

Profile of the Educational Program

General information	
The official name of the educational program	Chemical Technology and Engineering
Specialization	161 Chemical Technology and Engineering
Area of expertise	16 Chemical and Bioengineering
Degree of higher education and title of qualification in the original language	Bachelor in Chemical Technology and Engineering
Type of diploma and scope of the educational program	Bachelor's Diploma, single, 240 ECTS credits, term of study 3 year 10 months
Accreditation availability	Not accredited (introduced in 2020)
Cycle / level	First (bachelor's) level NQF of Ukraine – level 7 FQ-EHEA – First cycle EQF-LLL – 6 level
Requirements for the level of education of the entrant	Availability of complete general secondary education
Language (s) of teaching	Ukrainian
Duration of the educational program	5 years
Purpose of the educational program	
	<p>Training of specialists capable of working in the field of chemical technology, able to solve specialized problems and practical problems in the field of chemical technology or in the education process, which involves the application of certain theories and methods of science and is characterized by complexity and uncertainty.</p> <p>The program is designed in accordance with the mission and strategy of the university, which is to train highly qualified personnel for regional development and urban management.</p>
Characteristics of the educational program	
Subject area	<p>Objects of study and activity – technological processes and apparatus for the production of chemicals, as well as materials and products based on them.</p> <p>The purpose of training is to acquire competencies sufficient to solve scientific, specialized and practical problems related to the development and production of chemicals, as well as materials and products based on them.</p> <p>Theoretical content of the subject area – the concepts and patterns of natural and physical-mathematical disciplines, physical-chemical bases of chemical production, conceptual principles of implementation of technological processes.</p> <p>Learning objectives – the use of acquired competencies to continue training at the second "Master's" level or to perform production functions at the enterprises of the relevant industry as a technological engineer.</p>

	<p>Methods of chemical, physical-chemical and instrumental analysis of raw materials, intermediate and target products; technologies of preparation and processing of raw materials into the final product, information and computer technologies.</p> <p>Tools, devices, means of automation, for research of technological processes, raw materials, intermediate and target products and management of technological process; main and auxiliary equipment of relevant technological processes.</p>
Orientation of the educational program	Educational and professional
Main focus of the educational program and specialization	<p>General education in the field of Chemistry and Chemical technology, specialty 161 Chemical technology and engineering</p> <p><i>Keywords:</i> Chemistry, general chemical technology, chemical and bioengineering, processes and apparatus of chemical production, physicochemical research methods, composite materials, paints, ceramics and glass materials, nanocomposites, fillers, pigments, additives, oligomers, coatings, design of composite, ceramic and glass materials.</p>
Features of the program	no
Suitability of graduates to employment and further education	
Suitability for employment	<p>Employment at enterprises, state institutions and private companies, research institutions of chemical, construction, pharmaceutical, machine-building industries.</p> <p>Graduate Career Opportunities (according to the Classifier of Occupations DK 003: 2010):</p> <p>3119 technologist;</p> <p>3119 trainee researcher;</p> <p>3111 technician-technologist;</p> <p>3116 electrochemical protection technicians;</p> <p>3116 technicians (chemical technologies);</p> <p>3116 technician laboratory assistant (chemical production).</p>
Further education	Obtaining a master's degree
Teaching and assessment	
Teaching and learning	Teaching and learning includes lectures and practical classes, self-study, individual consultations with teachers, practice and qualification work of a bachelor in the use of modern educational pedagogical technologies, student-centered education.
Assessment	Oral and written survey, current and final control of knowledge, test tasks, graphic works, term papers and projects, reports on practices, written examinations, differential tests, defense of qualification work (bachelor's degree).
Program learning outcomes	
Program learning outcomes, defined by the standard of higher education specialty	<p>PLO 1. Apply the acquired knowledge and understanding of the subject area and sphere of professional activity in practical situations.</p> <p>PLO 2. To communicate freely in the state and foreign languages orally and in writing on professional issues, to form different types of professional documents in accordance with the requirements of the culture of oral and written speech.</p> <p>PLO 3. Be aware of the responsibility for the quality of work performed, ensure the task at a high professional level.</p>

PLO 4. Understand and honestly perform their part of teamwork; determine the priorities of professional activity.

PLO 5. Analyze risks in the field of professional and daily activities, develop effective measures to preserve human life and health, or selected from the standard of the specialty.

PLO 6. Apply the basic provisions of higher mathematics, physics, chemical disciplines in chemical technology.

PLO 7. Apply the basic concepts of mathematical analysis, linear algebra, discrete mathematics and differential equations in chemical technology.

PLO 8. Formulate and solve problems of mathematical physics, solve systems of linear algebraic equations

PLO 9. Have methods of numerical differentiation and integration for experiment planning.

PLO 10. Plan and conduct physical and chemical experiments, process the results and estimate the error.

PLO 11. Use the theoretical provisions of chemical science to analyze the thermodynamics and kinetics of chemical reactions for the regulation of the technological process;

PLO 12. Evaluate the results of quantitative analysis of model solutions using appropriate methods, chemical and physical-chemical methods of analysis, chemical equipment.

PLO 13. Apply physical-chemical and instrumental methods of analysis of raw materials and products in chemical technology.

PLO 14. To formulate the position of physical chemistry of dispersed systems and the essence of surface phenomena, composition and structure of solid phases in interfacial boundary layers. Analyze the properties of surfactants and their role in technological processes.

PLO 15. Apply fundamental and applied aspects of chemical technologies in the production of organic substances. Know the basic methods of calculating organic reactions and evaluate the mechanism, stability and energy of chemical reactions, be able to choose methods for calculating organic compounds and draw conclusions about their structure.

PLO 16. Evaluate and summarize the importance of heat and mass transfer, chemical and energy processes in the production of basic chemical products.

PLO 17. To analyze technological schemes, to carry out calculations of the basic constructive parameters of the standard equipment and knots and to choose devices at designing of chemical manufactures.

PLO 18. Define the purpose, tasks and stages of design. Be able to calculate the material and energy balances of chemical industries.

PLO 19. To formulate the general tendencies of development of the newest chemical technologies in the advanced countries, to estimate efficiency of the advanced chemical technologies.

PLO 20. To control and manage the processes of automation of parameters of technological schemes in the production of materials.

PLO 21. Apply methods of mathematical modeling and optimization in the development of scientific and technical projects. Establish the connection of the obtained data with the results of mathematical modeling and optimization of chemical and chemical-technological processes.

PLO 22. To determine the components of the cost of production and to determine ways to reduce it through resource and energy savings. Apply technical and economic calculations of efficiency and safety of design decisions and their consequences for the short and long term in chemical technology.

	<p>PLO 23. Establish and evaluate the most effective methods and techniques in practical production activities and make adjustments to the technological mode of production depending on the quality of raw materials.</p> <p>PLO 24. To determine the efficiency of rational use of raw materials, energy resources and equipment in production. To control technological parameters and indicators of final products.</p> <p>PLO 25. Apply the results of research work in the production-technological and scientific laboratory of the enterprise or scientific institution.</p>
<p>Programmatic learning outcomes, defined by the institution of higher education</p>	<p>PLO 26. Apply the categorical apparatus of psychology in the system of professional training and practical activities; take into account the main mental, socio-psychological and psychophysiological manifestations of personality; to perceive scientifically substantiated psychological interpretation of structural elements of personality psyche; to be aware of one's own mental sphere; analyze various activities.</p> <p>PLO 27. Apply skills of conflict management in professional activities, tools and strategies for their regulation and resolution.</p> <p>PLO 28. It is reasonable to use the basic principles, laws and rules of logical thinking in scientific knowledge and professional activity.</p> <p>PLO 29. Effectively communicate in a foreign language in the business environment.</p> <p>PLO 30. Apply the basic principles and methods of sociological science in solving professional problems.</p> <p>PLO 31. Analyze the features of cultural processes in the modern world; make a comparative description of the main cultural centers of the modern world; analyze the patterns of cultural development of mankind; draw historical parallels between the current cultural situation and the historical past.</p> <p>PLO 32. To substantiate the moral principles of social and professional relations on the basis of a categorical analysis of ethical theories; to form a conscious sense of responsibility and moral self-improvement; to make compromise decisions when carrying out joint activities through ethical reflection; analyze artistic sources in the context of modern aesthetic theories; to determine the artistic features of the cultural development of European civilization; the ability to express and justify their position on the values of the artistic heritage of mankind.</p> <p>PLO 33. Have basic methods of intellectual property protection and apply the rules of registration of intellectual property rights.</p> <p>PLO 34. Carry out professional communication: create communicative products, analyze communicative activities; adequately respond to criticism, generate and argue new ideas; to exert a communicative influence on people, motivating them to activity; to prove one's own thoughts; identify, apply information and communication technologies; to develop skills of interpersonal interaction in the team.</p> <p>PLO 35. Apply language, speech, linguistic, socio-cultural and communicative skills for effective communication in a foreign language.</p> <p>PLO 36. Have knowledge of the principles, methods, technologies of creating new materials in the fields of chemistry, biotechnology, medicine.</p> <p>PLO 37. To improve the professional level by acquaintance with the latest scientific and technical information in the direction of development of chemical technologies and the modern equipment at manufacturing of materials on a specialty; professionally search for such information using the appropriate software.</p>

	<p>PLO 38. Apply knowledge for the analysis of scientific and technical foreign literature in the specialty and communication in a foreign language for professional purposes.</p> <p>PLO 39. To develop and analyze chemical compounds in solid phase and solutions to perform the technological process; to study the properties of dispersed systems, resistance to coagulation of colloidal systems in relation to technological factors.</p> <p>PLO 40. To identify the influence of the mechanism of action of functional chemicals on the processes of formation of polymeric materials; use standard laboratory equipment and measuring equipment, standard methods and equipment, instructions and reference data in the conditions of a chemical laboratory or chemical production.</p> <p>PLO 41. Predict and calculate the composition, physical and chemical properties of chemical compounds for the preparation of technological documentation, select and apply methods of automation of technological processes and equipment and parameters of the technological process of production of basic chemical products;</p> <p>PLO 42. Carry out a comprehensive assessment of materials and draw up results in accordance with the requirements of certification and standardization of materials and products for product quality control or technology examination;</p> <p>PLO 43. Apply the theoretical foundations of crystallography of mineralogy and physical chemistry of silicates for forecasting and calculating the composition, physical and chemical properties of raw materials, molding compounds and charges in the production of silicate materials.</p> <p>PLO 44. To analyze chemical technologies of ceramics, glass, binders and refractories, to estimate influence of technological and physical and chemical factors on structure and properties of ceramic and glass materials.</p> <p>PLO 45. Use the principles of selection of raw materials, materials, energy resources, processing methods and equipment, taking into account the increased requirements for environmental protection in order to determine their most economical composition. ШРИФТ 12!!!</p>
Resources for program implementation	
Staff assistance	The qualitative level of professional training of bachelors is ensured by the qualified scientific and pedagogical staff of the department, which includes doctors and candidates of sciences, professors, associate professors, member of the European Federation of Chemical Engineering CFE-UA. All teachers of the department have a strong practical experience in the field of chemical technology.
Materiel and technical support	<p>The educational process is fully provided with the auditorium fund, administrative and auxiliary facilities.</p> <p>Classes in the curriculum for bachelors are held in 9 classrooms, 4 of which are equipped with stationary multimedia equipment, in the laboratory of varnishes, paints and paints PVC-Lab for research according to European standards, 3 laboratories of the regional center of ceramics "CENTRE CERAMIC LABORATORY" 2 specialized computer laboratories.</p> <p>The educational process in all disciplines is provided with visual aids (presentations to lecture material, posters, diagrams, tables, models, samples, collections, etc.), the necessary technical and technological equipment.</p>
Methodological	All educational components of the educational program Design are

support	<p>provided with the following educational and methodological materials: textbooks; tutorials; lecture notes; methodical instructions and recommendations; individual tasks; collections of situational tasks (cases); Examples of solving typical tasks or completing typical tasks computer presentations; illustrative materials; resource directories and more.</p> <p>All teaching materials are available to students in the reading rooms of the Scientific Library http://library.kname.edu.ua/index.php/en/, including in the Information Room equipped with computers with Internet access and the University's local network, in the digital repository http://eprints.kname.edu.ua, on the portal of the Distance Learning Center http://cdo.kname.edu.ua/</p>
Academic mobility	
National Credit Mobility	In accordance with the Regulations on Academic Mobility of Students, Graduate Students, Doctoral Students, Scientific-Pedagogical and Scientific Workers of O.M. Beketov NUUE
International Credit Mobility	<ol style="list-style-type: none"> 1) Middle East Technical University, Ankara, Turkey (METU) 2) Aristotle University, Thessaloniki, Greece 3) University of Nova Gorica, Slovenia 4) Estonian University of Natural Sciences, Tartu, Estonia 5) Lodz Technical University, Lodz, Poland
Training of foreign higher education applicants	In accordance with the Rules for admission to training before O.M. Beketov NUUE