

**DEPARTMENT OF RADIO AND ELECTRONICS**

<http://www.elf.stuba.sk/departments/kre/kre.html>

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**I. STAFF**

Professors	Prof. Ing. Igor Baláž, DrSc., Prof. Ing. Florián Makáň, PhD.
Associate Professors	Doc. Ing. Peter Hajach, PhD., Doc. Ing. Ján Hribík, PhD., Doc. Ing. Miloslav Hruškovic, PhD., Doc. Ing. Vladimír Kudják, PhD., Doc. Ing. Peter Kulla, PhD., Doc. Ing. Oldřich Ondráček, PhD., Doc. Ing. Miroslav Paško, PhD., Doc. Ing. Pavel Piš, PhD., Doc. Ing. Peter Podhoranský, PhD., Doc. Ing. Ivan Spudil, PhD.
Assistant Professors	Ing. Zdenko Brezovič, Ing. Elena Cocherová, PhD., Ing. Miroslav Hagara, Ing. Benedikt Hollý, PhD., Ing. Zuzana Krajčušková, Ing. Peter Kubinec, Ing. Marek Kukučka, Ing. Branislav Lojko, Ing. Marián Minárik, PhD., Ing. Jozef Petrek, PhD., Ing. Marek Polák, PhD., Ing. Anna Přibilová, PhD., Ing. Jozef Púčík, PhD., Ing. Pavol Zavarský, PhD.
Research Workers	Ing. Ján Bezek, PhD., Ing. Vladimír Bilík, PhD., Ing. Peter Fuchs, PhD., Ing. Milan Košťál, PhD., Ing. Fedor Lehocki
Technical Staff	Bohumil Frey, Ivana Prokopová, Gabriela Vránová (secretary), Edita Boďová
PhD. Students	Ing. Loránt Burián, Ing. Jozef Huska, Ing. Gabriel Kósa, Ing. Michal Lipovský, Ing. Stanislav Lovás, Ing. Michal Majchrák, Ing. Ján Zemanovič

**II. EQUIPMENT**

**II.1 Teaching and Research Laboratories**

- Laboratory of Electronic Networks, Devices and Measurements
- Laboratory of Analog Circuits and Systems
- Laboratory of Pulse Circuits
- Laboratory of Signals and Systems
- Laboratory of Electroacoustics
- Laboratory of Audio Processing
- Laboratory of Image Processing
- Laboratory of Medical Electronic Instrumentation
- Laboratory of Microwave Engineering
- Laboratory of Antennas and Wave Propagation
- Laboratory of Radio Receivers and Transmitters
- Laboratory of Electroacoustic Measurements
- Laboratory of Digital Signal Processing
- Laboratory of TV Systems
- Laboratory of Digital and Analog Circuits and Systems
- Laboratory of Electromagnetic Measuring Devices
- Laboratory of Diagnostics in Medicine
- Laboratory of Data Transmission Systems

## II.2 Special Measuring Instruments and Measuring Systems

- Six-Port Reflectometers and Automatic Impedance Matching System for High-Power Industrial Applications
- European Customer Training Centre – Texas Instruments (DSP TMS320C2xx, TMS370, TMS320C5x, TMS320C6xxx, MSP430)
- Precise Registration / Calibration Electricity Meter
- Precise Digital Network Analyzer and Standard Meter PEM 6711

## III. TEACHING

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

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

Electronic Devices and Circuits	(3rd, 4th sem., 3-2h)	V.Kudjak
Signals and Systems	(4th sem., 3-2h)	O.Ondracek
Analog Circuits	(5th, 6th sem., 3-2h)	I.Balaz
Microwave Techniques	(5th, 7th sem., 3-2h)	P.Hajach
Radio Communication Techniques	(5th sem., 2-2h)	P.Podhoransky
Bachelor Project I	(5th, 7th sem., 0-4h)	O.Ondracek
Digital Circuits	(6th sem., 3-2h)	P.Kulla
Term Project	(6th sem., 0-4h)	O.Ondracek
Applied Electroacoustics	(6th sem., 2-2h)	M.Pasko,A.Přibilova
Power Supply Sources for Electronic Devices	(6th sem., 2-2h)	M.Hruskovic
Electronic Measurements	(7th sem., 3-2h)	J.Hribik
Transducers of Biosignals	(7th sem., 2-2h)	M.Kukucka
Biophysics	(7th sem., 3-1h)	E.Cočerova
Final Project I	(8th sem., 0-8h)	O.Ondracek
Final Project II	(8th sem., 0-8h)	O.Ondracek
Studio Television Circuits and Equipment	(8th sem., 2-2h)	P.Kulla
Microcontrollers	(8th sem., 2-2h)	P.Fuchs
Electronic Instruments in Medicine	(8th sem., 2-2h)	B.Holly

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

Digital Signal Processing	(1st sem., 3-2h)	O.Ondracek
Sound Techniques	(1st sem., 3-2 h)	A.Přibilova
Medical Electronic Transducers, Circuits and Equipment	(1st sem., 3-2 h)	M.Kukucka
Electromagnetic Radiation Effects on Biological Objects	(1st sem., 3-2 h)	E.Cočerova

Diploma Project I	(1st sem., 0-6h)	V.Kudjak, O.Ondracek
Radio-communication Technologies and Networks	(2nd sem., 3-2h)	J.Petrek
Signal Recording	(2nd sem., 3-2h)	P.Podhoransky
Applied Electroacoustics	(2nd sem., 3-2h)	M.Pasko,A.Pribilova
Microcontrollers	(2nd sem., 3-2h)	P.Fuchs
Radionavigation Systems	(2nd sem., 3-2h)	M.Minarik
Digital Signal Processors	(2nd sem., 3-2h)	P.Fuchs
Analyses of Biosignals and Systems	(2nd sem., 3-2h)	J.Pucik
Diploma Project II	(2nd sem., 0-6h)	Kudjak,O.Ondracek
Digital Radio and Television Systems	(3rd sem., 3-2h)	P.Kulla
Team Project	(3rd sem., 0-8h)	I.Balaz,O.Ondracek
Diploma Project III	(2nd sem., 0-6h)	Kudjak,O.Ondracek

### III.3 Undergraduate and Graduate Study for Foreign Students (in English Language)

Electrical and Electronic Instruments in Medicine II	(4th sem.)	B.Holly
Digital Curcuits and Systems	(4th sem.)	M.Hagara
Microwave Techniques	(5th sem.)	J.Petrek
Radio Communication Techniques	(5th sem.)	P.Podhoransky
Influence of ERBO	(2nd sem.)	E.Cocherova
Digital Radio and Television Systems	(2nd sem.)	M.Hagara
Signal Recording	(2nd sem.)	P.Podhoransky
Diagnostic in Medicine	(2nd sem.)	M.Kukucka

### IV. RESEARCH PROJECTS

- Development of High-power six-port reflectometers (impedance analyzers) for different types of transmission media frequency rangers of 900 MHz and 2450 MHz. N/S – Mueg-Bez-EU9, J.Bezek
- Digital Processing New Methods of deterministic and non-deterministic Signals generated by Image Signals Sources and Biomedical Signals Sources with direct Application in modern Systems of Signals Digital Processing and Visualization. VG-1/0144/2003, P.Kulla
- EDUCTV – Requalification Program for Employees in Television Services and Information Technologies. 13120110064, P.Pis
- Improvement of Generation and Radiation Electromagnetic Waves in Mobile and Stationary Radiocommunications Systems; Technical and Environmental Approach. G 1/9045/02, I.Balaz
- Investigation of Methods of Increasing the Resolution of Scanning Capacitance Microscopes. G 2/2037/22, M.Hruskovic

- Design of progressive algorithms for the radio-communication network topology optimisation. 1/2047/05 VEGA, J.Petrek
- Digital Processing in Acoustic, Image and Biomedical Signals. 102/VTP/2000, P.Fuchs
  - Digital Processing in Acoustic Signals (A. Přibilová)
  - AMR and PLC Communication (P.Podhoranský)
  - Methods and System for Image Processing with Signal Processor TMS320C3x in Real Time (P.Kulla)
  - Power Amplifiers Analysis for Calibration Stations (J.Hribik)
  - Digital 3-phase Calibration Electricity Meter with DSP TMS320C6711 (P.Fuchs)
  - Single Phase Electricity Meter with Micro-controller MSP430FE427 (P.Fuchs)
  - Electronic Calibration Station EKS 05-3 (P.Fuchs)
  - Frequency Synthesis in the LERA Tranceiver by the DAFC (P.Fuchs)
  - Digital Frequency Locket Loop with High Spectral Purity (P.Fuchs, B.Lojko)
  - Control Application Based on GSM, GPS and USB Technology (P.Fuchs, B.Lojko)
  - Adaptive noise Canceling of the Acoustic Signal (P.Fuchs, L.Burián)

**Collaboration:**

- Aeronautical Station LERA TRX 1.5S (LOBB, Banská Bystrica)
- Digital Regulators of Operating Machine Action Elements (Vývoj Martin, a.s.)
- Digital Calibration/Registration Electricity Meter (Křížik GBI, a.s., Prešov)
- Electronic Calibration Station EKS-03 (Applied Meters, a.s., Prešov)
- Methods and System for Image Information Processing by Signal Processor TMS320C3x in Real Time (I.S.E.P. Paris)

**V. COOPERATION****V.1 Cooperation in Slovakia**

- Applied Meters, jsc.
- ANDIS plc. Bratislava
- AMSET plc., Bratislava
- ELSINCO, Bratislava
- HIS SENZOR plc. Prešov
- Institute of Encyclopedia, Slovak Academy of Sciences, Bratislava
- Institute of Physics, Slovak Academy of Sciences, Bratislava
- Institute of Measurement, Slovak Academy of Sciences, Bratislava
- Institute of Molecular Physiology and Genetics, Slovak Academy of Sciences, Bratislava
- Institute of Metrology Bratislava
- LOBB, Banská Bystrica
- Main Data, Bratislava
- Mediatech, Bratislava
- National Academy of Defence, Liptovský Mikuláš
- National Security Institute, Bratislava
- ORL Clinic, Faculty Hospital, Bratislava
- PHILIPS Slovakia, Bratislava
- PRIUS, Bratislava
- Prof. Déer Hospital, Bratislava
- RACOM, Slovakia
- SATRO, plc., Bratislava
- Slovak Broadcasting Corporation, Bratislava
- Slovak Institute of Technical Normalization, Bratislava
- Slovak Telecommunications / Radiocommunications, Bratislava
- Slovak Television, Bratislava
- MIRONIX Bratislava
- Special Software and Systems, Bratislava

- SWH, (Siemens), Slovakia, Bratislava
- Telecommunication Office SR, Bratislava
- T-Mobile
- University of Technology, Košice
- University of Technology, Žilina
- VUJE Trnava
- VÚS, Banská Bystrica
- Vývoj, Martin
- ZPA Krížik GBI, jsc.,Prešov

## V.2 International Cooperation

- AS Crystal, Hradec Králové, CzR
- Czech Technical University, Prague, CzR
- GAČR, Prague, CzR
- IBME Brno, CzR
- Institut für Allgemeine Physik, TU Vienna, Austria
- Institute of Technology, Tokyo, Japan
- I.S.E.P., Paris, France
- Muegge Electr., GmbH, Germany
- PHILIPS, Components Center Vienna, Austria
- Technical University Brno, CzR
- Technical University Ostrava, CzR
- Texas Instruments, Inc, USA
- University of Applied Sciences, Heilbronn, Germany
- Universite de Nantes, France
- URE AV CzR, CzR
- URSI Prague, CzR
- UTIA AV CzR, CzR
- TRICOM GmbH, Freising, Germany
- Centre of Biomedical Engineering and Physics, Medical University of Vienna, Austria

## V.3 Membership in International Organizations and Societies

- I.Baláž : URSI, Union Radio-Scientifique Internationale, Member of NC
- I.Baláž : IEEE, The Institute of Electrical and Electronics Engineers, Member
- Z.Krajčušková: URSI, Scientific Secretary
- P.Kulla : IEE, The Institution of Electrical Engineers, Fellow
- J.Hribik, I. Spudil, Z. Krajčušková : Radioengineering, Proc. of Czech and Slovak Technical Universities and URSI Committees, Members of Editorial Board, IEEE
- O.Ondráček: Acta Electrotechnica et Informatica, Proc. of TU Košice, Member of Editorial Board

## VI. THESES

### VI.1 Masters Theses

Masters theses supervised at the Department of Radio and Electronics. The names of supervisors are in brackets.

- [ 1 ] M.Belko: The Analog Audio Compressor, Expander and Limiter (P.Kubinec)
- [ 2 ] P.Bízik: Microphone Boom For Traverse Along Meridional Path (P.Kubinec)
- [ 3 ] V.Blažiček: Diagnostic Image Processing (F.Lehocki)

- [ 4] P.Ďalák: Sampling Oscilloscope with Two Channel A/D Converter AD9288 (Z.Brezovič)
- [ 5] P.Dinaj: Heart Rate Variability Analysis (J.Púčik)
- [ 6] T.Ihring: Methods for Decay Time Measurement in Closed Rooms (P.Kubinec)
- [ 7] P.Jaroš: Evaluation of Electrostatic and Temperature Fields Using FDTD Method (E.Cočerová)
- [ 8] P.Juhász: Video Sequences Encoding in Multimedia Systems (P.Kulla)
- [ 9] R.Karaffa: Application of Microcontroller ADuC 812 for Biosignal Processing (B.Hollý)
- [10] M.Krajmer: The Shape Modification of the Audio Signal (Distortion) – a Digital Sound Effect (P.Kubinec)
- [11] R.Lupták: Function Generator (M.Hruškovice)
- [12] R.Múdry: RF Resonators for Filters and VCXOs – Model Parameters Extracted from Measured Data (V.Kudják)
- [13] M.Rafaj: Burn-in of Electronic Devices (Z.Krajčušková)
- [14] M.Sádovský: Large Signal Effect on Varicap Controlled Oscillator Tune Characteristics (V.Kudják)
- [15] M.Soldán: Video Security System Based on PC (M.Hagara)
- [16] P.Svetlík: MIDI Interface Controlled Musical Synthesiser (P.Kubinec)
- [17] P.Šaštinský: Applications of Digital All-Pass Filters (O.Ondráček)
- [18] M.Širočka: Low Noise PLL Frequency Synthesizer (V.Kudják)
- [19] J.Šurda: Utilization of PhysioNet Resources for Spectral Analysis of ECG (J.Púčik)
- [20] M.Tihanyi: Software for Sensor (I.Spudil)
- [21] T.Tichý: Senzor Interface (I.Spudil)
- [22] P.Tréger: Data Connection Protocol Between PC and Interface for Sensor (L.Burián)
- [23] J.Vrabec: VOG – Videoculography (M.Kukučka)
- [24] M.Závodský: Time Variant Video Quality Evaluation for Mobil Networks (O.Nemethová)
- [25] J.Žakovič: Dual-Mode Piezoelectric Oscillator (M.Minárik)

### **VI.3 Doctoral Theses**

- [1] Grajciar, B.: Parallel Fourier Domain Optical Coherence Tomography (O.Ondráček)
- [2] Štofanič V.: Methods of Direct Reduction of Generated Signals Frequency versus Temperature Dependency in Digital Frequency Synthesis. (I.Baláž)

## **VII. OTHER ACTIVITIES**

none

## **VIII. PUBLICATIONS**

### **VIII.1 Journals**

### **VIII.3 Book**

### **VIII.4 Textbooks**