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## **Professional competence of bachelors and masters ecologist**

Accession of Ukraine to the purposes and principles of the Bologna process (to ensure quality educational level professionals, their compliance with training requirements of the international labor market) reinforces the urgency of question of professional competence of future professionals. Strengthening European cooperation in vocational education and training specialists declared and accepted by the Council of Ministers in Copenhagen Declaration vocational education and training in 2002. Reforming higher education in Ukraine requires new approaches to the educational process in the formation of professional competence of ecologists. Extremely important is the urgent need to improve the level of environmental education, culture and consciousness for professionals, and professional implementation at all levels.

Currently, the main priorities of environmental policy in education is to train highly qualified personnel with advanced professional competencies capable of adaptation and self-realization in terms of ecological agriculture. The main objectives of national environmental policies aimed at addressing problems in the field of environmental education are: improvement of environmental education with the focus on the principles of sustainable environmental and sustainable development; establishment of national environmental information and public education, including socially-oriented information and teaching environmental education centers in the exchange of experience; improving vocational training environmental officers of institutional organs of management; improving management information on environmental and sustainable development including environmental education community by introducing eco-educational and educational programs, and continuous disclosure of environmental and economic security.

Problems of training highly qualified specialists with high professional competence explored domestic and foreign scientists. General questions training series in the works O. Aleksyuka, S. Goncharenko, I. Zyazyuna, V. Luhovoho, V. Sydorenka, M. Stepka et al [Степко 2009; Зязюн 2005]; basis for understanding the formation of professional skills and scientific heritage is A. Belyaev, A. Boiko, I. Ivanova, L. Prussovoyi, H. Selevka, F. Taylor and others [Іванов 2008]; problem analysis and development of professional competence of the modern specialist and

its components highlights V. Huthmacher, D. Ravenom, S. Goncharenko, N. Kolominskym, A. Markovoyu et al [Маркова 1996; Равен 2002].

The purpose of the article is to develop professional competence of environmental higher education in Ukraine. Objective – to analyze the philosophical, psychological, pedagogical, methodological and special ecological literature on the current state of treatment of professional competence; summarize the features to consider specific content training ecologists in developing professional competencies for bachelors and masters.

The presentation of basic materials research. The main reason for the development of professional environmental education is awareness of the need for change in educational paradigm for contemporary and future society and ensure its sustainable development, orientation of the economy to preserve the environment in all spheres of human activity on various types of natural resources at all levels of institutional management in the implementation of environmental policy. Professional environmental education involves the transition of economic and socially oriented model of learning, based on must be fundamental and applied interdisciplinary environmental knowledge and scientific and practical abilities and skills, based on ecosystem approach to integrated development of society, allow you to make and implement environmentally-oriented management solutions from local to global purpose to improve the quality standard of living that does not threaten the environmental security of the environment and ability of future generations to meet their needs without disturbing the natural equilibrium. The main goal of the professional environmental education is the formation and development of a continual life-long education, ensure that the rapidly changing demands of the XXI th century, social, economic and environmental needs of the region and the country as a whole needs of the individual, society, state and beyond.

We have developed professional competence for bachelors (Table 1) and Masters (Table 2) Ecologists in Ukraine.

**Table 1**  
**General competencies to be achieved after training bachelor program in direction „Ecology, environmental protection and sustainable nature management”**

<b>Key competences</b>
<i>Native and foreign language proficiency; Mathematical skills:</i> ability to develop and apply mathematical aptitude, mathematical knowledge and skills; <i>Computer literacy:</i> computer skills; <i>Learning capability:</i> ability to acquire knowledge and
skills and apply them to gain qualification; <i>Social:</i> ability to understand, trust, empathize, tolerate, to express oneself in personal and professional life; <i>Civic:</i> ability to optimally collaborate in public activities; <i>Interpersonal:</i> ability to make critical judgements of oneself and others, teamwork, interpersonal skills, ability to cooperate with experts in different fields, cross-cultural skills, ability to work in an international environment, commitment to ethical values

<b>Basic competences</b>
<p><i>Cognitive</i>: ability to adequately and deeply cognise nature, social environment, and oneself, ability to acquire knowledge and skills independently, personal development; <i>Ecological</i>: knowledge of environment, environmental skills, ability to live in harmony with nature; <i>Safeguarding</i>: knowledge and skills to safeguard living and working conditions, to protect an individual, legal norms of employment, recreation, education, health care, environment, health and life, guarantee of law and order, defence, social rights, crisis management; <i>Creative</i>: ability to adopt innovative approaches at work; <i>Working efficiency</i>: ability to work and fulfil certain job assignments</p>
<b>Specialized competencies</b>
<p><i>Scientific</i>: knowledge of basic disciplines, including natural sciences cycle: higher mathematics, physics, computer science and systemology, general ecology, chemistry and fundamentals of biogeochemistry, geology and fundamentals of geomorphology, hydrology, soil science, meteorology and climatology; <i>Practical</i>: knowledge of principles and objectives of environmental education, ranking of an environmental specialist in the state administrative and economic system; <i>Instrumental</i>: ability to operate advanced instruments to assess components of environment, skills of sampling and field researches, software skills; <i>Specialized and professional</i>: ability to design natural environmental processes and phenomena, causes of environmental threats and ways to eliminate them, application of ecological and legal norms</p>
<b>Professional competences</b>
<p><b>Theoretical:</b> <i>Noospherological</i>: knowledge of the system „man-nature“, ability to understand the human inner world, to perceive man and nature as equal components of the ecosystem, ability to live in harmony with nature; <i>Bioecological</i>: knowledge of living matter, its functions and amount, biosphere and its limits, energy flow in food chain, circulation in biosphere; <i>Geoecological</i>: knowledge of specific relationship between organisms and their habitants in different geographical areas, in terrestrial and aquatic ecosystems; <i>Political</i>: planning and policy-making skills, deep knowledge and practical skills in political management, strategic and tactical coordination in political governance; <i>Economic and legal</i>: knowledge of methods of economic analysis of environmental components, principles of economic decision-making on environmental protection at the national, global and local levels; land, water and mineral resources management, ability to deal with legal environmental</p>
<p>phenomena and situations, to establish the legal cause and effect relationship</p>
<p><b>Practical:</b> <i>Socio ecological</i>: ability to experience and positively accept realities of life, to adapt to them; ability to study and develop ethical principles and norms of relationship between man and nature; <i>Industrial and urban ecological</i>: knowledge of the impact of specific industries (energy, transport, manufacture, military service, urban utility services communication) on environment, and ways to make them eco-friendly; processes on urban residential territories which form environmental conditions and peculiarities of functioning of urban ecosystems <i>Toxicological</i>: knowledge of the impact of hazardous substances on human, animals, insects, plants; poisonous elements and their effect on nature, pathological changes in tissues, organs, organism, environment; <i>Research</i>: ability to identify mechanisms of establishing complex relationship between components of the environment; modelling scenarios of various natural and anthropogenic processes; to make forecasts and provide recommendations for sustainable environmental development of society and the biosphere; <i>Normative</i>: ability to plan, research, monitor, forecast, assess environmental impact and provide information; <i>Agroecological</i>: ability to enhance land reclamation measures in agriculture, to apply different weed and pest killers and balanced fertilizer rate in agrarian landscapes</p>

**Table 2**

**General competencies to be achieved after training master program in direction „Ecology and environmental protection”**

<b>Social and personal competencies</b>
ability to collective and creative activity; ability to systemic creative thinking; ability to self-development and self-perfection life long self-improvement; creativity, leadership, adaptability, tolerance, mobility; ability to interpersonal and intercultural communication; ability to be responsible for the results of resolves
<b>Specialized competencies</b>
ability to develop the criteria for ecological forecasting, designing of environmental status and to determine the methodology of environmental assessment of the biospheres components; ability to progressive and environmental and socio-economic sustainable development; ability to work in computer networks: collection, analysis and information management, skills of using software; ability to identify, analyze and problem-solving of ecological safety and nature management
<b>Professional competences</b>
<b>Research:</b> ability to problem-solving of innovation nature; to have skills of experimental studies; skills of acquisition, preservation, processing, distribution and professional scientific and science technology information; ability to exercise control and search analysis, scientific grounds of ecological studies
<b>Production:</b> conduction of ecological monitoring of objects of agriculture, ecological and improvement monitoring of irrigated and drained lands; implementation of environmental certification of surface, anthropogenic altered and radioactive contaminated objects; implementation of ecological assessment of agrosphere’s areas and technology of crop cultivation, landscape and ecological assessment, assessment of designed documents; implementation of ecological standardization and certification of territories, goods and services
<b>Teaching:</b> availability of knowledge about the nature, features and lows of educational process and its components: training, education, moral and mental and psychological training, development, self-discipline and self-education in accordance with the Bologna Process; ability to develop the methodological systems and some methods of socialization and training of future specialists, their education and development; ability to develop and specification of the training principles and principles of education of students, their professional, moral, mental and psychological training in response to changes taking place in society; ability to forecast of development of the educational process depending on the perspectives of science and society's needs; ability to develop new approaches, principles, forms and methods of professional, moral, mental and psychological training of students and different social groups to work in a competitive environment; ability to identify the regularities of teacher impact on students for the purpose of forming in them a scientific world-view, national consciousness, dignity and pride, national feelings and patriotism, professional liability
<b>Management:</b> ability to develop the long-term, stream-handling plans and projects of environmental control, environmental protection and restoration of the environment; ability to carry out ecological monitoring and environmental audit; ability to organize nature-conservative measures; ability to control environmental safety and anthropogenic safety; presence of knowledge on the legal guarantee of environmental management

Professional environmental education – a modern system-ecological approach to the educational, scientific and research process, providing professional

environmental training and environmental education of all strata and categories of the population on key issues of sustainable development, formation of professional environmental outlook, based on the principles of sustainability, reorientation training on transfer of scientific ecological knowledge to establish and maintain dialogue on the basis of modern reasoning, professional orientation which is aimed at the violation and the practical solution of environmental problems and optimization of environmental situations by predicting, prevention and elimination of environmental risks, modeling and predicting the state and development of natural and anthropogenic ally altered ecosystems, to ensure environmental safety professional environment specialist, professional staff, industries by type of nature, society and the environment as a whole, now and in the future.

The analysis of philosophical, psychological, educational, methodical and special ecological literature on the current state of treatment of professional competence; the concept of professional environmental education, developed professional competence for bachelors and masters ecology in Ukraine.

### **Literature**

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### **Abstract**

In the article the developed professional competence of bachelors and masters ecology in Ukraine, the concept of professional environmental education.

**Key words:** professional competence, professional environmental education.

### **Аннотація**

В статті розробані професійні компетенції бакалаврів і магістрів екології в Україні, концепція професійного екологічного освіти.

**Ключові слова:** профессиональная компетентность, профессиональное экологическое образование.

### **Kompetencje zawodowe absolwentów studiów licencjackich i magisterskich z ekologii**

#### **Streszczenie**

W artykule pokazano rozwój kompetencji zawodowych absolwentów studiów licencjackich i magisterskich z zakresu ekologii na Ukrainie, przedstawiono koncepcję zawodowej edukacji ekologicznej.

**Słowa kluczowe:** kwalifikacje zawodowe, zawodowa edukacja ekologiczna.