

Electrical Power Engineering

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Faculty	Faculty of Electrical Engineering and Computer Science
Type of study	Doctoral
Language of instruction	English
Code of the programme	P0713D060004
Title of the programme	Electrical Power Engineering
Regular period of the study	4 years
Coordinating department	Department of Electrical Power Engineering
Coordinator	prof. Ing. Stanislav Rusek, CSc.
Key words	Use of Electrical Energy, Electrical Power Engineering, Energy Systems, Production of Electrical Energy, Transmission and Distribution of Electrical Energy

About study programme

The aim of the Doctoral course of study is to prepare highly qualified experts who are able to develop their branch of study by searching for new, original solutions, methods, and procedures, as well as to apply the most demanding generally known methods. The typical employment of the graduates is in the area of research and development, and at universities. Also, the graduates often operate on the international level, e.g. membership in international teams and defending results in front of the international community.

Professions

- Power engineering design engineer
- Power engineering researcher
- Power engineering project manager
- Power engineering investment specialist
- Power engineering auditor

Hard skills

- Asynchronous generators (design, control, diagnostics)
- Applications of the basics of thermodynamics in power engineering and thermal engineering
- Design of electrical devices
- Application of mathematical methods in energy and thermal engineering
- Electricity safety
- Design of non-rotating electrical machines
- Orientation in technical drawings
- Calculation of heat losses of facilities, energy distribution, and buildings
- Synchronous generators (design, control, diagnostics)
- Reading technical documentation
- Electricity networks
- Heat transfer calculations in buildings and facilities
- Application of natural sciences in energy and thermal engineering
- Orientation in the field of thermal energy equipment
- Lighting systems
- Energy balances
- Knowledge of creating energy balances and standardization of energy consumption

- Design of lighting
- Renewable energy sources
- Design of rotating electrical machines
- Distribution networks

Graduate's employment

The graduates in Doctoral studies can find employment mainly as scientific workers or as managers in research, development or marketing. They are able to conduct scientific work both individually and within a scientific team. Also, the graduates are prepared for educational and scientific activity at universities. The graduates are also able to deal with operational and technical problems in the spheres of generation, transmission, distribution and use of electric energy. The graduate can find employment at leading and managerial positions at the stages of assembly, implementation, maintenance and operation of electrical equipment, in technical, design, investment, and operational departments of power plants and distribution companies, in power control rooms, departments of preparation and operation of electrification systems, in technical, design, investment, assembly, and operational departments of industrial companies, in the area of the use of electrical energy in industry, when dealing with the issues of electrical drives, electric heating equipment, electric lighting of indoor and outdoor areas, at testing laboratories, and in technical testing.

Study aims

The Doctoral study program Electrical Power Engineering takes four years, graduates receive the academic degree of Doctor (Ph.D. following their name). This program builds on the completed Master's degree, and the student demonstrates his/her ability to perform independent scientific work. The aim of the Doctoral study program is to further develop the capacity of the excellent Master's degree graduates for independent creative work in research, development and technological improvement. Through further study of theoretical and application subjects according to an individual study plan and by creating a Doctoral thesis on one of the Electrical Engineering subjects, the student demonstrates his/her ability to creatively expand the existing knowledge of the researched field of study. With his/her dissertation, the student proves his/her ability to creatively solve and present a given problem both orally and in writing, and to defend his/her own approaches to solutions.

Graduate's knowledge

Graduates of the Doctoral study program demonstrate:

- a deep and systematic knowledge and understanding of the subject and scope of the discipline corresponding to its contemporary state of knowledge.
- a deep and systematic knowledge and understanding of theories, concepts and methods appropriate to the contemporary state of knowledge of the discipline at the international level.
- an understanding of the system of sciences and research problems on the discipline's boundaries.

Graduate's skills

Graduates of the Doctoral study program are able to:

- design and use advanced research techniques in the discipline in a manner allowing the expansion of knowledge of the discipline through original research.
- develop and evaluate theories, concepts and methods of the discipline, including the definition of fields or their inclusion in wider areas.

Graduate's general competence

Students of the Doctoral study program are able to:

- assess new knowledge and ideas with regard to the long-term social consequences of their use.
- plan extensive activities of a creative nature and gather and schedule resources for their implementation.
- independently solve complex ethical issues during creative activity or whilst using its results.
- clearly and persuasively communicate their own knowledge in the discipline to other members of the scientific community at an international level, and also to the general public.

- use their expertise, skills and general competence in at least one foreign language.
- acquire new expertise, skills and competences through their own creative work, and influence the conditions and context of education of others.

Study curriculum

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