagnetic induction based methods to meet their true potential in non-destructive monitoring of conductive structures	doc. Ing. Ladislav Janoušek, PhD., KTEBI
SK-RO-0011-12	Enhancing diagnosis of partially conductive cracks in eddy-current non-destructive evaluation	doc. Ing. Ladislav Janoušek, PhD., KTEBI
SK-RO-0028-12	Switched reluctance machine analysis in automotive applications	doc. Ing. Pavol Rafajdus, PhD., KVES

**National grant projects VEGA and KEGA:**

Project Number	Name of the project	Coordinator
VEGA 1/0453/12	Study of interactions between motor vehicle, traffic flow and roadway	prof. Ing. Aleš Janota, PhD., EurIng., KRIS
VEGA 1/0388/12	Quantitative safety integrity appraisal of control systems for railway applications	prof. Ing. Karol Rástočný, PhD., KRIS
VEGA 2/1271/12	Study of the influence of the degradation effects in the physical layer of the high-speed optical networks on the transport mechanisms	doc. RNDr. Jarmila Müllerová, PhD., IAS
VEGA 2/0076/12	Investigation of interaction of aqueous HCN solution with more types of Si-based structures	RNDr. Emil Pinčík, CSc. (Institute of Physics, Slovak Academy of Sciences, Bratislava); From FEE: doc. RNDr. Jarmila Müllerová, PhD., IAS
VEGA 1/0853/13	Research of the microstructural, electrical and optical properties of the semiconductor/dielectric systems	RNDr. Stanislav Jurečka, PhD., IAS
VEGA 1/0457/12	Strongly interacting matter in nuclear collisions and compact stars	doc. RNDr. Boris Tomášik PhD., UMB Banská Bystrica From FEE: RNDr. Ivan Melo, PhD., KF
VEGA 2/0045/13	Sensitivity of liquid crystals with nanoparticles to external magnetic field	doc. RNDr. Kopčanský, CSc. UEF SAV Košice; From FEE: prof. RNDr. Peter Bury, CSc., KF
VEGA 1/0624/13	Analyze of insulation state of oil distribution transformers with respect to investigation of adverse effects	doc. RNDr. Jozef Kúdelčík, PhD., KF
VEGA 1/0528/12	Research and development of optofluidic fibers for sensor and photonic applications	doc. Mgr. Ivan Martinček, PhD., KF
VEGA 1/1058/11	NSOM lithography and interference lithography as an advanced method for the preparation of the photonic structures and optoelectronic devices with photonic structures	doc. Ing. Dušan Pudiš, PhD., KF

VEGA 1/0846/13	Design and optimization of methods and materials for treatment of tumour diseases by applying electromagnetic field	doc. Ing. Dagmar Faktorová, PhD., KMAE
VEGA 1/0743/12	Gigacycle fatigue properties of nanostructured materials	prof. Ing. Otakar Bokůvka, PhD. (FMI ŽU); From FEE: doc. Ing. Dagmar Faktorová, PhD., KMAE
VEGA-1/0704/12	Radio resources management improvement in wireless ad hoc and mesh networks	prof. Ing. Vladimír Wieser, PhD., KTaM
VEGA-1/0394/13	Research of mobile terminals localization by means of modular localization systems	doc. Ing. Peter Brída, PhD., KTaM
VEGA- 1/0705/13	Image elements classification for semantic image description	doc. Ing. Róbert Hudec, PhD., KTaM
VEGA 1/0355/11	Optimal control techniques for lowering of alternating electric drives losses	prof. Ing. Ján Vittek, PhD., KVES
VEGA 1/0940/13	Research and development of switched reluctance machines for automotive applications	doc. Ing. Pavol Rafajdus, PhD., KVES
VEGA 1/0927/11	Research of the new approaches to monitoring and evaluation of biomaterials by electromagnetic methods	prof. Ing. Klára Čápková, PhD., KTEBI
VEGA 1/0765/11	Research on application possibilities of eddy currents non-harmonic excitation in quantitative non-destructive evaluation of conductive materials	doc. Ing. Ladislav Janoušek, PhD., KTEBI
VEGA 1/0943/11	Research of adaptive multi-tank power system for renewable energy sources	prof. Ing. Pavol Špánik, PhD., KME
VEGA 1/0184/13	Research of indirect computing algorithms and tools for evaluation of power loss in power electronic device's component with support of physical model simulation postprocessing	Ing. Drgoňa Peter, PhD., KME
KEGA 022ŽU-4/2013	Discovering the world of particles	RNDr. Ivan Melo, PhD., KF
KEGA035ŽU-4/2012	Forming of physical concepts using videoanalysis and videomeasurements with the aim to popularize physics and make it more attractive	doc. PaedDr. Peter Hockicko, PhD.
KEGA 002KU-4/2011	Development of scientific literacy in university preparation of students of pre-school and elementary school pedagogy	PaedDr. Ivana Rochovská, PhD., KU Ružomberok; From FEE: doc. PaedDr. Peter Hockicko, PhD., KF
KEGA 010ŽU-4/2013	Modernisation of education technologies and methods with focus on the area of robotics	prof. Ing. Aleš Janota, PhD. Eurlng, KRIS
KEGA 024 ŽU 4-2012	Modernisation of education technologies and methods with focus on the area of cryptology for safety critical applications	prof. Ing. Mária Franeková, PhD., KRIS

**Projects of the European Structural Funds:**

Project Number	Name of the project	Coordinator
ITMS 26220120046	Centre of excellence of power electronics systems and materials for their components II.	prof. Ing. Pavol Špánik, PhD., KME
ITMS 26110230079	Innovation and internationalization of education – instruments to enhance quality of the University of Žilina in European Education Area	PhDr. Renáta Švarcová, ŽU
ITMS 26220220078	Research of high-economic components of electric drive systems of driving traction vehicles and urban mass transportation vehicles	Ing. Martin Brandt, PhD., KMAE
ITMS 26110230107	Modern teaching methods of control and diagnostic systems of motor vehicles	doc. Ing. Róbert Labuda, PhD., FMI ŽU
ITMS 26110230005	Flexible and attractive study at the University of Žilina for the labour market's requirements and for the knowledge society	PhDr. Renáta Švarcová, ŽU
ITMS 26110230060	Development of quality culture at the University of Žilina based on European standards for higher education	PhDr. Renáta Švarcová, ŽU
ITMS 26110230052	Increasing the competitiveness of technical study programs reflecting the current needs of business practice	prof. Ing. Eva Tillová, PhD., FMI ŽU; From FEE: prof. Ing. M. Pokorný, PhD.



ITMS 26220120028	Centre of excellence for intelligent transport systems and services I.	prof. Ing. Karol Matiaško, FMI ŽU; From FEE: prof. Ing. Juraj Spalek, KRIS
ITMS 26220120050	Centre of excellence for intelligent transport systems and services II.	prof. Ing. Karol Matiaško, PhD., FMI ŽU; From FEE: prof. Ing. Juraj Spalek, KRIS
ITMS 26220220089	New measurement methods for physical dynamical parameters and interactions of traffic stream motor vehicles and roadway	prof. Ing. Aleš Janota, PhD., Eurlng, KRIS
ITMS 26220220169	Transport telematic systems research centre	Ing. Rastislav Pirník, PhD., KRIS
ITMS 26110230004	Systemisation of advanced technology and knowledge transfer between industrial sphere and university environment	prof. Dr. Ing. Milan Sága, FMI ŽU
ITMS 26220220184	Science park of the University of Zilina	doc. Ing. Michal Zábovský, PhD., FMI ŽU
ITMS 26110230090	Quality educations with support of innovation forms, excellent research and international cooperation – successful graduates for needs of praxis	PhDr. Renáta Švarcová, ŽU
IMTS 2622020220183	Research center of University of Zilina	doc. Ing. Branislav Hadzima, PhD.
ITMS 26220220153	Competence centre for research and development in diagnosis and therapy of carcinoma	doc. MUDr. Dušan Mištuna, PhD., JLF UK, Martin; From FEE: Ing. Miroslav Benčo, PhD., KTaM
ITMS 2621120021	Modernization of research infrastructure in the fields of electrical engineering, electrical materials and ICT	Ing. Ivana Brídová, PhD., FEE
ITMS 22420320001	Interregional mobile television DVB–H	Ing. Mária Bátorová-Prekopová, ext.
ITMS 26220220022	Design of new diagnostic algorithm for selected tumour affections	doc. RNDr. Peter Račay, PhD., JLF UK, Martin
ITMS 26220220134	Research on technologies and products for intelligent clothing and technical textiles	Ing. Ján Šesták , VÚTCH-CHEMITEX, spol. s r.o.; From FEE: Ing. Michal Gála, PhD., KTEBI
ITMS 26250120046	Infrastructure support to improve the conditions of the educational process	prof. RNDr. Milan Malcho, PhD. , FMI ŽU; From FEE: doc. Ing. Milan Trunkvalter, PhD., KTaM
ITMS 26110230063	Human resources development with support of integrated information system for evaluation of scientific research results	prof. Ing. Ján Čelko, PhD., SvF ŽU
ITMS 26220220118	Development of optimal technology for analysis of limiting states of construction elements in contact	prof. Ing. Milan Žmindák, CSc.
ITMS 26220220121	Modifications and verification of surgical tools	prof. Ing. Radomila Konečná, PhD., FMI ŽU
ITMS 26220220156	Brokerage aviation centre for technology and expertise transfer into transport and transport infrastructure	prof. Andrej Novák, PhD., FPEDAS ŽU; From FEE: doc. Ing. Peter Brída, PhD., KTaM, doc. Ing. Alena Otčenášová, PhD., KVES
ITMS 26220220088	Applied research and development of innovative energy sources for ultra high pressure pulses	Ecoland s.r.o; From FEE: doc. Ing. Pavol Rafajdus, PhD, KVES
ITMS 26110230089	New measurement methods for physical dynamical parameters and interactions of traffic stream motor vehicles and roadway	Mgr. Helga Jančovičová, PhD., UIPŠ
ITMS 26220120034	Centre for experimental and clinical respirology II	doc. Ing. Miroslav Hrianka, PhD., KME
ITMS 26220220019	MKC ciliary kinetics measurement of respiratory tractus	doc. Ing. Miroslav Hrianka, PhD., KME
ITMS 26220220046	Infrastructure support to improve the conditions of the educational process	doc. Ing. Viera Poppeová, PhD., FMI ŽU; From FEE: Ing. Peter Šindler, KME
ITMS 22410320029	Cooperation between the University of Žilina and VSB-TU Ostrava on improving the quality of education and training of researchers in area of electrical engineering	doc. Ing. Alena Otčenášová, PhD., KVES

**Other national research projects:**

Project Number	Name of the project	Coordinator from FEE
052/12	Foundation Volkswagen Slovakia „Know the braking distance of your car“	doc. PaedDr. Peter Hockicko, PhD., KF
343/100/2013	Research of toll-system data utilisation	prof. Ing. Aleš Janota, PhD. Eurlng, KRIS
005ŽU-2/2013	Enhancing quality of key competences of graduates by internationalization of education based on common study programs	doc. Ing. Ladislav Janoušek, PhD., KTEBI

**Contract-based research activities:**

Number of contract	Customer	Coordinator from FEE	Title
P-103-0004/12	VÚD Žilina	doc. Ing. P. Vestenický, PhD.	Proposal of the implementation of system for oversight of transportation of excessive, oversized and hazardous cargo
P-103-0002/12	AŽD Prague	prof. Ing. K. Rástočný, PhD.	Report on appraisal of functional behavioural model of RBCC -2nd stage
P-103-0006/12	SIEMENS AG, Österreich	prof. Ing. K. Rástočný, PhD.	Overall appraisal of the Simis W SK system – point version phase 4.3 V10.3.11 – stage 2
P-103-0009/12	Power-en Bratislava	prof. Ing. J. Altus, PhD.	Connectivity in the energy market in the Slovak Republic
P-103-0007/11	Saller Invest, s.r.o.	prof. Ing. J. Altus, PhD.	Studies of the connectivity of photovoltaic power to the distribution system
P-103-0001/13	Pow-en, a.s.Bratislava	prof. Ing. J. Altus, PhD.	Analysis and the possibility of use of unplanned power flow in the power system in Slovak Republic
P-103-0002/13	Euroenergy s.r.o.Praha	prof. Ing. J. Altus, PhD.	Potential of the existing resource base in the electricity and heat in Slovak republic
P-103-0003/13	Scheidt & Bachmann Slovensko, s.o., BETAMONT, s.r.o. SIEMENS, s.r.o. ELTODO EG, a.s. AŽD PRAHA, s.r.o.	prof. Ing. J. Spalek, PhD.	Promotion of companies during the meeting of departments of power systems, cybernetics and informatics (advertising contracts)
P-103-0005/13	SEPS Bratislava	prof. Ing. J. Altus, PhD.	Calculation of connection capacities of sampling sites in the TS SR
P-103-0006/13	Thales Austria Wien	Ing. P. Nagy	Assessment of the system parts according to the national requirements
P-103-007/13	SEPS Bratislava	prof. Ing. J. Altus, PhD.	Reconfiguration in ES SR
P-103-0008/13	SEPS Bratislava	prof. Ing. J. Altus, PhD.	Processing of input data and analysis of photovoltaic power plants in the EC SR
P-103-0008/12	BEZ transformers Bratislava	Ing. M. Brandt, PhD.	Analysis of Transformers
P-103-0010/06	ŽU	Ing. K. Jurošková	Re-invoicing of electrical outlet from LM

**Contract-based non-research activities:**

Number of contract	Customer	Coordinator from FEE	Title
P-103-0004/13	Institute of Continuing Education	doc. Ing. R. Hudec, PhD.	Multimedia outputs according to the orders
P-103-0021/06	BEZ transformers Bratislava	Ing. M. Brandt, PhD.	Loan of the measuring equipment DOBLE
P-103-0010/07		Ing. D. Brunová	Rental of premises in LM - dormitory building
P-103-0007/12		Ing. D. Brunová	Rental of premises in LM - school building