Topics for program Telecommunications (MPA-TEC)

Pulse and digital technology (pulse signal transmission, semiconductor elements in pulse technology, flip-flop and combination circuits, sequential synchronous circuits),

Microprocessor technology and embedded systems (microprocessor systems, instruction files, peripheral programming, serial communication),

Electromagnetic waves, antennas and lines (propagation of waves in free space, on conductors and waveguides, types of antennas and their parameters, impedance matching, antenna systems, basics of computational electromagnetism),

Microwave technology (dispersion parameters, waveguides and microwave integrated circuits, resonators and power dividers, directional couplers, Faraday's phenomenon and its use),

High-frequency technology (bound resonant circuits, power dividers and converters, narrowband and broadband amplifiers and mixers, their oscillators and stability, phase hinges),

Analog electronic circuits (basic function blocks, electronic element modelling, operational amplifiers and feedback, electrical filters, rectifiers and signal generators, oscillators),

Electrotechnical measurements (analogue and digital measuring devices, converting electric quantities, A/D and D/A converters, measuring DC and AC),

Digital processing and analysis of signals (linear digital systems, digital filters, complex signals, correlation and spectral analysis of signals, Fourier transform),

Communication systems (source and channel coding, encryption and cryptography, modulation and demodulation, synchronization of carrier and symbol timing, characteristics of computer networks),

Signals and systems (harmonic signals, periodic, non-periodic and aperiodic signals, correlation and convolution, linear and time-invariant systems, discrete time systems, random signals).

Evaluation of the entrance exam

The entrance examination consists of two parts which take place in one day. The first part is a written exam, which takes place in the morning. The second part is an oral exam, which takes place in the afternoon. The second part of the entrance examination can only be submitted by candidates who successfully complete the first part of the test, i.e. they will receive a higher number of points than the set minimum score.

The first part of the entrance examination – the written exam, lasts 75 minutes. The maximum number of points that can be obtained is 100. The exam consists of 10 questions selected from two thematic areas which are listed above. The subject areas and their content are determined by the Board of Study Programs. The assignment of questions will be made by the academic staff so that the difficulty of each question is equivalent. These assignments are kept strictly secret until they are unsealed. The assignment and writing of the written exam is in English.

The written work of the first part of the entrance examination is evaluated immediately after its completion. The authorized employee guarantees the correctness of the evaluation. The results of the first round are available to the applicants on the BUT website at (https://www.vutbr.cz/eprihlaska/en/ after entering the application password.

The second part of the entrance examination - the oral exam, takes approximately 30 minutes. Taking part is conditional upon successfully completing the first part of the examination. A commission consisting of internal members (academic staff of FEEC BUT) and external members (external academic staff even from abroad and specialists from the industry) is appointed for the oral part of the examination. The maximum number of points that can be obtained is 30. The exam consists of three theoretical questions and takes the form of a professional discussion with the candidate. It focuses on the topics specified in par. 3. The oral exam is in English. Candidates are expected to have a good command of English when communicating with members of the Commission.

The result of the oral test is evaluated immediately after its termination. The authorized employee guarantees the correctness of the evaluation. The results of the second round are again available to applicants on the BUT website at (https://www.vutbr.cz/eprihlaska/en/ after entering the application password.