VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF MINING AND GEOLOGY

Petroleum Engineering

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Faculty	Faculty of Mining and Geology
Type of study	Bachelor
Language of instruction	English
Code of the programme	B0724A290005
Title of the programme	Petroleum Engineering
Regular period of the study	3 years
Coordinating department	Department of Geological Engineering
Coordinator	doc. Ing. Martin Klempa, Ph.D.
Key words	Underground Gas Storage, Oil and Gas Exploitation, Drilling Engineering, Geology Exploration, Reservoir Engineering

About study programme

The "Petroleum Engineering" study program is a complex study program that includes a number of disciplines such as geology, chemistry, physics, mechanics, mechanical engineering, material engineering, IT technology, also including good language skills (primary English).
The aim of the study is to educate a qualified expert in the field of reservoir and exploitation engineering, respectively an expert for working on a drilling rig (for drilling of deep wells with heavy drilling rigs or workover drilling rigs, eventually for rigs for liquidation or re-liquidation wells). Thanks to complex knowledge of geology, technics and technology exploitation and storage of hydrocarbons, students will be able to solve operational problems of oil engineering.
In the area of hydrocarbon exploitation and underground gas storage, these include the issues of daily production of wells, the intensification of exploitation and the planning and execution of workover jobs, as well as the liquidation of wells. In the field of deep drilling, it is mainly about practical knowledge of operating individual drilling rig technologies (mud engineering, drilling rig machinery, drilling and casing strings, etc.).

Hard skills

- Orientation in schemes
- Knowledge of industrial technologies and their impact on the environment
- Orientation in technical drawings
- Project management
- Reading technical documentation
- Designing
- Knowledge of materials
- Expert knowledge in the field of power engineering
- Knowledge of health and safety requirements, knowledge of working with ISO standards

Graduate's employment

The level of knowledge after the completion of this bachelor's study program represents sufficient and high-quality professional equipment for intermediate technicians in the position of reservoir operator / operational technician, or technology in the middle positions of all types of drilling operations.
After completing this bachelor's degree program, graduates will have mainly the practical knowledge necessary to manage daily (normal operational) problems. In the field of hydrocarbon exploitation, it is mainly the knowledge of daily wells, normal dispatching

operations or planning workover operations. In the field of drilling, it is the knowledge of intermediate drilling technicians in the field of mud engineering, pressure manifestations or standard daily drilling activities.

Study aims

The aim of the study of the bachelor's study program is the education of a qualified expert at the level of intermediate technician for day / shift operation in the field of reservoir and exploitation of engineering, respectively shift operation on a drilling rig.
Another goal is to train specialists for drilling complex wells with heavy drilling rigs, for working with lighter rigs, intended for workover and liquidation of old wells and in general for controlling the drilling process on drilling rigs of all types, including those used for hydrogeological, engineering geological drilling and geothermal wells.
Thanks to comprehensive knowledge of geology, techniques and technologies of exploitation and storage of hydrocarbons, respectively techniques and technologies of well drilling, graduates (after getting acquainted with the specific workplace) will be theoretically and practically able to solve daily operational problems of exploration and exploitation of oil and gas, as well as daily UGS operations.
In the area of hydrocarbon exploitation and underground gas storage, it is mainly a question of daily probe performance, intensification of exploitation and planning and implementation of workover, including their liquidation.
In the field of oil and gas drilling, as well as in the category of hydrogeological, engineering geological and geothermal wells, it is mainly practical knowledge of operating individual drilling rig technologies (mud engineering, drilling rig machinery, drilling and casing column assemblies, etc.) and direct control of the drilling process with an emphasis on the economics of operation, compliance with the rules of occupational safety and health and the principles of environmental protection.

Graduate's knowledge

Oil and natural gas are one of the world's key energy sources. Worldwide, there is a high demand for these minerals, and thus logically increases the complexity of geological exploration and especially the pressure to optimize the method of mining and efficient opening of these deposits. At present, hydrocarbon deposits are exploited at great depths and under more difficult geological and climatic conditions. Exploration and drilling is then one of the key disciplines of this industry. Hand in hand with this is the complexity of exploration and exploitation work itself.
Obtaining energy from renewable geothermal sources is a developing field. The activities of research, exploration, construction and use of high - potential and low - potential geothermal resources require a wide range of expertise from geological, drilling - technical, technological and engineering fields.
The "Petroleum Engineering" study program is a comprehensive study program that includes a number of scientific disciplines such as geology, chemistry, physics, mechanics, mechanical engineering, materials engineering, IT technology and more, including good language skills. Graduates of this study program are in great demand worldwide and quality education in these disciplines plays a key role.
The bachelor's study program is based on a strong geological background with an overlap into the technique and technology of hydrocarbon exploitation and drilling. The level of knowledge after the completion of this bachelor's study program represents sufficient and high-quality professional equipment for intermediate technicians in the position of reservoir operator / operational technician, or technology in the middle positions of all types of drilling operations. After completing this bachelor's degree program, graduates will have mainly the practical knowledge necessary to manage daily (normal operational) problems. In the field of hydrocarbon exploitation, it is mainly a matter of knowledge of daily wells, normal dispatching operations or planning workover operations. In the field of drilling, it is the knowledge of intermediate drilling technicians in the field of mud engineering, pressure manifestations or standard daily drilling activities.

Graduate's skills

Graduates of the bachelor study program "Petroleum Engineering" will be able to:
- solve practical operational problems of reservoir engineering at the level of middle technician (necessary wide geological basis of study);
- operate exploitation wells and plan their exploitation regime;
- operate wells in UGS, including supervision of planned workover jobs and their liquidation;

- ensure the dispatching operation of hydrocarbon exploitation, respectively ensure shift control operation of UGS;
- interpret various types of static and dynamic models of hydrocarbons deposits based on theoretical knowledge of oil deposits modeling;
- master shift operations on drilling rigs (heavy drilling rigs, workover drilling rigs);
- master the basic level of the Well Control test (organized by the International Well Control Forum) required for daily practice in the oil industry.

Graduate's general competence

Thanks to his knowledge of geology, techniques and technology of exploitation and drilling, the graduate will be a qualified expert in the field of exploration and exploitation of hydrocarbons, underground storage of natural gas, use of geothermal energy and also in the implementation of a wide range of well types with various technologies and drilling rigs.
Thanks to his knowledge of a wide portfolio of general, geological, engineering and drilling disciplines, he will be able to analyze the operational problems of exploration, exploitation and drilling operations and find an adequate solution by synthesis. In the complex processes of exploration, extraction and drilling of various types of wells, it will communicate with all stakeholders in a qualified manner, not only in professional issues, but also in the field of organization and administration.
Thanks to their knowledge and skills, the graduate will be prepared for further professional growth in the field, as an alternative to continuing to study the Petroleum Engineering program at the master's level. High-quality language equipment will provide graduates with the opportunity to work in appropriate positions, or for follow-up studies, abroad.