Communication and Information Technology

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Faculty	Faculty of Electrical Engineering and Computer Science
Type of study	Follow-up Master
Language of instruction	English
Code of the programme	N0714A060021
Title of the programme	Communication and Information Technology
Regular period of the study	2 years
Coordinating department	Department of Telecommunications
Coordinator	prof. Ing. Miroslav Vozňák, Ph.D.
Key words	Security in Communications, Communications Network, Mobile and Radio Communications (5G), Internet of Things, Optical Communications and Sensors

About study programme

A graduate of the two-year study programme “Communications and Information Technology” (CIT), gets skills and knowledge in the fields of Communications Network (CN), Mobile and Radio Communications (MaRK) and Optical Communications and Sensors (OCaS). It excels in broad and deep theoretical and practical knowledge in the areas of the above-mentioned fields, which it can apply to both technical and management positions

Professions

- Communication network specialist
- Communications network designer
- Mobile network designer
- Radio network consultant
- Communications network designer
- Communication networks administrator
- Mobile applications developer
- Mobile technologies expert
- Mobile technologies expert
- Communication network specialist
- Radio network administrator
- Expert in ICT security
- Communication networks service engineer
- Mobile applications developer
- Radio networks service technician
- Radio networks administrator

Hard skills

- Transmission networks
- Programming techniques (C, Java...)
- Knowledge of computer HW components
- Optical sensors and networks
- Creation of technical reports in the field of electrical engineering
- Algorithms and data structures
- ICT security

- Application programming
- Computer network administration
- Physicak design of the database
- CISCO certification
- Knowledge of technical English
- IP communication protocols
- Firewalls
- Work in MATLAB and Simulink
- Knowledge of networks
- Cyber security
- Knowledge of network infrastructure
- Network infrastructure
- Telecommunication SW
- OS Linux
- Work in Octave
- SW - MATLAB/Simulink (creation of simulation models and system simulation)

Graduate's employment

The graduates of this degree program meet the current business requirements. They have added value in the labor market thanks to their ability to solve practical tasks in the field of terminal equipment, network technologies. They also handle practical issues of solving mobile and optical communication networks. The graduate employment is wherever there is a need to solve data transmission and processing and other demanding tasks in the ICT field. The graduate will find employment in the labor market, for example, as a specialist, designer, administrator, ICT administrator and service technician of optical and mobile networks; ICT security expert, mobile application programmer, specialist in science, research and development, university pedagogue and the like.

Study aims

The two years program follows the bachelor's study programme Communications and Information Technology (CIT) . The master's study programme CIT develops and supplements students' skills and knowledge in the fields of Communications Network (CN), Mobile and Radio Communications (MaRK) and Optical Communications and Sensors (OCaS). The graduate excels in theoretical and practical knowledge in the areas of the above-mentioned fields, which it can apply to both technical and management job positions.

Graduate's knowledge

The graduates can apply knowledge in practice and perform analysis in various areas of communication and information technologies and the field of soft skills. All three specializations aim to provide an engineer education with a deeper theoretical foundation as well as practical knowledge of modern communication and information technology.

The Communication Networks specialization focuses on the subjects of optoelectronics, electronics, and the technologies of communication through metallic, optical, and wireless media. The graduates will gain knowledge especially in the field of fixed communications, means of modern network technologies, a wide range of communication services (including Internet technologies), sensory low-energy networks, security methods, or high-speed multimedia transmissions. The course will also focus on the design and implementation of computer networks as well as various information techniques with the possibility of specializing in the digital processing of speech, music, and video signals.

The graduates of the Mobile and Radio Communications specialization will gain in-depth knowledge and practical skills in the field of mobile radio-communication systems. They will also understand in more detail the problematics of end devices both in terms of hardware and software, including the design of applications for these devices.

The graduates of the Optical Communications and Sensors specialization will gain in-depth theoretical knowledge and practical skills

in both optical communications and applications of the new technological direction, which are fiber-optic sensors. The graduates will learn the design of fiber communication systems and can solve problems related to the physical layer of fiber-optic networks. They will comprehend data processing methods, transmission security, and skills related to fiberless communications in urban and rural areas along with communications in white light. The graduates will know the design and construction of fiber-optic sensors, especially based on Bragg gratings, interferometers, intensity, and polarimetric sensors. They will understand fiber-optic and optical solutions for measuring and monitoring quantities significant in industrial and human applications such as temperatures, pressures, forces, electrical and magnetic quantities, speeds, vibrations, etc.

Graduate's skills

The graduates with the engineer degree have the ability to specialize and adapt to the needs of practice and research, has the ability to continuously amplify knowledge in the field. The graduate finds his job as a creative worker in a research field, technical development area and design. He is also able to design theoretically demanding works and he can implement them as an individual, member or leader of the research team. He can choose a suitable procedure and suitable technologies for the demanding solution. In non-standard situations, he can modify appropriately commonly used procedures. He is able to compare and evaluate different procedures. He is able to defend the proposed solution in a professional discussion with academic staff and workers from industrial practice. Thanks to the student’s involvement in the projects and grants coming out from industrial practice, the graduate will be able to find both practical solutions applicable in practice and theoretical background related to work in the laboratory with simulation tools.

Graduates of the Communication Networks can apply their skills in the design, implementation and operation of communication networks and services as well as in all areas of data, telecommunications, radio and information technology applications. He will acquire knowledge and skills that will allow him to work independently in teams in solving projects in various fields of electronic communications.

Graduates of the Mobile and Radio Communications specialization are able to apply their skills in the field of design, implementation and radio networks and services operation. He can design large scale works (e.g. software products in the mobile networks environment) and implement them as a member or as a leader of the research team.

Graduates Optical Communications and Sensors can apply their skills in the design, implementation and operation of optical networks and services. He can design large networks, solve problems and disruptions caused by the operation of fibre networks and systems. Deep theoretical knowledge will enable him to work in the research and development of new measurement and monitoring fibre-optic and optical sensor systems.

Graduate's general competence

The graduate is able to communicate with other team members or with customers when specifying the task, problem solving and product transfer. Furthermore, he is able to manage the teamwork of solvers, set objectives, identify strategies, choose alternatives to solutions, present and defend its views and chosen solution practices, communicate with experts in the field in English, take responsibility for its decisions and the work of the team, study specialist literature and further expand its knowledge and skills in fields of particular fields and close fields. This includes the ability to decide technical and economic issues of the field and technical solution. He can do independent and creative work in finding information resources from the fields of communication technology, mobile communications, optoelectronics and optical communications, multimedia technology and their critical assessment. He is able to manage the independent management of specialist teams, their coordination and control of the results of work. In the course of his studies, the graduate is encouraged to actively use the English language, encounters preparation and formulation of project and grant objectives, larger or smaller technical tasks, learns active conversation with various staff in the search and achievement of solution results, gets a basic overview of the financial implications of technical solutions, manages the different roles in the collective of solvers and collaborators from small group management to ancillary technical work and activities, will be able to further educate himself.

Study curriculum

- form Full-time (en)