VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF MECHANICAL ENGINEERING

Study programme Energy Processes

Generated: 26. 4. 2024

Faculty	Faculty of Mechanical Engineering
Type of study	Doctoral
Language of instruction	English
Code of the programme	P0713D070004
Title of the programme	Energy Processes
Regular period of the study	4 years
Cost	500 CZK per semester
Coordinating department	Department of Power Engineering
Coordinator	prof. Ing. Stanislav Honus, Ph.D.
Key words	Energy Sources, Science and Research in Energy Engineering, Energy Systems and Technology, Environmental Engineering

About study programme

Power engineering forms a part of almost all human activities.
The objective of the "Energy processes" postgraduate study program is to train students in creative research work in the field of power engineering. The graduates obtain the “PhD” title, the highest possible academic degree.
The studies are conducted in the form of day or combined studies.
The studies takes place based on individual study plans, which specify the study time schedule, professional and research activities, focused on preparing doctoral thesis, exchange scholarships at other workplaces, including international, or certain minimal pedagogical work (such as leading seminars).
As a part of the study, the student must participate in at least six subjects out of the subjects offered in the given Study Plan. Five of these subjects must be from the “Technical subjects” part and one subject from the “Foreign languages” part. Selection of the technical subjects is based on the topic of the given doctoral thesis.
A state doctoral exam is organized at the end of the study part. It includes a scientific discussion in three subjects specified in advance and a discussion about the theses of the dissertation.
As a part of the next study stage, the student conducts activities (such as experimental work) that are needed for preparing the given dissertation and activities that are necessary for fulfilling the study qualification conditions (for example, publication activities). The studies are completed by the corresponding dissertation defense.
All other information is included in the Study and Examination Regulation for doctoral studies programs at VŠB-TU Ostrava.

Professions

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

Hard skills

- Application of mathematical methods in energy and thermal engineering
- Knowledge of creating energy balances and standardization of energy consumption
- Energy calculations
- Heat sharing and mass transfer
- Renewable energy sources

- Energy machinery and equipment
- Knowledge of the use of alternative energy sources
- Knowledge of the effects of thermal processes on the environment
- Ability to determine energy and exergetic balances of equipment
- Application of natural sciences in energy and thermal engineering
- Determination of efficiency of thermal and energy equipment
- Knowledge of methods and instruments for measuring thermal technical quantities
- Modelling of thermal processes and its use
- Knowledge of methods for reducing the effects of thermal processes on environmental components

Graduate's employment

Employees in the scientific, research and education spheres, as well as the industrial sphere, in the research, development, construction, production and management levels are sought after all over the world. Finding a corresponding job cannot thus be considered critical. Some of the typical job positions of our graduates include:
- employees in the field of mechanical power engineering, development, project engineering, construction, calculations, production, assemblies and testing,
- operation, project engineering and managerial employees at power stations and heating plants, and at power engineering units in all types of industrial business as well as nonproduction sphere,
- project engineers in investment construction in the field of power engineering,
- managerial employees in institutes, institutions and units of various state authorities that are engaged in the field of power engineering, safety and protection of the environment,
- technicians, calculation operators or construction technicians at power engineering companies, including the possibility of a self-employment (power engineering audits, consultation and advisory services),
- creative employees at project engineering studios that focus on power engineering,
- revision and test technicians of power engineering facilities,
- independent power engineering auditors,
- managerial employees in power engineering companies.

Our graduates can find jobs at power stations and heating plants, power engineering units of all types of industrial companies, transport companies and even non-production spheres and state administration bodies. Moreover, they can seek jobs in project engineering offices of power engineering entities, heat supply systems and wastewater treatment plants.
Upon completing their studies, our graduates can also continue in their professional scientific development as:
- scientific and research employees at research institutions and, when applicable, universities,
- post-doctoral researchers at technical universities and the Academy of Sciences,
- academic employees at universities with habilitation perspectives.

Study aims

The objective of the “Energy processes” postgraduate study program is to train students – specialized experts, able of an independent creative work in the area of research of power engineering transformations, development and improvements of power engineering technologies. The objective is achieved by studying selected technical subjects pursuant to the given individual study plan, by employing creative scientific and research work and by preparing doctoral dissertations of an international standard.

Graduate's knowledge

Students of the “Energy processes” postgraduate study program are obliged to study technical subjects, offer of which covers the dominant area of power engineering, including a possibility to study theoretical subjects from the area of mathematics and physics. A part of the study program is formed by a mandatory study of a foreign language. The doctorands enhance their special technical knowledge, related to the topic of their respective dissertations, by individual studies of the corresponding literature and consultations with experts, making sure their knowledge corresponds to the current degree of knowledge in the studied field in Europe and around the world.

Graduate's skills

Graduates of the “Energy processes” doctoral study program, as power engineering experts, are able to independently engage in research with the objective to enhance the knowledge in the studied field on an international level and to improve the energy and economical level of power engineering devices. They should be able to commence the research process by a theoretical analysis, to continue with an analysis of energy transformations, and to complete it by a corresponding optimal technology proposal that corresponds to the given issue. It goes without saying that they should be able to master pilot and operation experiments with subsequent data assessments and, if applicable, added numerical simulations.

Graduate's general competence

Graduates of the “Energy processes” doctoral study program can:
- independently formulate scientific problems,
- propose solution methods and experimental activities that lead to the given problem solution,
- communicate and present the results of their work in writing and verbally at an international level in a world language,
- assess new knowledge and ideas, considering long-term social consequences of their application,
- learn new technical knowledge and, subsequently, educate other students and coworkers.

Study curriculum

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