

REVIEW

on the project of the educational scientific program of the third level of higher education, degree of higher education – Philosophy Doctor, branch of knowledge:
14 Electrical Engineering; specialization: 144 Heat Power Engineering

The purpose of the Ph. D. educational-scientific program (ESP) is to develop general and professional competencies to provide training of highly qualified personnel to solve complex problems in the domain of heat power engineering, research, analytical work, scientific consulting, and scientific and pedagogical activities.

The professional competencies of the educational-scientific program are of practical nature, and they provide a high level of professional and scientific training of graduates, contribute to a wide range of their professional activities and high competitiveness in the labor market.

The main focus of the program is the fundamental knowledge required for research in key areas of heat power engineering. At the same time, the program provides practical skills, especially important in terms of current trends in the industry, including the widespread use of computer technology, mathematical and numerical modeling, the concept of sustainable development and energy-efficient and renewable technologies.

The main competencies of students include integrated competence as the ability to solve complex problems in the professional and/or research and innovation fields of heat power engineering.

The efficiency of the educational process is ensured by its logical construction, well-thought-out and balanced structure of the program, which is based on well-known scientific principles and takes into account the current state of development of thermal engineering.

The Ph.D. level requires acquisition of skills necessary not only to solve typical industry problems, but above all the ability to solve complex and non-standard problems, including those that intersect with related disciplines (e.g., electrical engineering, economic and environmental analysis, computer science and mathematical methods). Successful solution of such problems requires the application of a scientific approach, development of new solution methods, extensive use of modern scientific literature (including, in particular, specialized scientific

journals and materials of relevant international scientific conferences), constant expansion of fundamental knowledge in the relevant major disciplines.

The proposed draft of ESP provides specialization of future doctors of philosophy in the following areas: thermal power plants; industrial and municipal heat and energy saving; modeling and information technologies in thermophysics; energy management and engineering of thermal power systems.

An important aspect of work of a Ph.D. graduate is extensive use of engineering and scientific software, both standard and adapted or designed from scratch to solve the above-mentioned problems. As a result, a specialist acquires the ability to apply their knowledge and skills to solve multidisciplinary problems, the demand for which is increasingly common in modern industry, while the number of professionals who can successfully solve them is limited. Solving such problems not only allows to meet the challenges of modern industry, but also to use these results for the development of international science, which includes presentations at professional scientific conferences and preparation of articles in specialized journals.

It is also important to note such a skill as critical thinking, which is necessary for any specialist, but in particular for philosophy doctors as specialists of the third level of higher education. Applying this skill allows to critically approach the hypotheses used and the results of the work or modeling, evaluating them in terms of adequacy, reliability and completeness, and test them using other techniques or software and/or simplified examples.

As a Ph.D. graduate of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", major 05.14.06 Technical Thermophysics and Industrial Heat Power Engineering (which corresponds to the third level of higher education with specialization in 144 Heat Power Engineering), as well as of the corresponding Ph.D. program in a related discipline of one of the leading Canadian universities (McGill University), I certify that the ESP program fully meets the requirements and all the aspects of a philosophy doctor training.

The analysis of the learning outcomes and educational components defined in the program (subjects, internships, and qualification work) allows to expect a sufficient level of qualification from the graduates of the program and the ability to solve professional issues in the field of heat power engineering, and to meet the demands of potential employers.

The ESP is aimed at intellectual youth who are interested in further scientific growth, self-realization in science and obtaining the Ph.D. degree.

The ESP contains all the necessary structural components, it reflects the modern requirements for the training of specialists in the field of thermal energy and meets the requirements of practical use.

The program has a balanced proportion of the subjects necessary for the acquisition of fundamental knowledge of the matter and additional generic competencies required for a researcher.

The sequence of subjects, the list and scope of required and free-choice subjects correspond to the structural and logical scheme of applicants training for higher education of the third (Ph. D.) level with specialization in 144 Heat Power Engineering.

Given the above, I believe that the educational-scientific program contains a sufficient list of requirements for the contents of educational activities and their results, and can be recommended for the preparation of philosophy doctors in the specialization 144 Heat Power Engineering.

Project engineer at Lasalle-NHC
candidate of technical sciences, Ph.D.



Iurii V. Lokhmanets
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