

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
TERNOPIL VOLODYMYR HNATIUK NATIONAL PEDAGOGICAL
UNIVERSITY**

EDUCATIONAL AND PROFESSIONAL PROGRAM

**THE SECOND (MASTER'S) LEVEL OF HIGHER EDUCATION
IN SPECIALTY 101 ECOLOGY**

THE FIELD OF KNOWLEDGE 10 Natural sciences

**QUALIFICATION: Master of Ecology. Specialist in environmental
protection and environmental management**

**Profile of the educational and professional program
in specialty 101 Ecology**

1 - General information	
Full name of higher educational institution and structural unit	Ternopil Volodymyr Hnatyuk National Pedagogical University, Department of Geoecology and Methodology of Teaching Ecological Disciplines
The degree of higher education and the name of the qualification in the language of the original	Master of Ecology. Specialist in environmental protection and environmental management
The official name of the educational program	Educational and professional program “Ecology” of the second (Master's) level of higher education
Type of diploma and the volume of the educational program	Master's degree, unitary, 90 ECTS credits, term of training 1 year 4 months
Availability of accreditation	
Cycle/Level	NRC (NQF – national qualifications framework) of Ukraine – level 7, FQ-EHEA – second cycle, EQF-LLL – level 7
Prerequisites	Availability of the bachelor's degree
Teaching language(s)	Ukrainian
The duration of the educational program	5 years
Internet address of the permanent description of the educational program	
2 – The purpose of the educational program	
Formation of general and professional competencies for the fulfillment of professional tasks and duties of educational and innovative character in the field of modern ecology and methodology of higher education, the ability for independent research in various institutions and organizations, pedagogical activities in higher education institutions and organizational and managerial activities in public authorities.	
3 – Characteristics of the educational program	
Subject area (branch of knowledge, specialty, specialization)	10 Natural sciences 101 Ecology

Orientation of the educational program	Educational and professional master's degree program is applied; the structure of the program involves dynamic, integrative and interactive learning. The program offers an integrated approach to educational activities and implements it through studying and practical training. Disciplines and modules included in the program are focused on the actual directions, within which further professional and scientific career of the applicant is possible.
The main focus of the educational program and specialization	General program. The emphasis is on acquiring skills and knowledge on environment and environmental protection, which involves specific employment and the possibility of further education and career growth.
Peculiarities of the program	The program provides the opportunity to receive a double diploma within the framework of existing agreements on cooperation of the University with leading foreign educational institutions, internships at enterprises and organizations. Agreement on cooperation (on semester academic exchange) with Yan Dlugosh Academy in Czestochowa (Poland) The peculiarities lie in expanding the spectrum of forms of acquisition and development of competencies, which include: conducting current interdisciplinary scientific studies, preparing together with teachers methodical recommendations for conducting classes in specialized disciplines, conducting workshops in specialized disciplines in order to get acquainted with the latest methods and technologies of research in geography
4 – Eligibility of graduates for employment and further training	
Eligibility for employment	2320. Teacher of a vocational school 1142.3 Senior official (chairman, co-chairman, secretary general, president, vice president, secretary general, secretary) of the

	trade union 1143.4 Senior official of a public organization (in the field of culture, education, charity, human rights, etc.). 1121.1 Chief naturalist 2419.3 State auditor 1210.1 Director of an educational institution, an out-of-school institution, an educational center (secondary school, a specialized school, a gymnasium, a boarding school, etc.). 4115 Faculty dispatcher 2211.2 Ecologist 4411.2 Environmental auditor 1222.2 Head of treatment facilities 1237.2 Head of the laboratory (scientific and research) 1229.6 Head of the park of culture and rest 2149.2 Environmental engineer 2213.2 Environmental protection engineer. Animal protection engineer 3449 State inspector 3212 Inspector for nature conservation 3340 Laboratory assistant (education) 1494 Manager (manager) of environmental systems 1412 Manager of nature use 3251.2 Methodist 2141.1 Junior researcher (urban planning) 2213.1 Scientific Researcher-Consultant (Agronomy, Zoo Engineering, Forestry, Nature Reserve Affairs) 2148.2 Specialist in geosystem monitoring of the environment 2213.2 Specialist in environmental education 2419.2 Specialist in economic modeling of environmental systems 2442.2 Specialist in environmental management
Подальше навчання	FQ-EHEA – third cycle, EQF-LLL – level 8, NRC (NQF - national qualifications framework) of Ukraine – level 8

5 - Teaching and assessment	
Teaching and studying	Student-oriented studying, self-studying, problem-oriented studying, practice with the use of general and special and scientific methods (spatial analysis, economic, sociological). Combination of lectures, practical classes, solution of situational tasks, trainings, case studies, projects implementation, research works, e-learning in the system "MOODLE".
Assessment	Oral and written test control; presentation of works, defence of thesis; credits, exams. The assessment is based on the national scale (excellent, good, satisfactory, unsatisfactory, or credited, not credited), 100-point scale and ECTS scale (A, B, C, D, E, F, FX). The assessment of undergraduates is consistent, clear and conducted in accordance with the established procedures.
6 - Program competencies	
Integral competency	The ability to comprehensively solve complex unpredictable tasks and problems in educational work in the spheres of regional development, nature management, nature protection activities, urban and district planning.
General competencies	GC1 The ability to use knowledge and skills acquired in the process of learning a foreign language, in relations with contractors and in the processing of foreign sources of information. The ability to present their own and collective results of professional and research activities in a foreign language; GC2 The ability to professionally communicate and translate from foreign sources of information from ecological sphere. To present the results of research activities in accordance with international requirements. To know and apply the standards of oral business and scientific communication with foreign partners and colleagues, requirements for documentation; GC3 To carry out the philosophical and theoretical generalization of research problems,

	to analyze scientific and philosophical pictures of the world, their theoretical components; GC4 To apply professional scientific knowledge in philosophical comprehension of problems and prospects of civilization, its technogenic and social factors. To apply philosophical methodologies in the analysis of phenomena and processes that constitute the object and subject of scientific research; GC5 Knowledge of principles, methods and organizational procedures of scientific activity, general scientific (traditional, modern), concrete scientific (interdisciplinary, special) methods of research, understanding of causal relationships of development of society and the ability to use them in professional and social activities; GC6 The ability to use the normative and legal and organizational foundations of educational process in institutions of higher education; GC7 The ability to communicate with experts and experts of different level of other branches of knowledge. Ability to collective action and organization of interaction in the team. Ability to work in a cultural environment to ensure successful interaction in the field of science and education; GC8 The ability to work independently, independently act from the standpoint of social responsibility, take an active life position and develop leadership qualities; GC9 The ability to apply modern methods and methods of scientific research. Ability to innovate, to critically analyze one's own scientific and applied activities; GC10 The ability to use the basics of pedagogical activity, didactics of high school, traditional and innovative forms of teaching and pedagogical technologies, scientific organization of work of the teacher of higher education; GC11 Professional skills of preparation and conducting of lectures, seminars (practical) classes, use of active methods of training,
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	organization of independent and research work of applicants and assessment of their knowledge; GC12 The ability to study and master modern knowledge. GC13 The ability to design and manage projects.
Professional competencies	PC1 The ability to use indicators of sustainable development to substantiate decisions related to the development of social and economic systems; PC2 The ability to apply the principles and laws of the state policy in the field of environmental protection and rational use of nature; PC3 The ability to analyze existing natural complexes, models of nature use for the purpose of sustainable development of regions; PC4 The ability to apply knowledge of regional development to develop specific instruments of regional environmental policy; PC5 The ability to solve a wide range of environmental problems and tasks by understanding their fundamental principles and using both theoretical and experimental methods; PC6 The ability to analyze objects and processes of both natural origin and anthropogenic in terms of fundamental principles and knowledge of natural sciences, as well as on the basis of appropriate methods; PC7 Knowledge of means of conducting environmental control and environmental monitoring of the state of the environment; PC8 Knowledge of the basic principles of the state policy in the field of environmental control. Knowledge of the means of conducting environmental monitoring of the state of the environment, including technical ones; PC9 The ability to use methods of system analysis and construction of formal models of complex systems. To have practical skills in

	obtaining and visualizing information on the current state of various environmental components; PC10 The ability to form a system of ecological management and procedures for managing the activities of enterprises, constituents of ecological management, functions, tasks of environmental management bodies; PC11 Possession of basic ideas about global and regional problems of humanity, which help to understand the causal relationships of development of society and their ability to use in professional and social activities; PC12 The ability to use and apply in the professional activity the provisions of national and international environmental safety legislation; PC13 Knowledge about the factors of the impact of environmentally hazardous phenomena and processes on human health, the ability to use them to determine the social consequences of man-made changes in the state of the environment; PC14 Knowledge of the manifestation of environmental hazards in different environments. Knowledge of methods for determining the sources and ways of entering into the environment of harmful components and the ability to evaluate their impact on human health and the quality of the environment; PC15 The ability to independently plan, organize and conduct experimental research. The ability to analyze and select appropriate measurement tools for conducting experimental research in the field of environmental safety; PC16 The ability to conduct research on technogenically-modified landscapes for scientific substantiation of managerial decisions in order to ensure the stability of these landscapes; PC17 The use of knowledge of the modern branch problems concerning the optimization of
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	the state of nature management, knowledge of the principles of integrated management of natural resources; PC18 Knowledge of the causes and nature of extraordinary natural and man-made situations. Skills of use of environmental technologies, which allow to minimize man-made influences on natural systems; PC19 Knowledge of the traits of the nature use of certain regions of the world, Ukraine and its locality. Adaptation of the acquired knowledge in practice of optimization of natural and natural-economic systems; PC20 The ability to use modern methods of environmental protection, the principles of integrated protection of natural ecosystems and human society from environmentally hazardous natural and man-made processes (phenomena); PC21 Knowledge of psychological and pedagogical aspects of ecological education, ways of forming ecological culture of consciousness among the population; PC22 The ability to use principles of preservation of biotic and landscape diversity, when developing ecological network projects; PC23 Modern awareness of national and international programs and legislation on the formation of eco-networks of different levels of organization. Use of knowledge about the principles of spatial differentiation of various categories and objects of the NRF in a certain area; PC24 Have an idea of monitoring of air, natural waters, soils and the state of biota. The ability to use mathematical knowledge for statistical processing of data on environmental observations and modeling of phenomena and processes occurring in it; PC25 The ability to organize a separate collection of solid domestic waste of the territory, their re-use, recycling. Knowledge of international experience in dealing with solid
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	household waste and the main problems of their utilization in Ukraine. PC26 The ability to use the environmental standardization, certification, licensing in the field of nature use. Knowledge of the main approaches to the economic assessment of natural resources and the calculation of the payment for environmental pollution; PC27 The ability to develop a landscape design and arranging the territory and taking into account the geoecological parameters of the environment. Knowledge of the basic approaches to the organization and visualization of different types of landscapes; PC28 The ability to use specialized software (programming languages, packages) for mapping natural, social phenomena and processes and environmental research; PC29 The ability to formulate modeling tasks to create models of objects and processes in the environment and its components and using mathematical, cartographic methods and geoinformation technologies; PC30 The ability to analyze and evaluate the state of the environment through geographic information systems and technologies. Skills work in computer networks, the use of modern information technology and software; PC31 The ability to prove knowledge and own conclusions to specialists and non-specialists; PC32 The ability to manage the strategic development of the team in the process of carrying out professional activities in the field of ecology, environmental protection and sustainable use of nature; PC33 The ability to independently develop environmental projects through the creative application of existing and generation of new ideas.
7 - Program outcomes of studying	
	POS1 To know the grammatical features of scientific and pedagogical literature in a

	foreign language, the rules for writing annotations in a foreign language, letters of recommendation, annotations and abstracts of scientific and educational materials. To carry out high-quality translation of scientific texts, taking into account the specifics of specialty, to know the specifics of editing scientific texts, in particular branch; POS2 To present the results of research activities in accordance with international requirements. To know and apply standards of oral business and scientific communication with foreign partners and colleagues, requirements for documentation. To freely, logically and accurately express opinion in accordance with the content, conditions of intercultural communication. POS3 Analyze conceptual representations of philosophy on the essence and development of science. To find and apply a philosophical toolkit, to perform a theoretical analysis of scientific ideas and facts; POS4 To single out regularities of constructing rational world outlook, anthropoid image of the world. To evaluate dynamical models of the world of the device, to formulate an argumentated position in questions of scientific outlook; POS5 To interpret texts of philosophical culture on subjects related to the nature of science, its problems and perspectives. Apply the philosophical experience in the process of scientific research; POS6 To logically structure the contents of the educational material. To modify structured training and work syllabus. To conduct different kinds of lectures on didactic purposes, on functional grounds, on the nature of their structure. To apply techniques to create problem situations. To have the skills to use different materials, namely, electronic publications, resources and teaching materials to improve the efficiency of the learning process;
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	POS7 To apply modern educational technologies. To ensure the implementation of a developing, coordinating, managerial function of a teacher in a higher educational institution. To use the normative, legal documents in the activities of the teacher, conduct classes with the use of various technologies, methods, techniques and means of training in accordance with the age and individual characteristics of the students, apply different types and forms of organization and conduct of classes, conduct psychological and pedagogical analysis and self-analysis of the classes; POS8 To allocate modern methods and methods of scientific research, to set and solve perspective scientific research and applied tasks; POS9 To describe the general characteristics of scientific projects, the system of intellectual property and, in particular, industrial property in the inventive and patent-licensing activities. To apply international cooperation in the field of intellectual property. To promote the protection of intellectual property rights in the management of scientific projects; POS10 To determine the object, purpose and statement of tasks of scientific research. To analyze scientific and technical information on selected topics of scientific research. To be able to plan, organize and conduct comprehensive environmental studies. POS11 To apply the requirements of international environmental standards for environmental management systems, principles of corporate social responsibility, application of environmental audit, certification of production, evaluation of environmental performance, and its quality. POS12 To have an idea of ways of pollutants origin. To possess the methods of estimating anthropogenic impact on the state of the environment. POS13 The ability to carry out a comprehensive
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	ecological study of the territory, to provide ecological, socio-economic evaluation of the development of regions, to reveal the specifics of regional development, to characterize the level of development of individual states; POS14 The ability to evaluate the resource potential of the territories for the purpose of further optimization of nature use. To be able to calculate local, regional indicators and indices of sustainable development for the analysis of the state (level of development) of socio-economic systems; POS15 To conduct analysis, synthesis, creative thinking, evaluation and systematization of various information sources about the state of components of the environment. POS16 To explain the organization and methodology of problem research from the point of view of system analysis, taking into account the choice of objectives, scenario review and situation assessment. To apply basic concepts, principles and technologies of system analysis and formal models of complex systems; POS17 To develop and implement mechanisms of territorial eco-management, planning, monitoring of regional development, plans and programs. To be able to plan, implement, monitor and analyze the work of environmental management systems in order to further certification. POS18 To be able to formulate the environmental policy of an enterprise and organize its availability and declaration to all stakeholders for timely correction and consistent improvement. POS19 To model natural objects and processes, use cartographic and mathematical methods and geoinformation technologies; POS20 To present the results of integrated research in the field of ecology and environmental protection using modern
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	cartographic and graphic methods. To describe the functions, composition and capabilities of modern software, the principles of its organization and application. POS21 To perform selection, analysis, presentation and dissemination of environmental information, using various written, oral and visual means (including the use of digital technologies); POS22 To be able to determine the structure and functions of modern GIS and their applicability, to have the main characteristics of GIS components and methods of formalizing spatial information. To be able to use basic GIS packages to solve environmental problems. To be able to analyze and evaluate the state of the environment with the help of geographic information systems and technologies; POS23 To formulate methods for measuring physical quantities. To choose the technical means of scientific research, the main means of measuring the indicators of environmental hazards. To allocate areas of application of devices and measuring complexes. To establish basic methods of measuring information; POS24 To identify existing environmental hazards in the natural and anthropogenic environments. To analyze the main ways to prevent the emergence of environmentally hazardous situations in the course of any human activity. To determine the possibility and nature of the manifestation of violations of environmental safety in various environments and industries and to provide recommendations for their prevention and minimization. POS25 To be able to estimate landscape and biotic diversity and analyze the consequences of anthropogenic impact on the natural environment; POS26 To determine characteristics, balance, causes of environmental state disruption. To
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	present the basics of modeling processes of environmental pollution, boundary conditions of anthropogenic loading; POS27 To be able to plan and organize measures for the protection of the population and production personnel from the consequences of accidents, catastrophes, natural disasters, to organize the actions of the formations during the rescue work; POS28 To be able to organize the sorting of solid domestic wastes, to know the basic technologies of their utilization and recovery, to carry out the restoration and cultivation of the landscape.
8 - Resource support for the implementation of the program	
Personnel support	Educational process is provided by 5 doctors of sciences, professors; 6 candidates of sciences, associate professors, 1 Ph.D., a teacher. The program is aimed at attracting scientific and pedagogical staff of the university with academic degrees and / or academics, as well as highly skilled specialists. For the purpose of raising the professional level all scientific and pedagogical workers undergo an internship once every five years.
Material and technical support	The implementation of programs of study disciplines is fully ensured by the material and technical equipment of offices and laboratories, the main list of which includes: a cabinet of safety and health and safety, computer rooms, specialized training and training laboratories and offices, which create conditions for students to acquire special competencies from the specialty 101 Ecology.
Information and studying and methodological support	- the official site of TNPU: tnpu.edu.ua - scientific library: www.library.tnpu.edu.ua - distance learning system: elr.tnpu.edu.ua
9 - Academic mobility	
National Credit Mobility	Training of masters in the credit transfer system. The volume of one credit is 30 hours.
International Credit Mobility	Agreement on cooperation (on semester academic exchange) with the Yan Dlugosh

	Academy in Czestochowa (Poland)
Studying of foreign applicants for higher education	No

2. List of components of the educational and professional program and their logical consistency

2.1. List of components of educational and professional program

Code / №	Components of the educational program (educational disciplines, course projects (works), practice, qualification work)	Number of credits	Assessment form
1	2	3	4
OBJECTIVE COMPONENTS OF EDUCATIONAL PROGRAM			
OC1	Foreign language (for professional direction)	4	Exam
OC2	Philosophy of science	3	Credit
OC3	Pedagogy and psychology of higher education	3	Credit
OC4	Methodology and organization of scientific research	3	Exam
OC5	Sustainable development strategy	4	Exam
OC6	System analysis of the quality of environment	6	Exam
OC7	Ecological management and audit	3	Exam
OC8	History and methodology of environmental science	3	Credit
OC9	Geoinformation systems in ecology	3	Credit
OC10	Preparation of master's thesis	6	Exam
Total amount of objective components:		25	
SELECTIVE COMPONENTS OF EDUCATIONAL PROGRAM			
SC1	Global and regional environmental problems	4	Exam
SC2	Radioecology and foundations of radiation protection	3	Exam
SC3	Conceptual and applied principles of nature management	12	Credit Exam
SC4	Geological ecology	3	Credit
SC5	Ethnic ecology	3	Credit
SC6	Ecological culture	3	Credit
SC7	Scientific principles of formation of ecological networks	3	Exam
SC8	Regional environmental monitoring	4	Exam
SC9	Recycling and recovery of solid household waste	3	Credit
SC10	Ecological economy	3	Credit
SC11	Landscaping	3	Credit
SC12	Scientific and production practice	8	Credit
Total amount of selective components:		52	
GENERAL AMOUNT OF THE EDUCATIONAL PROGRAM 90			

3. Form of certification of higher education applicants.

Certification of graduates of the educational program "Ecology" in specialty 101 Ecology is conducted in the form of the defence of the master's thesis and a comprehensive exam (ecological management and audit; methodology of environmental research, methodology of teaching of professional environmental disciplines in institutions of higher education) and ends with the issuing of document of the established model for awarding him a master's degree with a qualification: Master of Ecology in the specialization of environmental protection and environmental management.

The certification is carried out openly and publicly.