

**The evaluation report
to the educational and scientific program
"Energy Engineering" («Енергетичне машинобудування»)
for the doctoral (Ph.D.) program
on specialty 142 "Power engineering"
at Odessa National University of Technology**

The educational-scientific program "Energy Engineering" of the third level of higher education in the specialty 142 "Energy engineering" (branch 14 "Electrical engineering") has been successfully developed by the working groups of the Department of Cryogenic Engineering and the Department of Refrigeration and Air Conditioning at the Institute of Refrigeration, Cryotechnology and Ecoenergetics, Odessa National University of Technology. The need for high-level specialists in this field is currently felt in Ukraine; therefore, the program is actual. The educational-scientific program "Energy Engineering" provides the platform for obtaining the required competencies, knowledge, and skills.

The educational program reflects the prerequisites, orientation, and main focus of the entire doctoral program. The number of ECTS credits is sufficient for obtaining the level of Doctor of Philosophy. A list of general and professional competencies, normative and variable content, learning outcomes, and requirements meet the requirements established by the Ministry of Education and Science of Ukraine.

The catalog of disciplines has been well designed, considering the educational, scientific interests, and practical needs of the Ph.D. candidates conducting their research in different departments. The competencies and expected learning outcomes provided by this educational program meet modern requirements for training highly qualified scientific personnel. The educational and scientific program presented for feedback provides the applicant with a full-fledged acquisition of theoretical knowledge, abilities, skills, and other competencies sufficient for solving complex problems in the field of professional and research-innovative activities, developing the scientific methodology and pedagogical activities, conducting own scientific research.

It is my pleasure to see that the basic discipline within the educational-scientific program is "Modern methods of multi-criteria analysis and optimization of the energy conversion systems". This module (3 ECTS) has been developed under the solid scientific collaboration between colleagues from the Department of Cryogenic Engineering and my research group (Exergy-based Methods for Refrigeration Systems). Through multi-criteria analysis, the real thermodynamic inefficiencies, their costs, and environmental impacts are identified together with their causing sources. Finally, the comprehensive multi-criteria evaluation results can be generated and evaluated. The unique results obtained from these

Fakultät III /
Faculty III
Prozesswissenschaften /
Process Sciences

Institut für Energietechnik/
Institute for Energy Engineering

Prof. Dr. Tetyana Morozyuk

*Geschäftsführende Direktorin/
Director of Institute*

Fachgebiet
"Exergiebasierte Methoden für
kältetechnische Systeme" /
Chair of "Exergy-based methods for
refrigeration systems"

Sekretariat KT 1
Marchstr. 18
10587 Berlin

Telefon +49 (0)30 314-24765
Telefax +49 (0)30 314-21683
tetyana.morozyuk@tu-berlin.de
www.tu.berlin.de/ebr

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analyses allow engineers to better understand, improve or optimize the design and operation of energy conversion systems.

Evaluating the educational and scientific program "Energy Engineering" allows me to conclude that it meets the requirements for training specialists of the third (educational and scientific) level of higher education in the relevant specialty and can be applied to the educational process.

Sincerely,



Technische Universität Berlin
Institut für Energietechnik
- Sekr. KT 1 -
Marchstraße 18
D-10587 Berlin
Telefon: (0 30) 3 14 - 2 21 81
Telefax: (0 30) 3 14 - 2 16 83

Prof. Dr. Tetyana Morozyuk
Recipient of ASME Potter Award 2021
Dual Editor-in-Chief of ASME Journal of Energy Resources Technology