VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF MECHANICAL ENGINEERING

Construction of Production Machines and Equipment

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Faculty	Faculty of Mechanical Engineering
Type of study	Doctoral
Language of instruction	English
Code of the programme	P0715D270012
Regular period of the study	4 years
Coordinating department	Department of Machine and Industrial Design
Coordinator	doc. Ing. Jiří Fries, Ph.D.
Keywords	Engineering, Machine design, Construction and calculations, Designing, Constructing

About study programme

This study program offers studies in one of several areas of industrial practice in the field of design and calculation of machines, their structural nodes, and components. These mainly include production machines; earthmoving, mining, and construction machines; transport and material handling, etc. An integral part of the program is also machine drives, from mechanical and electrical to hydraulic and pneumatic drive units.

The entire study program is highly specialized and applies the latest knowledge in the field of mechanical engineering in line with the needs of industry. State-of-the-art procedures and optimization methods are used in designs and calculations. Working with modern 3D CAD applications and FEM systems is a matter of course. Students will design machines and machine parts with regard to load-bearing capacity and required service life. Graduates will learn to master these tools at a professional level as designers or calculators in all fields of mechanical engineering.

Graduate's employment

Graduates will find employment as calculators, designers, and developers in the design departments of renowned companies, as well as designers and managers in senior positions, often in multinational companies. Some graduates also find employment in science and research, both at universities and in the R&D departments of industrial companies.

Study aims

The Construction of Production Machines and Equipment program aims to educate highly qualified experts and researchers in the field of machine design and sophisticated production technologies, whether it be basic design elements and assemblies or complex projects involving large machine units.

As mentioned above, the program consists of several fields covering a relatively large area of mechanical engineering and are covered by individual departments of the Faculty of Mechanical Engineering participating in this study program.

Graduate's knowledge

Graduates of the program will gain information and knowledge in the field of design, construction, operation, maintenance, and diagnostics of production machines and equipment in various fields of human activity. They will learn the principles and skills of methodical design and design theory using computer support. They will gain a deeper understanding of the core disciplines of mechanical engineering as a broad foundation for creative application in mechanical engineering and for further professional growth through various forms of lifelong learning.

Basic professional knowledge of program graduates:
• they have theoretical and practical knowledge in the field of technical processes, engineering technology, and related disciplines.
• they understand the principles of design, production technologies, and the operation of machines and equipment.
• they have knowledge in the field of materials engineering, mechanics, thermodynamics, and technological process control.
• are familiar with modern software tools for modeling, simulation, and technical calculations,
• are prepared to solve practical and research tasks related to the development, optimization, and efficient operation of machines and equipment.

Graduate's skills

Graduates of the doctoral program in Construction of Production Machines and Equipment will acquire the theoretical knowledge, practical skills, and experience necessary for independent scientific work in individual areas of the field, reflecting the design directions of the Faculty of Mechanical Engineering and the needs of industrial practice.

Basic skills of program graduates:
• management of design work and projects for a comprehensive product type from design to implementation in production,
• design, operation, maintenance, and diagnostics of technical equipment,
• processing of procedures, instructions, and other documentation for testing, use, and technical conditions of the product, etc.
• use of modern software tools (CAD, CAE) for modeling and analysis,
• independence in solving technical problems, including economic and environmental assessment,
• readiness to work in design offices, manufacturing companies, and industrial practice operations.

Graduate's general competence

Graduates will develop their knowledge and skills in the design of machine parts, assemblies, and machinery, learn the principles and knowledge of a methodical approach to design, design theory, and thoroughly learn how to use computer technology and computer graphics in the design and engineering of machines and equipment. They will gain information and knowledge based on practical experience in the field of machine and equipment design and construction. Through their studies, graduates will deepen their ability to pursue further education. They will be guided to communicate both within and outside the team, including industrial practice. An integral part of the study program is the development of one's own personality and judgment.

Professions

- Project manager
- Researcher
- Teacher and lecturer
- Production manager
- Production system engineer
- Sales and technical manager
- Business and marketing manager
- Industrial engineer

Hard skills

- Knowledge of construction of earthmoving machines
- Knowledge of construction of mining machines
- Knowledge of construction of production machines
- Calculations of machine parts
- Creation of technical reports

- Knowledge of construction of drilling machines
- Creation of 3D computer models
- Knowledge of construction of forming machines
- Design of production machines
- Knowledge of construction of loading machines
- 2D design programmes
- Analyzing a design problem
- Knowledge of construction of driving machines
- Component design
- Reading technical documentation
- Knowledge of construction machines
- Knowledge of machine tool construction

Study curriculum

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