

EXPERT OPINION

on the developed modular education programs of Vocational Master's program
on specialty 6M072100 "Chemical Technology of Organic Substances"
of S. Toraihyrov Pavlodar State University

Modular educational programs of vocational master's program on specialty "Chemical Technology of Organic Substances" has two educational programs:

- Oil and gas processing;
- Safety of life and protection of the environment in oil chemistry.

The goal of the educational program is targeted training of highly qualified specialists for oil refining industry.

The term of study at an educational program of Vocational Master's program "Oil and gas processing" is 1.5 years with 90 ECTS.

The purpose of the educational program is achieved by formation of competencies, skills and knowledge through study of specialized courses combined with practical training, experimental work and internship.

The structure of the educational program consists of obligatory (30%) and elective courses (70%). Obligatory part of the professional educational program is aimed at creating management, communicative skills, consisting of the ability to plan and organize the work of the team, using modern management principles and business communication; analysis and control of industrial activity units; ensure compliance with the requirements of industrial safety and labor protection in the petrochemical industry. In addition, the program provides increase of the foreign languages competence.

Elective part of the educational program enables the expansion and deepening of training and additional competencies, skills and knowledge needed to ensure the competitiveness of graduates in accordance with the requirements of the labor market.

Specialty modules provide theoretical and practical training in the field of technology for the processing of oil, gas, oil residues, polymers, environmental safety; development of modern methods of materials research.

The module "Technological processes and innovation" is aimed at studying the specifics of regional technology companies in refining industry.

The module "Processes and industrial ventilation" is focused on the study of the specifics of regional technology companies in refining industry and the development of measures for industrial ventilation in the workplace.

Practical skills for calculations and modeling using computer applications, required for engineering staff, are provided by the module disciplines "Computer modeling of technological processes" – "Industrial Informatics" and "Computer modeling of oil refining processes".

Module "Equipment, processes and methods in oil industry" provides knowledge of the basic processes and apparatus of oil and gas refinery; principles of selection and operation of devices with different design features; specificity of polymers and plastics technology. The module provides the



development of chromatographic methods for analysis of gases and gas condensates.

Module “Equipment, processes, and environmental security” provides knowledge of the basic processes and apparatus of oil and gas refinery and the development of measures to ensure chemical and biological safety.

Module “Professional training” exposes graduate students to the experience in the manufacturing plant and laboratories of the University. Development of various techniques for analyzing chemical modern instrumental methods allow to increase the attractiveness of graduates to employers.

The distribution of disciplines and practices by semester corresponds to the logical sequence and allows balancing the workload of students.

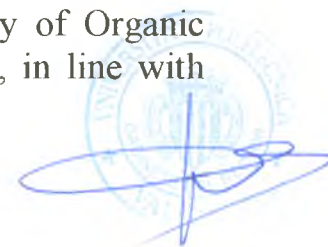
The key professional competencies that graduates acquire in the educational program “Oil and gas” include:

- Be able to assess the effectiveness and introduce new production technologies;
 - Be able to control the process and product quality, to carry out the selection of equipment and tooling;
 - To develop measures for the integrated use of raw materials and find ways to waste disposal;
 - Have the skills to evaluate the main sources of accidents and disasters, the possible causes of accidents in the workplace.
 - Have the skills to analyze the system of protection in the chemical industry and at the facilities of the economy, whose work is connected with the sources of possible chemical and bacteriological contamination.
 - Know the basic principles, methods and application of information technologies in professional activity;
 - The use of modern analytical instruments and techniques;
 - Carry out experiments and tests in the field of oil refining facilities and to carry out a scientific analysis of the data;
 - Have the skills to prepare expert reports on the technological process and the experience of their presentation.
- Formed competence will enable graduates of the master's program to carry out professional activities in the oil refineries and related industries.

To ensure an adequate level of research performance in modular educational program “Oil and gas processing” special focus is made on the formation of knowledge and skills in instrumental methods of analysis of materials and technological processes, research and innovation component.

There is no doubt that setting up a “Laboratory of refinery processes and nanotechnology” with a high degree of technical equipment to enable spectrophotometric, X-ray spectral; atomic absorption; and electron microscopy studies, is crucial.

We believe that the structure and content of educational programs of vocational Master’s program on specialty “Chemical Technology of Organic Substances” meets the needs of the labor market and employers, in line with



similar master's programs of the European educational space and allows achieving the expected learning outcomes.

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