

Electrical Engineering Science

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Faculty	Faculty of Electrical Engineering and Computer Science
Type of study	Doctoral
Language of instruction	English
Code of the programme	P0713D060001
Title of the programme	Electrical Engineering Science
Regular period of the study	4 years
Coordinating department	Department of Applied Electronics
Coordinator	prof. Ing. Petr Palacký, Ph.D.
Key words	Automotive Electronics, Electrical Machines and Apparatus, Industrial Electronics, Power Electronics, Electrical Drives

About study programme

The doctoral study program of Electrical Engineering Science is focused on the scientific research and independent creative activity in various sub-areas of the electrical engineering, including industrial electronics, automotive electronics, power electronics, electrical machines and apparatus, electric drives. Therefore, the study is focused on the deepening of the theoretical basis of electrotechnical branches and on the detailed introduction to modern knowledge in a narrower focus, on which the topic of the doctoral dissertation is followed. The doctoral study enables PhD students to build on the master's degree programmes offered at the Faculty of Electrical Engineering and Computer Science at VŠB-TUO.

Professions

- R&D engineer in automotive
- HW/SW developer
- Programmer of automotive applications
- Power electronics design engineer
- Electric drive design engineer
- Academic staff member
- Research and development
- R&D engineer for commercial electronics
- University teacher

Hard skills

- HW of automotive electronic systems (design of electronic part, determination of systém concept)
- SW - MATLAB/Simulink (creation of simulation models and system simulation)
- Design of uncontrolled and controlled electric drives (AC, DC)
- Control electronics (control systems with microprocessors)
- Electrical machines and appliances
- Computer HW components - knowledge at the advanced user level
- Power electronics (design, knowledge and use of semiconductor converters)
- Electronic systems testing (HIL platform Vector VTSystem)

Graduate's employment

The graduates in the Doctoral study programme of Electrical Engineering are highly qualified experts, who are able to apply in their

work modern findings of the individual branches of electrical engineering, especially in the field of industrial electronics, automotive electronics, power semiconductor systems, electrical machines, electrical apparatus and electrical drives. The graduates can find employment as scientific workers in research and development. They are able to work in research independently or in a scientific team. The graduates are also prepared for pedagogical and scientific activities at universities. The graduates can find employment as scientific workers at research institutes and in development departments of industrial companies, as research professors at technical universities, or as managers in the spheres of research, development, or corporate management.

Study aims

The aim of the doctoral study program is the education of specialized experts, which develops abilities of the excellent graduates of the master's degree programmes for independent creative work in the area of research, development and improvement of technologies. The PhD student will demonstrate the ability to extend the knowledge of the studied part of the study programme in a creative way by further study of theoretical and applied subjects according to the individual study plan and by the elaboration of the doctoral dissertation from any field of electrical engineering. The quality of teaching in the doctoral study programme of Electrical Engineering Science will be evaluated by the number of successfully defended doctoral dissertations and by the number of PhD students' scientific and research results during doctoral study according to the current methodology of evaluation of science and research of the Ministry of Education, Youth and Sports.

Graduate's knowledge

Graduates of the doctoral study programme Electrical Engineering Science have a deep and systematic knowledge that corresponds to the current state of knowledge in the field of industrial electronics, automotive electronics, power semiconductor systems, electrical machines, electric devices and electric drives. They understand the theories, concepts and methods that are at the forefront of knowledge of the branch at national and international level. They understand the system of sciences and research problems at the boundary of the branches.

Graduate's skills

The graduates of the doctoral programme Electrical Engineering Science are able to design and use advanced research methods in the fields of industrial electronics, automotive electronics, power semiconductor systems, electrical machines, electric devices and electric drives that allow knowledge expanding in these areas by original research. The graduates are able to develop new theories and methods including the definition of fields or their inclusion in a wider area.

Graduate's general competence

Graduates of the doctoral study programme of Electrical Engineering Science are able to evaluate new knowledge and ideas, taking into account the long-term social consequences of their use, to plan extensive activities of a creative nature and to obtain and plan resources for their realization. They are able to find a separate solution of complex ethical problems at the creative activity or the use of its results. The graduate can comprehensibly and convincingly communicate his own knowledge in the field to other members of the scientific community at international level and to the general public. They are able to use their expertise, professional skills and general competence in at least one foreign language. The graduate is able to acquire new expertise, skills and competences by its own creative activities and to influence the conditions and context of the education of others.

Study curriculum

- form Full-time (en)
- form Part-time (en)