

**NATIONAL UNIVERSITY OF LIFE  
AND ENVIRONMENTAL SCIENCE OF  
UKRAINE**

**MASTER DEGREE PROGRAMS**

**2013-2014**

**KYIV-2013**

MASTER DEGREE PROGRAMS

Considered and approved by Scientific Council of NULES of Ukraine  
from 24.04.2013 (protocol № 9)

Edited by  
Full member of the National Academy of Science of Ukraine  
and the Ukrainian Academy of Agrarian Sciences, Dmytro O. Melnychuk

Authors: Natalia M. Ridei, Larysa V. Klikh, Oksana V. Zazymko, Svitlana P. Palamarchyk

The authors would like to thank the deans and the deputy deans of the faculties of the basic institution of NULES of Ukraine (Kyiv) and SS of NULESU "Crimean Agro-technological University" for their feedback during the development of the material: S. Dodonov, I. Antipov, O. Bala, L. Bal-Prylypko, O. Hlazunova, O. Sykalo, O. Dorosh, T. Kaminska, S. Kovalevskyi, Y. Kolomiets, V. Kondratiuk, O. Marus, I. Ohrimenko, M. Prus, I. Radko, Y. Rybalko, I. Rogovskyi, M. Seba, R. Tarasenko, O. Yara, Y. Gerber, M. Melnikov, N. Kraynyuk, V. Safonova, V. Skripnik, T. Shatetc, E. Nazarova, O. Bachinsky, D. Kasatkin, O. Litvinenko

Translated by N. Kharchuk, N. Yamnych, L. Dankevych

Design, typeset and printing by  
Publishing Center of NULES of Ukraine  
03041, Kyiv, 15 Heroyiv Oborony st.

---

**Contents**

Introduction	<b>5</b>
Education and Research Institute of Plant Science, Environment and Biotechnologies	<b>16</b>
Specialty 8.09010101 – “Agronomy”	<b>19</b>
Specialty 8.09010102 – “Agrochemistry and Soil Science”	<b>41</b>
Specialty 8.09010104 – “Fruit and Vegetable Science and Viticulture”	<b>51</b>
Specialty 8.09010105 – “Selection and Genetics of Agricultural Crops”	<b>65</b>
Specialty 8.09010501 – “Plant Protection”	<b>75</b>
Specialty 8.04010601 – “Ecology and Environment Protection”	<b>85</b>
Specialty 8.05140105 – “Environmental Biotechnology and Bioenergetics”	<b>101</b>
Education and Research Institute of Livestock Science and Water Bioresources	<b>111</b>
Specialty 8.09010201 – “Technologies of Production and Processing of Livestock Products”	<b>113</b>
Specialty 8.09020101 – “Water Bioresources”	<b>128</b>
Education and Research Institute of Veterinary Medicine, Quality and Safety of Livestock Products	<b>138</b>
Specialty 8.11010101 – “Veterinary Medicine”	<b>140</b>
Ukrainian Education and Research Institute of Bioresources, Quality and Life Safety	<b>162</b>
Specialty 8.05170104 – “Technologies of Preservation, Conservation and Processing of Meat”	<b>163</b>
Specialty 8.05170105 – “Technologies of Preservation and Processing of Water Bioresources”	<b>169</b>
Specialty 8.18010010 – “Quality, Standardization and Certification”	<b>176</b>
Technical Education and Research Institute	<b>185</b>
Specialty 8.05050303 – “Forest Complex Equipment”	<b>187</b>
Specialty 8.05050312 – “Machinery and Agricultural Equipment”	<b>194</b>
Specialty 8.07010102 – “Organization of transportation and Management in Transport”	<b>202</b>
Specialty 8.07010104 – “Traffic Organization and Control”	<b>206</b>
Specialty 8.10010203 – “Mechanization of Agriculture”	<b>210</b>
Education and Research Institute of Energetics and Automatization	<b>223</b>
Specialty 8.05020201 – “Automated Control of Technological Processes”	<b>225</b>
Specialty 8.05070103 – “Electrotechnical Systems of Power Consumption”	<b>234</b>
Specialty 8.10010101 – “Energetics of Agricultural Production”	<b>240</b>
Specialty 8.10010103 – “Electrification and Automation of Agriculture”	<b>254</b>
Education and Research Institute of Forestry and Park - Gardening Management	<b>264</b>
Specialty 8.05180101 – “Wood processing Technologies”	<b>266</b>
Specialty 8.09010301 – “Forestry”	<b>274</b>
Specialty 8.09010302 – “Wildlife Service”	<b>295</b>
Specialty 8.09010303 – “Park and Gardening Management”	<b>300</b>
Education and Research Institute of Land Resources and Jurisprudence	<b>313</b>
Specialty 8.03040101 – “Law Science”	<b>314</b>
Specialty 8.08010103 – “Land Management and Cadastre”	<b>322</b>
Education and Research Institute of Business	<b>333</b>
Specialty 8.03050401 – “Economics of Enterprise”	<b>335</b>

**MASTER DEGREE PROGRAMS**

Specialty 8.03050801 – “Finance and Credit”	<b>346</b>
Specialty 8.03050803 – “Taxation”	<b>355</b>
Specialty 8.03050901 – “Accounting and Auditing”	<b>360</b>
Specialty 8.03050701 – “Marketing”	<b>368</b>
Specialty 8.03060101 – “Management of Organization and Administration”	<b>376</b>
Specialty 8.03060104 – “Management of Foreign Economic Activities”	<b>385</b>
Specialty 8.18010018 – “Administrative Management”	<b>393</b>
Ukrainian Education and Research Institute of Information and Telecommunication Support of Agroindustrial and Environment Protection Branches of Economy	<b>401</b>
Specialty 8.03050201 – “Economic Cybernetics”	<b>402</b>
Specialty 8.05010101 – “Information Managing Systems and Technologies”	<b>408</b>
Education and Research Institute of Natural Sciences and the Humanities	<b>415</b>
Specialty 8.01010601 – “Social Pedagogy”	<b>416</b>
Specialty 8.18010020 – “Management of Educational Institution”	<b>422</b>
Specialty 8.18010021 – “Pedagogy of Higher School”	<b>429</b>
Education and Research Institute of Postdiploma Education	<b>447</b>
Specialty 8.15010002 – “Public Administration”	<b>448</b>
“Crimean Agro-technological University” Southern Filial of NULES of Ukraine	<b>463</b>
Specialty 8.10010203 – “Mechanization of Agriculture”	<b>466</b>
Specialty 8.05170102 – “Technologies of Fats and Fat Substitutes”	<b>478</b>
Specialty 8.05170106 – “Technologies of Products of Fermentation and Viticulture”	<b>486</b>
Specialty 8.09010101 – “Agronomy”	<b>493</b>
Specialty 8.09010104 – “Fruit and Vegetable Science and Viticulture”	<b>503</b>
Specialty 8.08010103 – “Land Management and Cadastre”	<b>514</b>
Specialty 8.03050401 – “Economics of Enterprise”	<b>521</b>
Specialty 8.03050901 – “Accounting and Auditing”	<b>529</b>
Specialty 8.03060101 – “Management of Organization and Administration”	<b>539</b>
Specialty 8.11010101 – “Veterinary Medicine”	<b>548</b>
International Cooperation of NULES of Ukraine	<b>556</b>

**INTRODUCTION**

The National University of Life and Environmental Sciences of Ukraine has been training masters since 1996.

The curricula and programs of Master’s Degree training are compiled in accordance with requirements of Law of Ukraine “About higher education”. Their adaptation and conformity meet the requirements of U.S. and European systems of higher agricultural education. It is demonstrated by memoranda of mutual recognition with such universities:

– **memorandum of Understanding were signed with** Louisiana State University (USA) 1998, 2009, Iowa State University (USA) 1996, 1998, 2011, Humboldt University of Berlin (Germany) 2002, Ghent University (Belgium) 2002;

– **memorandum of Double-degree diploma** were signed with: Wageningen University (The Netherland), 2006 – “Environmental Sciences”, “Biotechnology”, “Management Economics and Consumer Studies”, Humboldt University of Berlin (Germany), 2002 – “Process and Quality Management”, Anhalt University of Applied Sciences (Germany), 2006 – Master of Food and Agribusiness (MFA), University of Applied Sciences Weihenstephan –Trisdorf (Germany), 2005 – Masters of Business Administration in Agriculture (MBA), Russian State Agrarian University – Moscow Timiryazev Agricultural Academy, 2012 – Master program, Warsaw University of Life Sciences (Poland), 2012 – Master program

**The list of specialties licensed at NULES of Ukraine.**

The NULESU (Kyiv Basic Institution of NULESU and Southern Filial "Crimean Agro-Technological University" (Simferopol) trains masters in 44 specialties (Table 1).

Table 1. The list of specialties of Master training programs at NULESU

Code and title of the branch of knowledge and code and title of specialty	Location of Specialists Training	
	Basic Institution	SF of NULES of Ukraine "CATU"
<b>0101 – Pedagogic Education</b>		
8.01010601 – Social Pedagogy	+ (f, e)	–
<b>0304 – Law</b>		
8.03040101 – Law Science	+ (f)	–
<b>0305 – Economics and Entrepreneurship</b>		
8.03050201 – Economic Cybernetics	+ (f, c, e)	–
8.03050401 – Economics of Enterprise	+ (f, c, e)	–
8.03050701 – Marketing	+ (f, c, e)	+ (f, c, e)
8.03050801 – Finance and Credit	+ (f, c, e)	+
8.03050803 – Taxation	+ (f, c, e)	+ (f, c, e)
8.03050901 – Accounting and Auditing	+ (f, c, e)	–
<b>0306 – Management and Administration</b>		
8.03060101 – Management of Organizations and Administration	+ (f, c, e)	+ (f, c, e)
8.03060104 – Management of Foreign Economic Activities	+ (f, c, e)	–
<b>0401 – Natural Sciences</b>		
8.04010601 – Ecology and Environment Protection	+ (f, c, e)	–
<b>0501 –Computer Science and Engineering</b>		
8.05010101 – Information Managing Systems and Technologies	+ (f)	–

MASTER DEGREE PROGRAMS

Code and title of the branch of knowledge and code and title of specialty	Location of Specialists Training	
	Basic Institution	SF of NULES of Ukraine "CATU"
<b>0502 – Automation and Control</b>		
8.05020201 – Automated Control of Technological Processes	+ (f, c, e)	–
<b>0505 – Mechanical Engineering and Material Processing</b>		
8.05050303 – Forest Complex Equipment	+ (f, c, e)	–
8.05050312 – Machinery and Agricultural Equipment	+ (f, c, e)	–
<b>0507 – Electrical Engineering and Electromechanics</b>		
8.05070103 – Electrotechnical Systems of Power Consumption	+ (f, c, e)	–
<b>0514 – Biotechnology</b>		
8.05140105 – Environmental Biotechnology and Bioenergetics	+ (f, c, e)	–
<b>0517– Food Production and Processing of Agricultural Production</b>		
8.05170102 – Technologies of Fats and Fat Substitutes	–	+ (f)
8.05170104 – Technologies of Preservation, Conservation and Processing of Meat	+ (f, c, e)	
8.05170105 – Technologies of Preservation and Processing of Water Bioresources	+ (f, c, e)	
8.05170106 – Technologies of Products of Fermentation and Viniculture	–	+ (f)
<b>0518 – Wood Processing</b>		
8.05180101 – Wood Processing Technologies	+ (f, c, e)	–
<b>0701 – Transport and Transport Infrastructure</b>		
8.07010102 – Organization of Transportation and Management in Transport	+ (f)	–
8.07010104 – Traffic Organization and Control	+ (f)	–
<b>0801 – Geodesy and Land management</b>		
8.08010103 – Land management and Cadastre	+ (f, c, e)	+ (f, c, e)
<b>1304 – Agriculture and Forestry</b>		
8.09010101 – Agronomy	+ (f, c, e)	+ (f, c, e)
8.09010102 – Agrochemistry and Soil Science	+ (f, c, e)	–
8.09010104 – Fruit and Vegetable Science and Viticulture	+ (f, c, e)	+ (f, c, e)
8.09010105 – Selection and Genetics of Agricultural Crops	+ (f, c, e)	–
8.09010201 – Technologies of Production and Processing of Livestock Products	+ (f, c, e)	–
8.09010301 – Forestry	+ (f, c, e)	–
8.09010302 – Wildlife Service	+ (f)	-
8.09010303 – Park and Gardening Management	+ (f, c, e)	–
8.09010501 – Plant Protection	+ (f, c, e)	–
<b>0902 – Fishery and Aquaculture</b>		
8.09020101 – Water Bioresources	+ (f, c, e)	–
<b>1001 – Engineering and Energetics of Agricultural Production</b>		
8.10010101 – Energetics of Agricultural Production	+ (f, c, e)	–
8.10010103 – Electrification and Automation of Agriculture	+ (f, c, e)	–

MASTER DEGREE PROGRAMS

Code and title of the branch of knowledge and code and title of specialty	Location of Specialists Training	
	Basic Institution	SF of NULES of Ukraine "CATU"
8.10010203 – Mechanization of Agriculture	+ (f, c, e)	+ (f, c, e)
<b>1101 – Veterinary Sciences</b>		
8.11010101 – Veterinary Medicine	+ (f, c*)	+ (f, c, e)
<b>1501 – Public Service</b>		
8.15010005 – Public Administration	+ (f*, c*, e*)	–
<b>1801 – Specific Categories</b>		
8.18010010 – Quality, Standardization and Certification	+ (f, c, e)	–
8.18010018 – Administrative Management	+ (f, c, e)	–
8.18010020 – Management of Educational Institution	+ (f)	–
8.18010021 – Pedagogy of Higher School	+ (f, c, e)	–
Note: + - available: – - not available; F - Full-time; P – Extra-mural; E - External; * - training on the basis of full higher education		

The spheres of employment of the graduates. The peculiarities of Specialists' training according to Master programs at NULESU are characterized by close relationship of the program contents with the sphere of future employment of the graduates (fig. 1): production, research, teaching, expert-control and management.

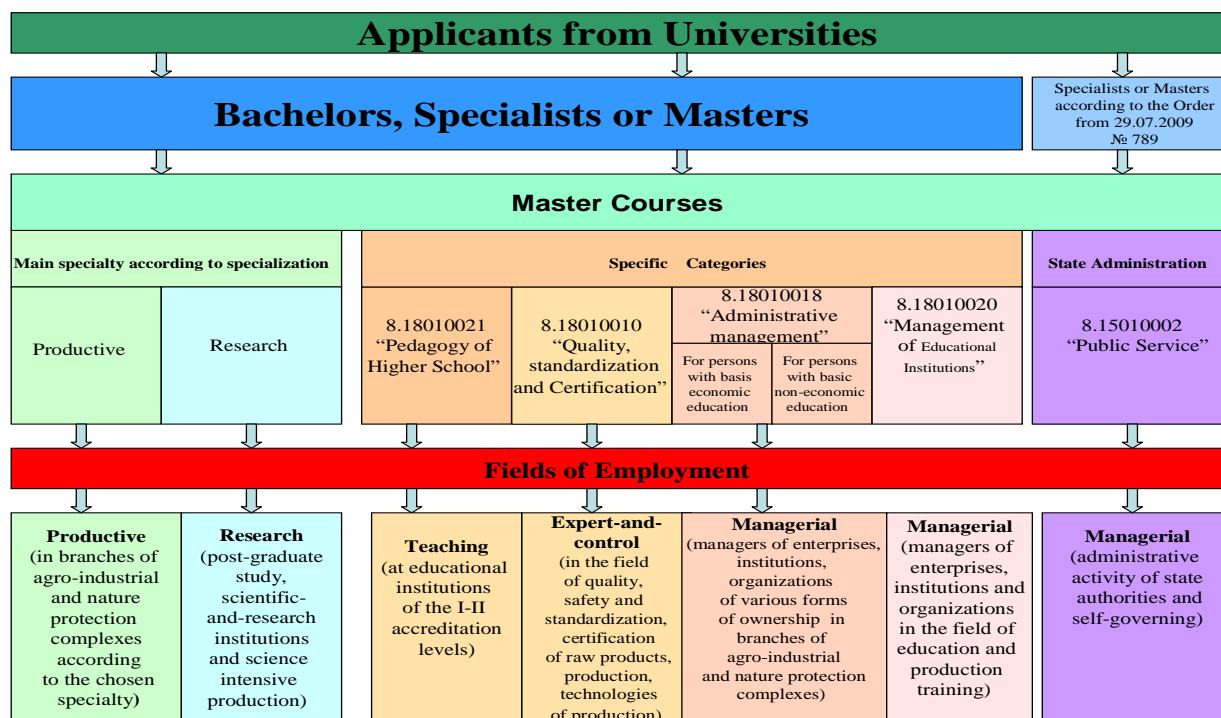


Fig. 1. Spheres of employment of Master graduates

The graduates who intend to continue studying within the frames of the chosen direction of training for in-depth specialization in the chosen specialty have the right to apply for **production-oriented programs** according to the results of entrance examination. These programs aim to provide production science-intensive sphere with highly-qualified specialists able to implement innovative knowledge into effective up-to-date technologies.

MASTER DEGREE PROGRAMS

Master of **Research-oriented programs** are trained only at departments of the University, which are entitled to train postgraduate students, have sufficient funding and considerable progress in research activities. Applicants to such Master Degree Programs should know at least one foreign language. Their training includes conducting research activity according to the chosen specialty during postgraduate study or at education and research institutions and science-intensive industries.

The programs in the field of knowledge “Specific Categories” in specialties “Pedagogy of Higher School”, “Quality, Standardization and Certification”, “Administrative Management”, “Management of Educational Institution” have a great appeal to students. Bachelors (specialists/Masters) of any field of training who have a good command of foreign languages (English, German, French, Japanese, etc) have an additional advantage for admission.

**Master Programs in specialty “Pedagogy of Higher School”** train teaching personnel for agrarian higher educational institutions of I-II accreditation level.

**Master Programs in specialty “Quality, Standardization and Certification”** train specialists who are able to adapt Ukrainian system of assessment of quality, safety, certification and standardization of AIC products according to international standards and their practical implementation;

The programs include specializations that provide training of:

- experts-analysts who have knowledge of modern methods of chemical, physical-chemical, biological, ecological expertise, quality and safety assessment of corresponding objects in accordance with international standards (specialty – "Laboratory Activity"); (Table 2,3);
- experts in management of quality, certification and standardization of raw materials, final products, technology, organizations, etc. at related institutions and industries.

**Table 2.** Master programs of applied biology in specialization –“Laboratory Activity” of expert and control sphere of employment (ITRC of Biology of Plants and Laboratory Diagnostics of the Quality and Safety of Products of Plant growing and Environment)

Specialty of Master training	Master program “Laboratory work”	Objects of Specializations
Agronomy	<i>The methods of microbiological and virusological control of plants and environment</i>	plant health, quality of plant products, diagnostics of microorganisms and viruses in agricultural products, water, soils, air
Fruit and Vegetable Science and Viniculture		
Agrochemistry and Soil Science		
Plant Protection		
Ecology and Environment Protection		
Environment Biotechnology and Bioenergetics		
Forestry		
Park and Gardening Management		
Agronomy	<i>The methods of entomological control in plants growing and environment</i>	insects, plants, soils
Fruit and Vegetable Science and Viniculture		
Plant Protection		
Ecology and Environmental Protection		
Environmental Biotechnology and Bioenergetics		
Forestry		



MASTER DEGREE PROGRAMS

Specialty of Master training	Master program “Laboratory work”	Objects of Specializations
Park and Gardening Management		
Agronomy	<i>The methods of genetic control of plants growing and environment</i>	genotypes and genomes of plants, genetic modifications and genetic structures
Selection and Genetics of Agricultural Crops		
Fruit and Vegetable Science and Viniculture		
Plant Protection		
Environmental Biotechnology and Bioenergetics		
Ecology and Environment Protection		
Ecology and Environment Protection	<i>Methods of ecological control of environment objects</i>	plants, water, soils, air
Agrochemistry and Soil Science		
Forestry		
Ecology and Environment Protection	<i>Methods of anthropogenic, ecological and radiation safety of plants</i>	plants, water, soils, air
Ecology and Environment Protection	<i>Reserve management and the methods of environment protection control</i>	plants, water, soils, air

**Table 3.** Master degree programs of applied biology in specialty –“Laboratory Activity” of expert and control sphere of employment (ITRC of Biology of Animals and Laboratory Diagnostics of their Health, Quality and Safety of the Livestock Products )

Specialty of Master training	Master program “Laboratory Activity”	Objects of Specializations
Veterinary Medicine	<i>Microbiological methods of diagnostics in livestock and veterinary medicine</i>	agricultural raw material and livestock food products, fodder, water
Production Technology and Processing of Livestock Products		
Water Bioresources		
Technology of Preservation, Conservation and Processing of Meat		
Technology of Preservation and Processing of Water Bioresources		
Veterinary Medicine	<i>Immunological methods of research</i>	Animal health and prevention of diseases
Production Technology and Processing of Livestock Products		
Water Bioresources		
Veterinary Medicine Technology of Production and Processing of Livestock Products Technology of Preservation, Conservation and Processing of Meat Technology of Preservation and Processing of Water Bioresources Water Bioresources	<i>The methods of chemical and toxicological analysis</i>	animal health; toxins in agricultural raw material, food products, fodder, water, soils
Veterinary Medicine	<i>The methods of</i>	agricultural raw

MASTER DEGREE PROGRAMS

Specialty of Master training	Master program “Laboratory Activity”	Objects of Specializations
Production Technology and Processing of Livestock Products	<i>biochemical research</i>	material and livestock food products, fodder, water
Technology of Preservation, Conservation and Processing of Meat		
Technology of Preservation and Processing of Water Bioresources		
Water Bioresources		
Ecology and Environment Protection	<i>Physical methods of diagnostics and treatment</i>	animal health, estimation of radiation safety of agricultural raw material, food products, fodders, water and soils
Veterinary Medicine		
Veterinary Medicine	<i>Veterinary and sanitarian expertise of agricultural and food products</i>	animal health, safety and quality of fodder (premixes, mixed fodder) and food products
Veterinary Medicine	<i>Virology methods in the veterinary medicine</i>	viruses, animal health
Veterinary Medicine	<i>Immunological biotechnology</i>	agricultural raw material and food products, fodder

Programs of **Administrative Management for Master Training (MBA)** are train highly-professional managers who are able to manage agrarian business using innovative managerial knowledge and skills, modern computer technologies and foreign languages. The program contents are influenced by basic education (economic or non-economic) and future employment. The curriculum of economic program includes technological disciplines in the cycle of elective disciplines, for others – economic disciplines.

Master programs in specialty **“Management of Educational Institution”** train managers of enterprises, institutions and organizations in the sphere of education and production training.

Master programs in the field of training **“Public Administration”** in specialty **“Public Service”** train specialists for public service and local self-governing bodies who are able to effectively develop and apply their knowledge and skills in the field of state regulations, current legislation and information technologies.

The university introduced the international programs in collaboration with a number of foreign universities-partners: “Processes and Quality Management” with Humboldt university (Germany), international German program „Master of Business Administration in Agriculture (MBA-agr)”with Weihenschtephan university of applied sciences, “Master of Food and Agribusiness”(MFA) with Anhalt university of applied sciences (Germany), “Environment Protection”, “Bioeconomics” and “Biotechnology” with Wageningen university (the Netherlands), “International Biobusiness” with Tokyo agricultural university (Japan), “Management of International economic activity” with Czech University of Life Sciences (Czech Republic). These programs offer double diplomas – of NULESU and university-partner, which signifies world recognition of our system of master training.

Structure of Master programs of NULES of Ukraine ( Fig. 2)

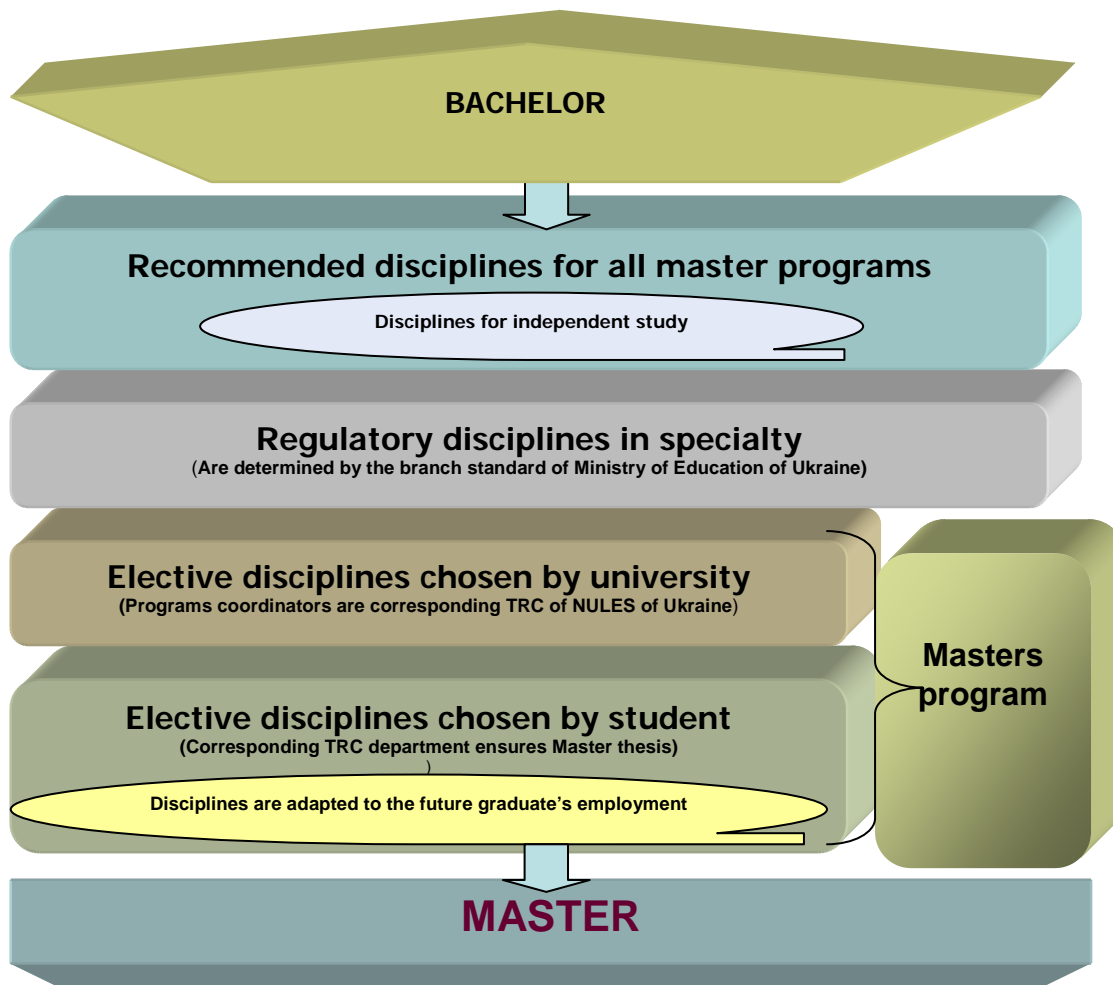


Fig. 2. Structure of Master programs of NULESU

The content of Master programs at NULES of Ukraine is determined by:

- the requirements to the professional activity of specialists;
- the direction and professional specialization of basic education;
- the peculiarities of Master training.

The content structure of Master programs at NULES of Ukraine includes four discipline modules.

Compulsory disciplines for university Master students (Module 1) train Masters for their future research activity and post graduate study, encourage to master foreign language, to develop nature and society in harmony, to be aware of international standardization and certification system of agricultural production branch and forecast the development of world agriculture and food resources .

The list and extent of disciplines compulsory within the proper specialty (Module 2) are determined by the branch standards of higher education of Ukraine. These disciplines form the base of a specialty and Master qualification.

Elective disciplines form the base of specialization within the proper specialty. The list and content of the elective disciplines chosen by NULES of Ukraine (module 3) are formed by the proper training and research centre (TRC) of the university. The disciplines chosen by students (module 4) and topics of Masters' theses are formed by the proper

department of TRC which trains Master students. These disciplines enable students to prepare Master's thesis at the current level and adapt a Master graduate to future job.

Special students training including the research according to the Master's thesis topic starts since the first term of their study at Master Program. Considerable part of training is for self-study.

**The main forms of implementation of educational process in NULESU.** The educational process at NULESU is implemented in various forms, among them being the class work, practical training and control (Fig. 3).

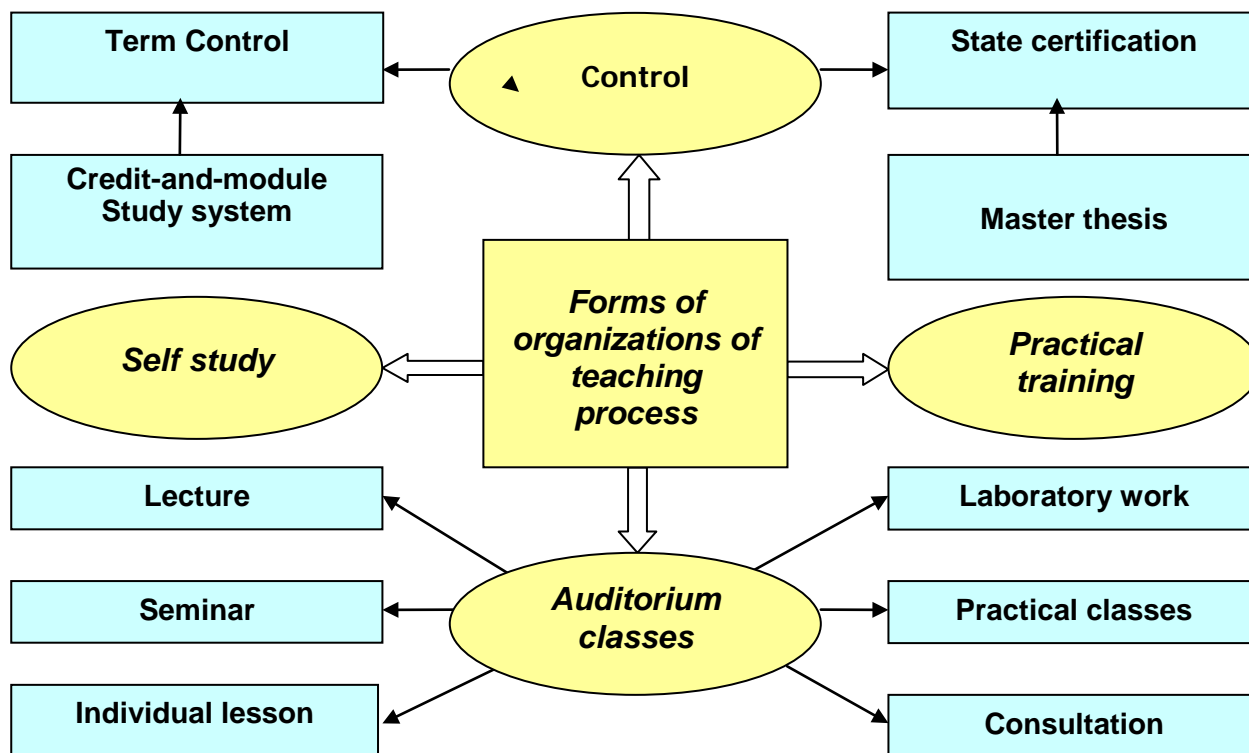


Fig. 3. The main form of implementation of academic process in NULESU

The auditorium classes are conducted in the form of lectures, practical classes, seminar, laboratory and individual lessons, including classes with the use of distance learning methods.

Self-study is the main way to master knowledge and skills in the time free from normative classes. At NULESU it is provided by the system of teaching-and-methodic means, among them manuals, teaching and methodical textbooks, abstracts of lectures, practical classes etc, including their electronic versions which can be used on distance. This work is conducted according to schedules. It guarantees possibility of the students' individual access to the necessary didactic materials. At the beginning of the current term the students are informed about the schedule.

The teaching staff of appropriate departments are always available for consultation when students use complex equipment and information access systems while studying independently.

Integrated corporate network which includes 3000 computers, tens of servers, 14 sites of the proper subdivisions of the university was created at NULES of Ukraine to conduct distance education. Education and information portal functions on the base of Moodle platform (original Ukrainian version), where electronic training courses in all normative disciplines of Master programs are disposed. These factors enable to apply distance study technologies in Master training process that meet the world standards.

**The system of Master practical training.** Special attention is paid to students' practical training system which is conducted in the form of laboratory and practical classes, training, production and pre-diploma practices that are done at university's centers of practical training:

- 3 research stations – "Agronomic Research Station" SD of NULESU and "Boyarka Forestry Research Station" SD of NULESU (Kyiv region) and "Foros" Scientific and Research Station of Mountain Forestry and Gardening (AR of Crimea)
- 7 Training and Research Farms (TRF) – Velykosnitynka Training and Research Farm named after Muzychenko SD of NULESU, "Vorzel" Training and Research Farm SD of NULESU and "Nemishaievo Agro-Technical College" TRF of SSD of NULESU in Kyiv Region, "Training and Research Poultry Breeding Plant named after Frunze" SD of NULESU (Crimea) and "Komunar" TRF (AR of Crimea) SD of NULESU, "Zalischyky Agricultural College named after Khraplyvyi" TRF of the SSD of NULESU and "Nizhyn Agro-Technical Institute" TRF of the SSD of NULESU (Chernihiv Region)
- Special facilities for practical training of NULESU regional higher educational establishments of I-II accreditation levels
- Training and research Center of Biology and Ecology of Subtropical Plants and Landscape Science of NULESU (Yalta, AR of Crimea)
- Botanical garden of NULESU.

Methods of control are exams and credits which are done in the form of tests. The final grade is given according to the current normative acts, national system and European system of ECTS credit transfer for all disciplines and practices included into curriculum.

Once a term Master student gets assessment at the department and TSC meetings, where he or she reports on implementation of individual plan on the whole and preparation of Master's thesis in particular. (Fig. 4)

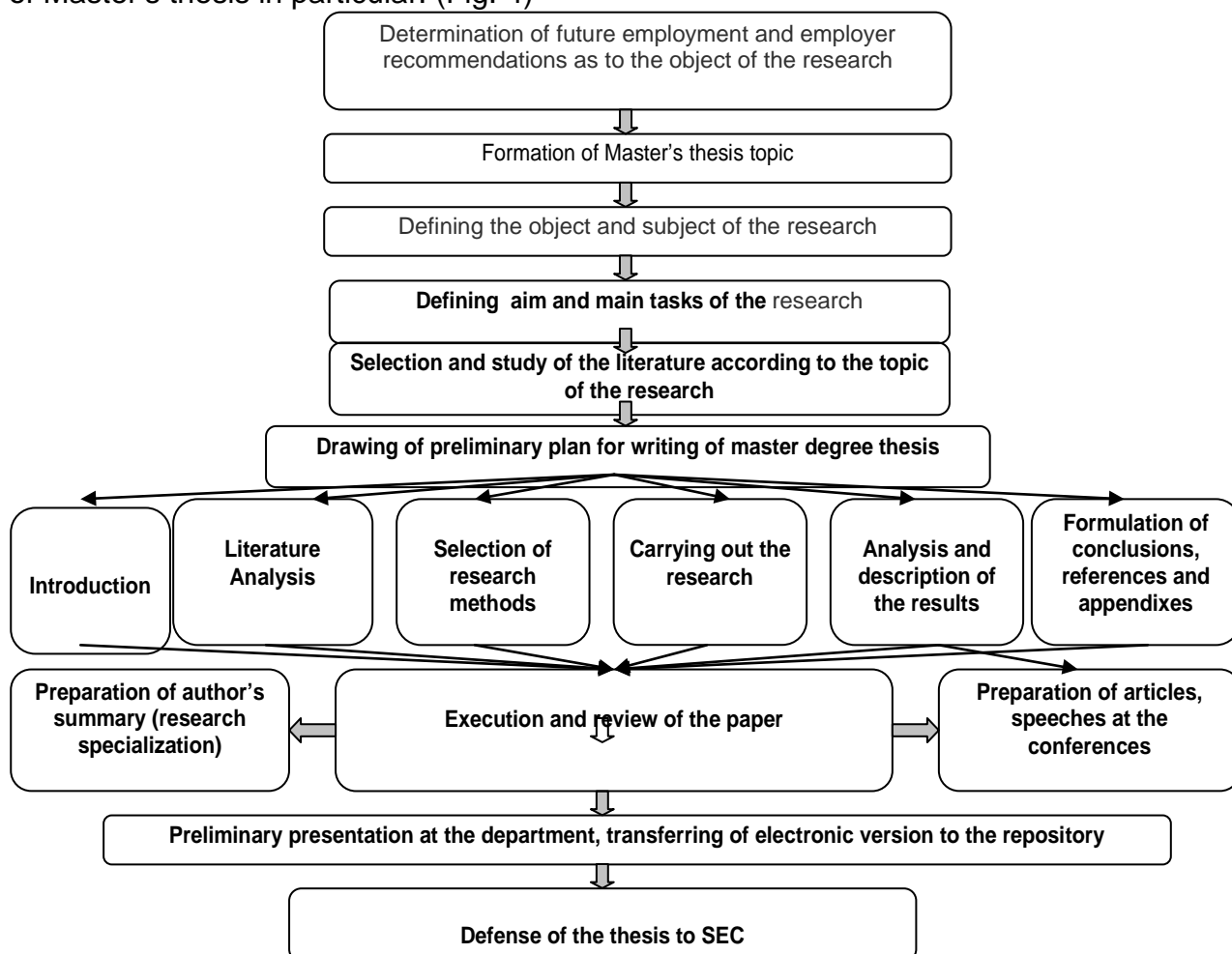


Fig. 4. Stages of writing Master thesis

Defense of Master's thesis is the final stage of student training and the form of graduates state attestation.

#### **EXTRA-MURAL AND EXTERNAL FORMS IN MASTER TRAINING AT NULESU**

The majority of students do full-time Master degree programs at NULES of Ukraine. Besides, there are extra-mural and external forms of study.

Extra-mural form, as a rule, lasts longer in comparison with full-time form, and enables student to obtain the most part of knowledge independently, using respective syllabi and means of distance learning.

For interim attestations Master students of extra-mural form attend university classes to obtain brief systemized knowledge. During this period they defend term papers (projects), take credits and exams. The period of examination session is determined by the duration of the Master program.

External students are involved in exceptionally independent training. They have their attestation credited according to the individual schedule which is drawn by students themselves, Training and Research Center and the Dean's office. The limited number of students who are capable to do master course independently can apply for external form (the number of students is determined by the Ministry of Education and Science of Ukraine).

The List of specialties on extra-mural and external forms of master training at NULES of Ukraine is given in Table 1.

#### **ADMISSION TO MASTER DEGREE AT NULES OF UKRAINE**

Admission to Master training is conducted according to governmental order, and contract with physical persons or entities. Applicants for Master Programs, must have basic or full higher education in respective direction (specialty), according to requirements, approved by the rules of admission to Master Degree Programs at NULES of Ukraine.

To apply for Master programs on the basis of EQL Specialis, applicant should pay tuition fee (except applicants to "Public service" specialty at the basic institution of NULES of Ukraine). To apply for EQL Master in specialty 8.11010101 "Veterinary Medicine" (according to specialization), applicants are required to have EQL "Junior specialist" in specialty 5.11010101 "Veterinary Medicine".

The admission in the specialty "Public Service" is realized at the Basic Institution of NULES of Ukraine according to the special rules confirmed by the regulation of Cabinet of Ministers dated 29.07.2009 № 789 "On the approval of the procedure of admission on educational professional program of Masters training in specialty "Public Service" of the field of knowledge "Public Administration" and graduates employment". Persons that have higher education, work in public authority and self-government bodies, have at least one year work experience in public authority and self-government bodies and are younger than 45 at the moment of documents submission can apply to the program mentioned above.

An applicant applying to Master Program has to submit to the Admission Committee the following documents: application for Rector of the University; original of diploma about obtained education or its approved copy; annex to diploma or its approved copy; 5 photos of size 3x4 sm; direction-recommendation (for research specialization); copy of identification number document, copy of passport (1, 2 pages and the place of registration), passport and other documents giving the right for entrance are shown personally.

The individual's competitive grade is calculated as a sum of grades of the entrance examinations results and the average grade of the appendix to diploma. It is assessed according to the scale from 100 to 200 grades. Entrance examinations for programs of

---

## MASTER DEGREE PROGRAMS

EQL “Master” are conducted in the form of tests in the complex of fundamental and professionally oriented disciplines of the regulatory cycle and foreign language according to the Bachelor program.

For applicants in specialties:

- “Pedagogy of higher school” and “Management of educational institution” –tests in the complex of humanitarian subjects and foreign language;
- “Quality, standardization and certification”– tests in quality, standardization, certification and foreign language;
- “Administrative management” – tests in principles of economic theory and foreign language;
- “Public service” – tests in principles of state and law and principles of economics.

In conclusion it should be mentioned that clearly defined concept of Master training, regular selection of talented young people and their scientific support, highly qualified teaching staff, up-to-date material and technical base enable to train competitive and skilled specialists who combine scientific achievements with innovative activity finding their place in today's rapidly changing labor market.

**Welcome to the National University  
of Life and Environmental Sciences!**

---

**EDUCATION AND RESEARCH INSTITUTE OF PLANT SCIENCE, ENVIRONMENT AND BIOTECHNOLOGIES**

**Director** – Gregory I. Demydas, Doctor of Agricultural Sciences, Professor  
**tel.:** (044) 527-80-77, 527-80-21  
**E-mail:** demydas@nubip.edu.ua  
**Locality:** educational building № 4, room 40

**AGROBIOLOGY FACULTY**

**Dean** – Igor O. Antipov, Candidate of Agriculture Sciences, Associate professor  
**tel.:** (044) 527-82-13  
**E-mail:** atigav@rambler.ru  
**Locality:** educational building № 4, room 39

**Faculty provides training in the following specialties:**

**8.09010101 “Agronomy”**

**Departments in charge of graduate training:**

**Plant Growing**

**Tel.:** (044) 527-86-26

**E-mail:** kalenskaya@nauu.kiev.ua

**Head of department** – Doctor of Agricultural Sciences, Professor, S. M. Kalenska

**Agriculture and Herbology**

**Tel.:** (044) 527-82-14

**E-mail:** agriculture\_chair@twin.nauu.kiev.ua

**Head of department** – Doctor of Agricultural Sciences, Professor, S. P. Tanchyk

**Technologies of Storage, Processing and Standardization of Plant Production  
named after Professor B. V. Lesyk**

**Tel.:** (044) 527-86-66

**E-mail:** save\_tech\_chair@nauu.kiev.ua

**Head of department** – Candidate of Agricultural Sciences, Professor G. I.

Podpriatov

**Forage production and Melioration**

**Tel.:** (044) 527-85-15

**E-mail:** korm60@ukr.net

**Head of department** – Doctor of Agricultural Sciences, Professor G. I. Demydas

**8.09010102 “Agrochemistry and Soil Science”**

**Departments in charge of graduate training:**

**Agricultural Chemistry and Agricultural Production Quality named after  
O.I. Dushechkin**

**Tel.:** (044) 527-88-17

**E-mail:** quality\_chair@mail.ru

**Head of department** – Doctor of Agricultural Sciences, Professor A. V. Bykin

**Soil Science and Soil Protection named after Professor V. I. Shykula**

**Tel.:** (044) 527-81-02

**E-mail:** grunt\_nubip@ukr.net

**Head of department** – Doctor of Agricultural Sciences, Professor A. D. Balaev

---



**8.09010104 “Fruit and Vegetable Science and Viticulture”**

**Departments in charge of graduate training:**

**Vegetable Growing**

**Tel.: (044) 527-81-69**

**E-mail: NNI\_roslyny@nauu.kiev.ua**

**Head of department** – Doctor of Agricultural Sciences, Professor Z. D. Sych

**Gardening named after Professor V. L. Symyrenko**

**Tel.: (044) 527-85-59**

**E-mail: garden\_chair@nauu.kiev.ua**

**Head of department** – Candidate of Agricultural Sciences, Associate professor

B.M. Mazur

**Soil under Cover**

**Tel.: (044) 527-80-67**

**E-mail: hothouse\_chair@twin.nauu.kiev.ua**

**Head of department** – Doctor of Ecological Sciences, Professor O. V. Prylipko

**8.09010105 “Selection and Genetics of Agricultural Crops”**

**Departments in charge of graduate training:**

**Selection and Genetics**

**Tel.: (044) 527-86-26**

**E-mail: Parii@i.ua**

**Head of department** – Candidate of Biological Sciences, Associate professor M. F.

Pariy

**FACULTY OF PLANT PROTECTION**

**Dean** – Candidate of Agricultural Sciences, Associate professor Oksana S. Sykalo

**Tel.: (044) 527-85-77**

**E-mail: dekanat\_FZR@bigmir.net**

**Faculty provides training of masters in following specialties:**

**8.09010501 “Plant Protection”**

**Departments in charge of graduate training:**

**Department of Entomology named after Prof. M.P. Dyadechko**

**Tel.: (044) 527-89-78**

**E-mail: entomologia@yandex.ua**

**Head of the department** – Vitaliy P. Fedorenko, Doctor of biological sciences, Academician of NAAN of Ukraine

**Department of Phytopathology named after Academician V.F. Peresyupkin**

**Tel.: (044) 527-82-11**

**E-mail: phytopath\_Peresupkin@ukr.net**

**Head of the department** – Alexei F. Antonenko, Doctor of Agricultural Sciences, Professor

**Department of Integrated Pest Management and Plant Quarantine**

**Tel.: 527-82-12**

**E-mail: kaf.izkr@yandex.ru**

---

**Head of the department** – Vladimir M. Zherebko, Doctor of Agricultural Sciences, Professor

## **ECOLOGY AND SUSTAINABLE DEVELOPMENT DEPARTMENT**

**Dean** – Candidate of pedagogic sciences Rybalko Iuliia Volodymyrivna (scientific degree, academic rank, full name)

**Tel.:** (044) 527-80-89

**E-mail:** eco\_dep@mail.ru

**Location:** academic building № 17, off. 221

**The Department provides the training of Masters majoring in:**

**8.04010601 “Ecology and Environment Protection”**

**Chairs:**

**Agrarian sphere ecology and ecological control chair**

**Tel.:** (044) 527-81-95

**E-mail:** eco\_dep@mail.ru

**Head of Chair** – Chaika V. M., Doctor of Agriculture Science, Professor

**General ecology and emergency management chair**

**Tel. :** (044) 527-87-65

**E-mail:** general\_ecology@ukr.net

**Head of Chair** – Gaichenko V. A., Doctor of Biological Sciences, Professor

**Botanic Chair**

**Tel. :** (044) 527-82-08

**E-mail:** eco\_dep@mail.ru

**Head of Chair** – Iakubenko B. Ie., Doctor of Biological Sciences, Professor

**Landscape ecology and reserve managements and studies chair**

**Tel.:** (044) 406-08-13

**E-mail:** bkeipr@mail.ru

**Head of Chair** – Kropyvko S. V., PhD in Technical Sciences, Assistant Professor

## **FACULTY OF BIOTECHNOLOGIES**

**Dean** – Candidate of Biological Sciences, associate professor Kolomiets Julia Vasylivna

**Tel.:** (044) 527-89-67

**E-mail:** Kolomiets@nubip.edu.ua

**Location:** academic building № 4, room 41a

**The Department provides the training of Masters majoring in:**

**8.05140105 «Environmental Biotechnology and Bioenergetics»**

**Departments in charge of graduate training:**

**Ecobiotechnologies and Biodiversity**

**Тел.:** (044) 527-85-17

**E-mail:** maksym@nubip.edu.ua

**Head of Chair** – Doctor of Biological Sciences, Professor, Full member of the Ukrainian Academy of Agrarian Sciences Melnychuk Maxym Dmytrovich

---

**Masters  
in specialty “AGRONOMY”  
branch of knowledge “Agriculture and forestry”**

**Form of training, licensed number of students:**

– full-time 90

– correspondence 50

**Term of study** 1,5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian, English, German

**Qualification of graduates** agronomist-researcher

**The concept of training**

The base of masters educational programs forming in specialty is according exist and perspective of branch and plants growing, supplying variation in system masers educational program for fast adaptation to actually national and international labor needs, integration educational, scientific-researches and innovation activities as example as leadings worlds universities.

Masters' educational program in specialty focus on effective personnel students' educational, which can use adaptive technology agriculture plants growing and supply it's economical, agrarian, energetic and ecology effectiveness. After graduation from university, master can create and realize some actions for improving effectiveness of biological sorts' potential using; forming of harvests productivity and quality depends from soil and climate conditions and elements of plants growing technologies, decision modern industrial and scientific targets in growing technologies. Decision of modern industrial and scientific problems linked with growing technologies, harvest processing and storage plants production.

**Production oriented master program**

***Master program “Organic agriculture”***

The aim of the program is to provide students with the knowledge and skills of a qualified analysis of farming systems in terms of their compliance with organic and ecological agriculture.

The object of the study serves purposes of agriculture or some of their units or technology. Subjects of study are defined technological regulations of organic links and ecological agriculture: environmentally sound crop rotation, environmental regulations fertilize the soil, mechanical tillage systems, pest control, and irrigation activities.

**Sphere of graduates employment**

Agricultural enterprises of different ownership, regional and district administration, advanced farms, companies, holdings and corporations, scientific-research establishments of NAAS of Ukraine.

***Master program “Applied herbology”***

The training involves mastering the future specialist agronomy profile necessary combination of theoretical and practical nobility of the industry by examining five special subjects during classes, training and practice. The final step is the preparation of master thesis, which is the ability to realize future specialist totality of knowledge acquired during the training.

---

### **Sphere of graduates employment**

Agricultural enterprises of different ownership, regional and district administration, advanced farms, companies, holdings and corporations, scientific-research establishments of NAAS of Ukraine.

#### ***Master program “Production and marketing of cereal crops”***

Production of cereal crops provides studying of field crops forms diversity, peculiarities in its biology and physiology, extension of cereal crops species set that are suitable for cultivation in certain soil-climatic zones, technologies of cereal crops cultivation, standards on obtained products quality, regularities of yield quality and quantity formation, development and improvement of technological elements to obtain high, sustain, economically valuable and environmentally friendly yields with high quality in zonal and varietal aspects, economy, marketing and management of grain production.

### **Sphere of graduates employment**

Agricultural enterprises of different ownership, regional and district administration, advanced farms, companies, holdings and corporations, scientific-research establishments of NAAS of Ukraine.

#### ***Master program “Production and marketing of industrial crops”***

Production of industrial crops, in particular, cultivation technologies, studying of systematic, morphological, anatomy and biological peculiarities of industrial crops, requirements to conditions of cultivation and quality of products according to the domestic and international standards, economy, marketing and management of branch, trade and market conjuncture.

Describe essence of innovative, adopted to certain soil-climatic conditions, economy valuable and environmentally friendly technologies of cultivation of each industrial crop, placement in crop rotation, fertilization, soil tillage systems, seed preparation and seeding, control of weeds, diseases and pests, harvesting and postharvest processing.

### **Sphere of graduates employment**

Agricultural enterprises of different ownership, regional and district administration, advanced farms, companies, holdings and corporations, scientific-research establishments of NAAS of Ukraine.

#### ***Master program “Transportation, storage and processing of crop production”***

Master program generates in-depth knowledge of the latest technologies of transportation, post harvest handling (ventilation, cleaning, drying, etc.). Cereals masses on the basis of knowledge of basic features of cereals (flour, cereals), legumes and oilseeds. Based on the knowledge of physical and physiological properties of the main vegetables, fruit crops, potato is logistics harvest each juicy product. Requirements for industrial raw materials (lonotresty, sugar beet roots, hops raw material) provided the choice of optimum cleaning and initial portfolio – which creates this master's program.

### **Sphere of graduates employment**

Growing organization collecting, handling, product evaluation, storage and processing of plant products grown.

---

***Master program “Manufacture and marketing of fodder crop production”***

The program provides for growing of fodder crops as a source of nutrient green fodder for livestock feeding and raw material for procurement of conserved fodder according to the market.

**Sphere of graduates employment**

Agricultural enterprises of different ownership, regional and district administration, advanced farms, companies, holdings and corporations, scientific-research establishments of NAAS of Ukraine.

**Research oriented master program**

***Master program “The theory and practice of farmland weed controlling”***

The program, prepared and adapted at the National University of Life and Environmental Sciences of Ukraine, is aimed at training this level on this issue. It is Ukraine's first master's program at this level. It involves training of the most talented bachelors in scientific work in the direction of herbology. Mastering the Master's program will perform future research work on problems of herbology at the present level of development of the science in the world.

**Sphere of graduates employment**

Admission to PhD program of NULES of Ukraine and other higher educational establishments, employment in advanced agricultural industrial enterprises, scientific-research establishments of NAAS of Ukraine.

***Master program “Theoretical foundation and development of energy-efficient ecological agriculture in Ukraine”***

The aim of the program is to provide students with the knowledge and skills justifying energy saving, economical agriculture by combining the natural capacity of the soil and farming practices to achieve resource efficiency secured arable land, expanded reproduction of fertility, ecological safety and environmental growing products.

The object of the study is the entire farming system, some of the managers and technology. Subjects of the study sites are technological features of their parts, parts of the farming system, some technology events.

**Sphere of graduates employment**

Admission to PhD program of NULES of Ukraine and other higher educational establishments, employment in advanced agricultural industrial enterprises, scientific-research establishments of NAAS of Ukraine.

***Master program “Agricultural crops productivity formation management”***

Scientifically-grounded management of agricultural crops productivity formation considering its adaptation abilities and resistance to biotic and abiotic factors, stresses and usage of agrotechnical measures aiming on realization of genetically determined biological potential and obtaining of high, sustain yields of agricultural crops with high quality.

**Sphere of graduates employment**

Admission to PhD program of NULES of Ukraine and other higher educational establishments, employment in advanced agricultural industrial enterprises, scientific-research establishments of NAAS of Ukraine.

---

***Master program “The quality of crop production depending on postharvest handling storage and processing factors”***

Master's program generates in future professionals the need to ensure maximum crop (crop, vegetable, horticulture) factors for growth and development (agrotechnical agrochemical and others.) For the harvest of a certain quality it provides discipline master programs that provide knowledge growing influence of each factor on the quality of grain, potato, vegetables, influence the timing collection and other logistic processes (refining, storage) and commodity, food and biological value of each type of crop production - designed for use both in fresh and processed form.

**Sphere of graduates employment**

Admission to PhD program of NULES of Ukraine and other higher educational establishments, employment in advanced agricultural industrial enterprises, scientific-research establishments of NAAS of Ukraine.

***Master program “Energy conservation techniques in fodder production”***

The program provides for grounding and development of elements of energy and resource conservation techniques in fodder crop growing and fodder production at meadows and pastures as economically as possible.

**Sphere of graduates employment**

Admission to PhD program of NULES of Ukraine and other higher educational establishments, employment in advanced agricultural industrial enterprises, scientific-research establishments of NAAS of Ukraine.

**Master program of applied biology  
specialization “Laboratory work”  
for expert control sphere of employment**

***Master program “Methods for genetic control of plant”***

The master's program provides theoretical and practical study of modern methods of diagnosis and biological control of biological objects – seeds, breeding material, and other products, equipment principles molecular genetic laboratories, the organization of work in the lab, basic concepts in the field of metrology, standardization and certification principles kinetic, biochemical, biological methods, current approaches create genetically modified organisms, especially their comprehensive diagnosis in raw materials and in consumer products, molecular markers, their types and methods of application.

**Sphere of graduates employment**

Admission to PhD program of NULES of Ukraine and other higher educational establishments, employment in advanced agricultural industrial enterprises, scientific-research establishments of NAAS of Ukraine. Agricultural enterprises of different ownership, regional and district administration, advanced farms, companies, holdings and corporations, scientific-research establishments of NAAS of Ukraine.

**Practical training**

Students have the main course a practical educational in scientific-researches farms of NULES of Ukraine: SD of NULES of Ukraine “Agronomy research station”, “Velikosnitinske scientific-research farm named aster O. Musichenka”, SRF “Vorsel” and leading agricultures firms different forms, educational-scientific laboratories of NULES departments and some scientific-research organization of NAAS and NAS of Ukraine.

---

**Proposed Topics for Master Theses**

1. Impact of agriculture on soil fertility and productivity of corn in the Forest-Steppe of Ukraine of Ukraine.
2. Indicators of soil fertility and productivity of winter wheat depending on farming systems.
3. Forming of Fodder Production of Legume-Grass Herbage Mixtures
4. Productivity of Lucerne depending on variety and level of mineral nutrition
5. Improvement of sunflower cultivation technology elements in right-bank forest-steppe of Ukraine.
6. Quality and yielding capacity of maize grain depending on biologization factors of cultivation technology elements.
7. Realization of soya bean varieties genetic potential due to technological methods of cultivation on typical black soils.
8. Changing technological quality of winter rye during post-harvest ripening and storage.
9. Influence of varietal characteristics and regimes of storage on commodity indices of potato in the economy
10. Formation of maize hybrids productivity depending on technological methods of cultivation

**Academic rights of applicants for a master program**

Exception agronomists' specialty applicants with bachelor's degree may be entered on such specialties:

- 8.09010102 – Agrochemical and Soil Science (see p. 41);
- 8.09010104 – Fruit and Vegetable Science and Viticulture (see p. 51);
- 8.09010105 – Selection and Genetics of Agricultural Crops (see p. 65).

specialties in the **branch of knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality management, standardization and certification", Master's program "Quality management of plant production, water, soil and pesticides" (see p. 176);
- 8.18010021 – "Pedagogy of Higher School", Master's program "Methodical of science of circles disciplines in plant and processing's productions" (see p. 434);
- 8.18010018 – "Administrative managements", Master's program "Management of horticultural, vegetables and greenhouses markets" (see p 3977);
- 8.18010020 – "Management of educational institutes" (see p. 427).

**Curriculum for specialist training of the educational and qualification level "Master" in specialty "Agronomy "**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Economic and organization of agricultural service	2	108	2,0	3,0
2	Business foreign language	1	72	1,3	2,0
3	Philosophy of science	1	90	1,7	2,5
4	Agricultural and Environmental Law	1	90	1,7	2,5
<i>Total number</i>			360	6,7	10,0
<i>1.2. Cycle of natural science (fundamental) training*</i>					

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
1	Information technology in agronomy	1	144	2,7	4,0
2	Geographic information systems	1	144	2,7	4,0
<i>Total amount</i>			288	5,4	8,0
<i>1.3. The cycle of professional and practical training*</i>					
1	Adaptive farming systems		90	1,7	2,5
2	Methods and organization of research in Agronomy	1	72	1,3	2,0
3	Prediction and programming of yields of agricultural crops	1	72	1,3	2,0
4	Biotechnology in crop production	1	72	1,3	2,0
5	Special genetics	2	72	1,3	2,0
6	Systems of modern intensive technologies	2	144	2,7	4,0
7	Labor protection in the branch	1	54	1,0	1,5
8	Innovative technologies in crop-growing products post harvest handling, storage and processing	2	72	1,3	2,0
<i>Total number</i>			648	12,0	18,0
Total according to regulatory part			1296	24,0	36,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
1.3.Cycle of professional and practical training*					
The cycle of disciplines "Agro-economical reasoning of organization and technologies of crop-growing products production"					
1	Modern systems of ecological agriculture	2	126	2,3	3,5
2	Innovative technologies in crop-growing	2	108	2,0	3,0
3	Agro-technologies of development and use of forage lands	2	126	2,3	3,5
4	Field crops varietal resources	2	90	1,7	2,5
5	Regulatory support of branches of crop-growing products storage and processing	2	90	1,7	2,5
<i>Total chosen by university</i>			540	10,0	15,0
The cycle of disciplines "Reduction of losses, quality improvement on the stages of post harvest handling, storage and primary processing of crop-growing products which will ensure their high venality"					
1	Post harvest handling, storage and transportation of crop-growing products	2	198	3,7	5,5
2	Commodity of crop-growing products	2	180	3,3	5,0
3	Techno-chemical control of crop production	2	162	3,0	4,5
<i>Total chosen by university</i>			540	10,0	15,0
The cycle of disciplines "Scientific reasoning of organization and technologies of crop-growing products production"					
1	Scientific reasoning of farming systems	2	126	2,3	3,5
2	Theory of agro systems sustainability	2	108	2,0	3,0
3	Ecologization of technological processes in fodder production	2	126	2,3	3,5
4	Genetic-selection aspects of breeding varieties	2	90	1,7	2,5
5	Scientific aspects of the management quality of plant products during storage and processing	2	90	1,7	2,5
<i>Total chosen by university</i>			540	10,0	15,0
The cycle of disciplines "Scientific principles of long-term storage of fruit, vegetables, industrial raw materials seeds. Methods of obtaining biologically valuable and ecologically safe products of primary processing"					
1	Research methods of storage and processing of plant products	2	144	2,7	4,0
2	Biochemical changes in crop production during storage	2	180	3,3	5,0
3	Scientific substantiation technologies post harvest handling, storage and transportation of crop production	2	216	4,0	6,0
<i>Total chosen by university</i>			540	10,0	15,0



**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>2.2. Disciplines chosen by students</b>					
<i>2.2.1. Cycle of professional and practical training *</i>					
<i>Production oriented disciplines</i>					
<b>Master program "Organic agriculture"</b>					
1	Scientific aspects of agriculture	3	90	1,7	2,5
2	Crop rotation in modern agriculture	3	108	2,0	3,0
3	Resource-saving technologies of mechanical tillage	3	90	1,7	2,5
4	Integrated weed control in modern agriculture	3	90	1,7	2,5
5	Agro-economic studies and the development of adaptive systems of agriculture	3	90	1,7	2,5
<i>Total selected by the students</i>			<b>468</b>	<b>8,8</b>	<b>13,0</b>
<b>Master program "Applied herbology"</b>					
1	Segetal and ruderal vegetation	3	108	2,0	3,0
2	Agrophytocenosis monitoring and prediction of weeds in crops	3	90	1,7	2,5
3	Management of weedy field component agrophytocenoses	3	90	1,7	2,5
4	Scientific aspects of herbology	3	90	1,7	2,5
5	Scientific grounds of weed control in agrophytocenoses	3	90	1,7	2,5
<i>Total selected by the students</i>			<b>468</b>	<b>8,8</b>	<b>13,0</b>
<b>Master program "Manufacture and marketing of fodder crop production"</b>					
1	Field and meadow fodder production	3	144	2,7	4,0
2	Energy saving technologies of fodder production	3	108	2,0	3,0
3	Growing of fodder plants for sowing methods of their quality defining	3	108	2,0	3,0
4	Technological and marketing bases of fodder production	3	108	2,0	3,0
<i>Total selected by the students</i>			<b>468</b>	<b>8,8</b>	<b>13,0</b>
<b>Master program "Production and marketing of industrial crops"</b>					
1	Marketing and technological grounds of industrial crops production	3	162	3,0	4,5
2	Seed science and methods of seed quality evaluation for industrial crops	3	162	3,0	4,5
3	Phytoenergetics	3	144	2,8	4,0
<i>Total selected by the students</i>			<b>468</b>	<b>8,8</b>	<b>13,0</b>
<b>Master program "Production and marketing of cereal crops"</b>					
1	Technological and marketing grounds of cereal crops production	3	180	3,4	5,0
2	Seed science and methods of cereal crops seed quality estimation	3	144	2,7	4,0
3	Energy and raw phytoresources	3	144	2,7	4,0
<i>Total selected by the students</i>			<b>468</b>	<b>8,8</b>	<b>13,0</b>
<b>Master program "Transportation, storage and processing of plant products"</b>					
1	Standardization and certification of processed crop material	3	90	1,7	2,5
2	Processing grain and industrial raw materials	3	144	2,7	4,0
3	Processing of fruits and vegetables	3	144	2,7	4,0
4	Material and technical base for storage and processing of plant products	3	90	1,7	2,5
<i>Total selected by the students</i>			<b>468</b>	<b>8,8</b>	<b>13,0</b>
<b>Master program "Methods for genetic control of plant"</b>					
1	Ecological genetics and special genetics of plant	3	72	1,3	2,0
2	Laboratory work	3	72	1,3	2,0
3	Methodology and technical support modern genetic research	3	72	1,3	2,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
4	Molecular Diagnostics in crop production and environmental management	3	72	1,3	2,0
5	Systems analysis as objects of the environment and plant production	3	90	1,7	2,5
6	Transgenic technology, DNA technology of plant	3	90	1,7	2,5
<i>Total selected by the students</i>			468	8,8	13,0
<i>Research oriented disciplines</i>					
Master program "Agricultural crops productivity formation management"					
1	Ecology and biology of agricultural crops	3	180	3,4	5,0
2	Biometry	3	90	1,7	2,5
3	Seed science	3	108	2,0	3,0
4	Methods and organization of research work in crop science	3	90	1,7	2,5
<i>Total selected by the students</i>			468	8,8	13,0
Master program "Theoretical foundation and development of energy-efficient ecological agriculture in Ukraine"					
1	Zonal farming systems	3	108	2,0	3,0
2	Scientific aspects of agriculture	3	72	1,3	2,0
3	Theoretical and applied herbology	3	108	2,0	3,0
4	Ecological problems in farming	3	108	2,0	3,0
5	Methods and organization of research in agriculture	3	72	1,3	2,0
<i>Total selected by the students</i>			468	8,8	13,0
Master program "Theory and practice of controlling weed-infested farmland"					
1	Theoretical foundations of herbology	3	108	2,0	3,0
2	Biology and ecology of weeds	3	90	1,7	2,5
3	Monitoring and forecast of weed-grown farm land	3	90	1,7	2,5
4	Systems of controlling weed	3	108	2,0	3,0
5	Methods of research in herbology	3	72	1,3	2,0
<i>Total selected by the students</i>			468	8,8	13,0
Master program "Energy conservation techniques in fodder production"					
1	Scientific-technical backgrounds of fodder production	3	144	2,7	4,0
2	Fodder production biologization	3	90	1,7	2,5
3	Management of fodder crop quality in technological process	3	144	2,7	4,0
4	Methods and organization of research in fodder production	3	90	1,7	2,5
<i>Total selected by the students</i>			468	8,8	13,0
Master program "Quality of crop production depending on factors of postharvest handling, storage and processing"					
1	Processing of crop products	3	144	2,7	4,0
2	Commodity of raw materials and processed plant products	3	126	2,3	3,5
3	Technical biochemistry	3	108	2,0	3,0
4	Quality management and certification of plant products	3	90	1,7	2,5
<i>Total selected by the students</i>			468	8,8	13,0
Total number of elected part			1008	18,7	28,0
Practical training			468	8,7	13,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			3240	60,0	90,0

\*Names of disciplines' cycles according to the requirements of industry standards for higher education, approved on 27.08.2010, EQC and EPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. *Cycle of humanitarian, social and economic training\**

**Economic and organization of agricultural service.** This object provides for economic efficiency of agricultural service in market relations. Future specialists know the specifics of economic and business relations between agricultural enterprise.

**Business foreign language.** The course is aimed at the communicative and professional skills in foreign language. Practical language skills are an essential organic component of modern training institutions of higher education. Learning a foreign language in non-linguistic institution, pursuing practical goals are inextricably combined with general and educational objectives. Learning a foreign language in high school promotes educational and professional level.

**Philosophy of science.** The course is highlighting the specifics of philosophy of science as the special type of humanitarian knowledge and as one of learning a subject. The characteristic of historical development of science and philosophy of science is given. The main problems of general and scientific methodology, structure of cognition process, scientific ethics, scientific world outlook content and development are discussed. The special attention is paid to problems of modern science and possible ways of its interaction with another spheres of society, as well as to problems of biological science and ecology. The course is notable for it's outlooking orientation, which allows to synthesize acquired knowledge in specialized subject and in the humanities, in the integral scientific world perception - the theoretical basis of the magisterial specialists schooling level.

**Agricultural and Environmental Law.** On the modern stage of reformation of agricultural sector of economic professional preparation of specialists in industry of agriculture, well-informed in legal questions, acquires an actual value. In this connection the task of increase of the level of knowledge appears by the master students in the agricultural-legal, land-legal and ecology-legal relations. It needs the development and introduction to the educational process of agricultural higher educational establishments and faculties of legal disciplines, in particular, disciplines of the « Agricultural and ecological law». The purpose of the course of «Agricultural, land and ecological law» is to form a system of knowledge from the legal regulation of agricultural relations, legal providing of economic activity of agricultural enterprises, landownership and land-tenure, guard of the natural environment, rational use of natural resources, providing of ecological safety.

#### 1.2. *Cycle of natural science (fundamental) training\**

**Information technology in agronomy.** The course introduces students to the concept of information technology, information systems, their value, basic components, the methods and technologies of information technology in gardening and horticulture. During laboratory acquired modern program for processing of the different types and applications to analyze data related to vegetable gardening. Most of the course is devoted to the study of the most common information technologies that allow the agronomy specialists to solve problems, analyze their results and make the right decision.

**Geographic information systems.** The course includes basics of geographical information systems and spatial analysis. Practical applications of geoinformation technologies for simulation, forecast and monitoring in agronomy and agriculture are reviewed.

#### 1.3. *Cycle of professional and practical training \**

**Adaptive farming systems.** An aim of study of discipline consists in forming in Master's course students knowledge and abilities of scientific bases of the systems of

agriculture, modern environmentally safe and economically expedient measures of agrotechnics of growing and protection of agricultural crops, planning of rational crop rotations, tillage systems and erosion control measures, peculiarities of adaptive systems for industrial, soil protective, ecological, biological (organic) farming and farming on contaminated areas. In a course scientific bases of farming systems and history of their development, condition of introduction of adaptive farming systems: optimization of placing agricultural crops, perspective of soil tilling, application of fertilizers, mode of organic substance of soil, optimization of plant protection, land-reclamation in the system of adaptive farming, principles of forming of technologies of growing agricultural crops, requirement to the technical equipments, conforming of farming to the requirements of nature protection, features of forming of the adaptive systems of farming in the different soil-climatic zones of Ukraine are clarified .

**Methods and organization of research in Agronomy.** Objective of the course is acquirement by students the methodology, methods and technique of scientific research in agronomy. Object of study – is methodology of scientific-research work in agronomy. Subjects of study – are planning and organization of research work in agronomy, peculiarities of method elements of research of certain problems in agronomy – crop rotation, soil tillage, fertilization, application of pesticides, melioration and soil protection from erosion, cultivation technologies for field, vegetable, fruit, forage crops and pastures, research in plant selection, storage of plant products, methods of statistic examination of experimental data.

**Prediction and programming of yields of agricultural crops.** Prediction and programming of yield of agricultural crops basing on principle of establishment of possible level of productivity, which is determined by the biological features of crops, quantitative influence of factors of growth and development of plants, establishment of supply level of these factors in concrete soil-climatic conditions and evaluation of necessity in resources to regulate above mentioned factors.

**Biotechnology in crop production.** The aim of the course is studying and consolidation of students' knowledge in basic directions of current knowledge and perspectives of modern biotechnology. The aim is consolidate knowledge about peculiarities of modern biotechnology to accelerate scientific and technological progress in agriculture, obtaining of somatic hybrids and cybrids, creation of genetic constructs for genetic improvement of agriculturally-valuable plants, obtaining of plants resistant to adverse environmental conditions.

**Special genetics.** Special Genetics is genetics of individual species. It systematizes knowledge of karyological and genomic analysis, genetics and phylogenetics of signs, mutagenesis, polyploidy, heterosis and inbreeding, population genetics and other matter of genetics of this kind. "Special Genetics" course was designed to show students the basic nature of the inheritance of quantitative and qualitative features of species. In this course main issues of Special Genetics of field crops grown in Ukraine: grains, legumes, cereals, industrial, oil, forage crops are shown. This course includes general information on biology, morphology and ecology of agricultural crops and information about source material and areas of genetic research of these crops.

**Systems of modern intensive technologies.** Studying of this course will enable future specialist to solve the problems in application of modern intensive technologies of agricultural crops cultivation. The major of "System of modern intensive technologies" educational course is acquirement of theoretical and applied skills to develop technological elements of field crops cultivation based on thorough knowledge of biological peculiarities of crop, its growth and development, acquaintance with the most applicable technologies in agriculture.

**Labor protection in the branch.** It is normatively applied discipline, that on the basis of analysis of production and harmful factors, caused by production processes in

agriculture, offers the scientifically grounded organizational and technical measures to prevent an accident rate, injures, professional diseases of workers.

**Innovative technologies in crop-growing products post harvest handling, storage and processing.** Academic discipline permits students to penetrate into the essence of innovative technologies of post harvest handling, storage and processing of the major types of grain, vegetable, industrial products, to study features of handling, storage and processing technology of each type of crop-growing product. It will ensure crop-growing products handling, storage and processing with minimal losses and obtain ecologically safe products. Academic discipline is based on the knowledge of bases of physiology, plant biochemistry, microbiology, chemistry, crop-growing, vegetable growing, fruit growing, storage and processing technology. In turn, it is the base for the disciplines of economics, mechanization, electrification, automation, which have as their object studying of the processes of post-harvest handling, storage and processing of crop-growing products.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.2.1. Cycle of professional and practical training \*

*The cycle of disciplines "Agro-economical reasoning of organization and technologies of crop-growing products production"*

**Modern systems of ecological agriculture.** Objective of the course is acquirement of knowledge and skills to develop system of ecological farming adapted to the conditions of the particular farm. Object of study – is a system of ecological farming of particular farm. Subjects of study – are laws of ecological agriculture, methodology of development of ecological farming system for particular farm, evaluation of husbandry and economic efficiency of farming system, analysis of potential risks of anthropogenic impact on agricultural landscape.

**Innovative technologies in crop-growing.** Describes essence of modern adaptive, energy- and resource-saving, economically effective, safe innovative technologies of agricultural crops cultivation, taking into account biological features of highly productive varieties of intensive type and zonal peculiarities.

**Agro-technologies of development and use of forage lands.** Subject program provides development of intensive thicknesses of grass on arable and natural forage lands.

**Field crops varietal resources.** Discipline gives Master course students deep knowledge of plant varietal resources to equip them with information on availability, distribution and formation. Study of the discipline includes following topics: the role of varietal resources in sustainable crop development, and national food security, their creation and maintaining basic forms; world legislation about varietal genetic resources (international genetic centers), the system of varietal plant genetic resources in Ukraine, methods of identifying varieties and varietal formation of national resources; qualifying inspection with determination of suitability indices of varieties to spread in Ukraine and determination of patentability criteria, standardization and certification of seeds, control of cultivation and storage of high-quality seeds.

**Regulatory support of branches of crop-growing products storage and processing.** Discipline includes studying of following problems: introduction and development of basic normative documents which regulate processes of storage and processing of crop-growing products, basic requirements for creating quality management systems at the primary processing enterprises.

*2.2.1. The Cycle disciplines “Reduction of losses, quality improvement on the stages of post harvest handling, storage and primary processing of crop-growing products which will ensure their high venality”*

**Post harvest handling, storage and transportation of crop-growing products.**

Subject gives characteristics (physical and physiological) of major groups reared in crop production, horticulture, gardening products. Teaches the basic principles of stabilization (preservation) of any product. Based on the knowledge gained features yield of certain crops and the basic principles of stabilization future studies expert mode select short-term or long-term storage transportation. Teaches techniques you can use to bring the yield of major crops to a stable state. Teaches how the introduction of a certain mode of keeping and creating an environment compliance regime under which the storage losses as the quality and quantity will be minimal.

**Commodity of crop-growing products.** The subject teaches the order of conclusion and performance of contracts for grain, vegetables, potato, technical materials, requirements of commodity levels of main grains for different purpose. Teaches techniques by which determine the identity of commodity products to a particular class of grain, class of vegetables and fruit. Consider techniques to determine standardization of sugar beet, raw flax numbering. Teaches the rules of settlement realized grain, raw oilseed, potato tubers of different purpose, vegetables, pome fruit, stone fruit and berries. Teaches basic regulations concerning implementation of commodity grain, vegetable and industrial raw materials.

**Techno-chemical control of crop production.** In this course Master students study biochemical significance of harvest of major crops and tasks of technochemical control in the stages of primary processing, industrial processing and storage of basic types of flour, cereals and oilseeds, fruit and vegetable crops, potato, industrial raw materials – flax, hops, tobacco, shag, sugar beets, and grapes. Based on knowledge of physiology, microbiology, plant pathology, fruit, vegetable, standardization, crop storage technology and Vegetables discipline teaches the methods of controlling crop production based on thorough knowledge of the product, taking into account their changes depending on factors that can act on it during transportation, post harvest refinement, storage and processing.

*2.1.3. The cycle disciplines “Scientific reasoning of organization and technologies of crop-growing products production”*

**Scientific reasoning of farming systems.** The subject involves formation of gist of farming systems, the theoretical basis of their formulation and implementation components of farming systems and how valuable their content for future Masters of research direction. The theoretical basis of farming systems are the laws of agronomy, biology and agriculture. Moreover academic discipline forms theoretical basis which provides students with the basic components of farming systems, such as: crop rotation, mechanical tillage systems, fertilization systems, integrated crop protection from pests (weeds, pests and diseases), erosion control systems and agro-ecological measures which protect of soil pollution, environment and agriculture products.

**Theory of agro systems sustainability.** Educational course provides learning of theoretical basis of origin, formation and functioning of ecosystems in general and agricultural systems in particular, structure and properties of ecosystems. Educational course clarify principles of agrocenosis of field crops sustainability through the knowledge in plant biology and physiology, demands to environmental factors and regularities of formation of yield and its quality. Creation of scientific grounds of bioresources, rational use and forecast of changes in biosphere through anthropogenic factor.

**Ecologization of technological processes in fodder production.** Elements and technologies with minimal use of agrichemicals are pointed; the problems of getting pollutant free forage and environmental conservation are explained.

**Genetic-selection aspects of breeding varieties.** Domestication of plants. Distribution. The law of homologous series of genetic variability. Directions of selection. Yield, quality of products. Resistance to diseases. Hybrid selection. Hybridization and its importance in selection. Saturating crossing. Using CMS, incompatibility. Selection - science and art. Use of genetic markers.

**Scientific aspects of the management quality of plant products during storage and processing.** Discipline includes study of such questions, basic of normative documents which regulate effective the quality management in the storage and processing of plants productions, requirements regarding the quality raw and processed products.

*2.1.4. Cycle of subjects "Scientific principles of long-term storage of fruit, vegetables, industrial raw materials seeds. Methods of obtaining biologically valuable and ecologically safe products of primary processing"*

**Research methods of storage and processing of plant products.** Discipline studied at the final stage of the masters. Significant amount plant products grown by the time of remains in the economy. With its storage there are changes in quality, of natural losses that must be considered for each product. In this connection it is necessary of storage control samples, which carried accounting losses, determine the change in quality depending on the type of product, the actual term storage method. This discipline studies methods of research in storage and processing products of crop production, gardening, vegetable growing.

**Biochemical changes in crop production during storage.** Discipline provides knowledge about the growing influence of factors: farming, agro-chemical, meteorological and biochemical composition, technochemical properties, suitability for storage and processing of the yield. Discipline teaches characteristics biochemical composition of different species, varieties of potato, vegetables, fruits, flour, cereals, pasta raw materials grown under different conditions. Teaches basic properties of groups of substances (carbohydrates, proteins, fats), vitamins and minerals. Discipline provides knowledge of quantitative content in crop production, vegetable production, horticulture substances that make up its food and biological value. Teaches standards needs of the human body in various substances and by ensuring the body through the use of different ingredients crop production – both fresh and canned. Teaches ways to stabilize the biological value of the storage and processing of grain, fruit and vegetable raw materials.

**Scientific substantiation technologies post harvest handling, storage and transportation of crop production.** Discipline teaches the latest scientifically based technologies that provide high quality portfolio processes (cleaning, drying) - minimum traumatized, high vitality food grain and seed setting. Teaches scientifically sound logistics schemes portfolio yield of potatoes, vegetables, pome fruits, which provide high value commodity in the implementation. Teaches scientifically sound technologies handling, storage of all kinds of industrial raw materials, which will provide the maximum yield of finished products – sugar, starch, oil, etc. Discipline teaches research methods and modes of storage, taking into account the conditions of cultivation, harvesting, and post harvest handling of grain mass, mass lush production and other plant material.

2.2. *Disciplines chosen by students*

2.2.1. *.Cycle of professional and practical training\**

*Production oriented disciplines*

**Master program “Organic agriculture”**

**Scientific aspects of agriculture.** Academic discipline involves the formation of master production oriented theoretical foundation of agriculture, the theoretical basis for development and implementation of agricultural technologies that make up a complex system of agriculture farming practices and how valuable their content. The theoretical basis of the laws of agriculture agronomy, biology and agriculture. Besides training course to equip the student provides the theoretical basis for the development and implementation of the main components of farming systems, such as: crop rotation, mechanical tillage systems, fertilization systems, integrated crop protection against pests of erosion control measures and agro-environmental measures on soil pollution, environment and agricultural products.

**Crop rotation in modern agriculture.** Lecture course covers the theoretical basis of crop rotation, crop rotation in different natural and economic conditions and their practical application in Ukraine, intermediate crops in crop rotations and study their possible application, implementation and development of crop rotation, especially the use of short rotation crop rotation and practical recommendations opportunities to transform multiple-rotation in short rotation, the practical application of crop rotation crop rotation just in time. This goal will be achieved, namely shape future professionals develop practical skills in the crop pattern, crop rotation design, their development and use this knowledge in practice for making production decisions.

**Resource-saving technologies of mechanical tillage.** It highlights the scientific basis of resource saving technologies of mechanical tillage and their practical application in different soil - climatic zones of Ukraine; theoretical foundation soil, the basic theoretical principles of scientific and practical value farming systems: their historical development, ways to address the expanded reproduction of soil fertility; rational land use, protection against erosion and obtaining sustained high yields of crops in different soil-climatic zones of Ukraine

**Integrated weed control in modern agriculture.** Objective of the course is familiarization of specialists with knowledge and skills of weed species identification, their biological properties, methodology of weed seedlings appearance forecast and development of control system integrated in modern technologies of crop cultivation. Object of study – is weed faction of agrophytocenosis. Subjects of study – are identification of weed species, seedlings appearance forecast, herbological terrain mapping, variety of regulative and killing measures of weed control, algorithm of development of integrated system of weed control, ecological control in applied herbology.

**Agroeconomic studies and the development of adaptive systems of agriculture.** Purpose of the discipline is to build in master knowledge and skills of agroeconomic rationale and design of farming systems, adapted to specific soil and climatic, economic and social conditions of the economy, filling them with modern environmentally safe and economically feasible measures farming cultivation and crop protection, rational design of crop rotations, tillage systems and resource-erosion measures, the characteristics of adaptive management systems for industrial, soil, environmental, biological (organic) farming and agriculture in affected areas.

**Master program “Applied herbology”**

**Segetal and ruderal vegetation.** The purpose of the discipline is shaping the future specialists of knowledge about the biological characteristics and environmental requirements of weeds at a plant population and the association as a basis for the

---



development of evidence-based environmentally and economically acceptable weed control in agrophytocenosis. Based on the knowledge the student should be able to: identify the species of common weed species in Ukraine in the vegetative state and determine their seed weed associations in agricultural crops, Phytocenological determine the role of weed species in the community as a selection criterion problematic weed species, to assess compliance with environmental culture requirements for environmental characterization of a specific field.

**Agrophytocenosious monitoring and prediction of weeds in crops.** Lecture course on discipline-oriented coverage of theoretical foundations and methodology of monitoring of the presence of vegetation in field weeds agrophytocenosis and the prediction of weed-infested farmland under production conditions. Topics laboratory practical course provides students gaining practical skills in these types of activities on industrial crops, as well as analysis and evaluation of the results of monitoring and prediction of weed-infested farmland.

**Management of weedy field component agrophytocenoses.** Lecture course on the subject "Management of weedy field component agrophytocenoses" focused on learning activities and systems level control component in the presence of weedy field agrophytocenoses. Topics laboratory practical course provides the students acquiring practical skills select individual events and develop an integrated management system component in the weedy field agrophytocenoses of agriculture in different systems in different climatic zones of Ukraine.

**Scientific aspects of herbology.** Lecture course aimed to cover theoretical principles of modern herbology formation of students' systematic understanding of the role and place value vegetation of the agrophytocenoses. Describes the relationship between the system components agrophytocenoses, laws and rules of its formation and development, and the impact on them of modern control measures in different growing technologies. Topics laboratory practical course provides students gaining practical skills in the use of consistent growth and development component weedy field agrophytocenoses as the biological basis for developing cost-effective and environmentally acceptable control systems-level presence of weeds in agricultural crops in different growing technologies and systems agriculture.

**Scientific grounds of weed control in agrophytocenoses.** In the lecture course discipline "Scientific Basis of weed control in agrophytocenoses" highlights modern scientific principles controlling weeds in crops of agricultural crops in different farming systems. Topics laboratory practical course provides students acquiring practical skills to use provisions scientific basis for monitoring the development and implementation of efficient farms, environmentally sound and economically acceptable weed control systems on agricultural land.

#### **Master's program "Manufacture and marketing of fodder crop production"**

**Field and meadow fodder production.** Subject program provides studying of biological peculiarities, economic value of fodder crops, as well as studying intensive technologies of their growing and fodder conservation.

**Energy saving technologies of fodder production.** They are indicated the ways of fodder production intensification in the context of introduction of alternative energy and resource saving technologies of fodder plant growing, and production of high quality, cheap safe fodder of them without doing harm to the environment.

**Growing of fodder plants for sowing methods of their quality defining.** Subject program provides for explaining the essence of adaptive, economically profitable, environmentally friendly technologies of fodder crop growing for sowing.

**Technological and marketing bases of fodder production.** Subject of the program provides to study technologies of field fodder crop growing in modern market conditions.

**Master program “Production and marketing of industrial crops”**

**Marketing and technological grounds of industrial crops production.**

Educational course highlights ecological and economic principles of placing of industrial crops in rotation, use, origin, location, productivity, volumes of production of industrial crops. Describes classification, morphological, anatomical and biological peculiarities of industrial crops and requirements to conditions of cultivation. Describe essence of adaptation, economy favourable, ecologically secured technology cultivation of every crop according to a zone: characterizing placing of every culture in rotation, system of fertilizer application, system of soil tillage and seeds preparation, control of weeds, diseases and pests, harvesting and primary processing of productions.

**Seed science and methods of seed quality evaluation for industrial crops.**

Discipline include theoretical and practical grounds of inspector service, selection and genetic, seed science, crop science, yield forecast and other branches of classical and modern agronomy, essential for seed science and industrial crop seed quality evaluation. As a result of study of this educational course student should learn methods of seed and seeding material production for main industrial crops, documentation on seeds and sowing qualities of seeds. Provide calculations of farm supply with seeds and seeding material. Evaluate quality of seed and seeding materials.

**Phytoenergetics.** Educational course studies theoretical grounds and practical measures of renewable energy production from phyto-raw. Biological and technological peculiarities of cultivation of different plants – sources of raw suitable for production of various types of bio fuel: solid bio fuel, biogas, bio ethanol, biodiesel. Harvesting, processing and raw quality evaluation. Principal schemes of bio fuel production.

**Master program “Production and marketing of cereal crops”**

**Technological and marketing grounds of cereal crops production.** Educational course takes an important place in system of specialists education. It studies diversity of field crop forms, peculiarities of its biology and physiology, demands to environmental factors, regularities of yield quality and quantity formation, develop system of modern methods of obtaining of high, sustain, economically valuable and environmentally friendly yields of high quality in zonal and varietal aspects calculated according to the level of environmental factors supply. Educational course forms appropriate professional view, system of applied and theoretical knowledge, skills to apply it in scientific and practical activity taking into account ecological expediency.

**Seed science and methods of cereal crops seed quality estimation.**

Educational course consider studying of up to date state of modern technologies of growing, processing and storage of high quality seeds of field crops, domestic and international legislative base of production, trade and use of seed and seeding material, methods of estimation of seeding quality of seeds, internal and state control of seed production, use and trade on all stages.

**Energy and raw phytoresources.** Educational course forms future specialists in prospective branch of crop production – production and processing of multipurpose vegetable raw. Include acquaintance with gene fund (species and varietal diversity), yielding potential and productivity of energy and raw crops, biological, ecological and biochemical peculiarities of plants, output of main and by-products, essential substances and energy from square unit and also peculiarities of cultivation, harvesting and processing of multipurpose plants. It is based on knowledge about resource potential of plants, peculiarities of their growth and development, reaction on environmental factors,

---

modern technologies that provides obtaining of high yields with best quality and lowest material, energy and economical expenses. High value placed on bioecologization of cultivation technologies that provides reduction of pesticide load onto agrophytocoenosis, enhancing soil fertility due to potential of cultivated crops and green manure crops.

**Master program “Transportation, storage and processing of plant products”**

**Standardization and certification of processed crop material.** Discipline including study thus questions purpose and task standardization in processing industry and methodological basis of standardization in processing industry, the question of the quality of processing with of plant raw, information on national and international experience of quality management on primary processing enterprises, food processing certification. Compiling the content of courses taken into account the laws of Ukraine on standardization and safety of plant products.

**Processing grain and industrial raw materials.** Discipline is the basic discipline of Master’s program. Teaches techniques of different outputs, varieties of wheat and rye flour. Teaches techniques of cereals used in rural shellers, including: millet, buckwheat, barley, pea, oat meal. Teaches storage mode as raw materials and finished products from grain. Teaches methods of processing in rural oil-mills, different types of oilseeds, which are grown in Ukraine (sunflower, canola, flax, mustard). Discipline teaches modes of storage of raw materials and finished products (oil cake). Discipline teaches techniques of primary processing of raw flax, storage of raw materials (flax) and finished products (trusts, fiber). Students depending on the kind of future can master the technology of primary portfolio hops, tobacco, shag, aromatic raw materials.

**Processing of fruits and vegetables.** Discipline is one of the basic forms that master's program. Teaches in what ways and under what regimes store fruits and vegetables to get a high quality finished product. Teaches methods of processing based on cenoanabiosis, modes and methods of storage of finished pickled, salted products. Gives knowledge of technology of fruit and berry juices and sauces production. Teaches methods and modes of drying fruit and vegetables, including the most common features of dry material (apples, stone fruits, etc.). And ways and modes of storage of dried fruit. Teaches ways and modes of storing dry vegetables (carrots, onion, beet, etc.). And storage of finished products. Teaches characteristics of manufacturing frozen fruits and berries. Discipline gives knowledge of technologies for natural canned fruits and berries and vegetable production, with technologies canning fruits and berries by sugar and other chemical preservatives.

**Material and technical base for storage and processing of plant products.**

Material and technical base for storage and processing of plant products is special a discipline that studies the equipments and buildings which used for the storage and processing of crop production and technological properties of granaries, vegetable stores, freezers, refrigerators and buildings for the storage of canning products, equipment for production processing plant products (cereals, pulses, oilseeds, technical crops, fruits and vegetables).

**Master program “Methods for genetic control of plant”**

**Ecological genetics and special genetics of plant.** This course of lectures for masters is based on genetic approaches to the study of ecological relationships. This course based on this principle in environmental genetics and genetics discussed in detail special independent research areas such as genetic control of environmental relations and variability characteristics of sensitivity to environmental factors and factors of biological nature. The course provides a historical perspective of the ideas and methods of biological science.

**Laboratory work.** The purpose of teaching – to give students an idea of legal, organizational, technical and methodological aspects of the establishment and functioning of the laboratory of molecular diagnostic analysis of crop production and other laboratories with similar objectives and activities, implementation and operation of the quality management system of laboratories; provide practical skills in applying the principles and methods of formation and functioning of the laboratory, the use of specific methods and approaches for solving control of qualitative and quantitative indicators and signs.

**Methodology and technical support modern genetic research.** The purpose of teaching to give students a thorough understanding of the modern platform of genetic analysis, basic facilities and platforms for primary nucleotide sequence genomes of slice genetic analysis, sophisticated tools for microscopy and molecular imaging processes provide practical skills bioinformatics analysis sequencing and analysis of genomes.

**Molecular Diagnostics in crop production and environmental management.** The purpose of teaching – to give students an idea of the principles and methods of molecular diagnostic tests, their scope in the field of genetic analysis, the principles of the application of molecular diagnostic methods in the analysis of genotypes and seed quality, solving the formation of new high value genotypes of plants and quality control of reproduction of these genotypes. Develop skills to use molecular techniques to create new genotypes of plants and labeling agronomic traits.

**Systems analysis as objects of the environment and plant production.** The aim of the course to introduce students to the methodology of the study of the properties and relations on objects that are difficult to computerization observed by representing these objects as purposeful systems, provide practical skills application system methodology for the analysis, modelling and design of complex natural objects at different levels of organization of living matter, of computer information systems and works with existing, solving information problems in them develop skills using practical methodologies systems analysis for Logical-physical modeling and design of computer information systems, in the form of future specialists systemic thinking.

**Transgenic technology, DNA technology of plant.** Academic discipline “Transgenic technology, DNA technology of plant” is one of the special disciplines that study in “Breeding and Genetics agriculture crops”. The current crop is largely based on advances in molecular biology, knowledge of the molecular organization of the vital processes of cells and organisms. The development of molecular biology has led to the development of new methods and approaches in working with plant organisms that have the title “DNA technology”. These technologies include methods for working with DNA in vitro, creating recombinant DNA molecules, creating new forms of plants containing artificially entered, DNA, molecular-genetic analysis of plant-based form of knowledge about the structure of DNA and so on.

*Research oriented disciplines*

**Master program “Agricultural crops productivity formation management”**

**Ecology and biology of agricultural crops.** Ecology – is complex subject that studied interrelations of living organisms and their groupings with environment. Object of study – is ecosystem, or localized in space and dynamic in time totality of population of different organisms and environmental conditions that are in continuous interrelation creating system of related biotic and abiotic factors. Nowadays mankind activity actively influence on the environment. People faced with treaty of total ecological disaster. Solving of this problem requires basic knowledge in ecology from every entity of the society. Thus there is obvious necessity in teaching of this course to Master of Science students majoring in agronomy.

**Biometry.** Course of biometry aiming on formation future specialists with creative skills and knowledge for providing research activities in area of plant science. Discipline

based on knowledge about modern technique and technologies of production of high yields of crops with high quality, peculiarities of their development and demands to environment factors. Discipline based on such theoretical disciplines as botany, plant science, fodder production, industrial crops, I&T technologies, yield forecast, principles of research in agronomy, mathematic modelling. As a result of this course student should be able to analyze obtained results of research, plane and process research results with methods of mathematical statistic. Separate results into groups by the distinguish features. Analyze relationships between different properties of biological objects.

**Seed science.** Educational course studying following questions: valid international schemes of varietal certification of seeds as a subject of trade according to OECD schemes, which at the time integrating in domestic legislative base of seed and seeding material production, trade and use; grounds of formation and functioning of world and domestic market of seeds, its modern state, trends and direction of development, peculiarities of price formation on international and domestic markets; valid State Standards and Industrial Standards of Ukraine harmonized according to international standards (ISTA, CEN, OECD, ISO) and ways of integration of domestic system of seed certification into international, control of seed production, trade and use of all types of enterprises according to valid domestic legislative base; modern technologies of growing, processing and storage of high quality seeds of field crops; methods of analyzing of seeding, varietal, yielding qualities of seeds according to international standards.

**Methods and organization of research work in crop science.** Educational course forms appropriate professional ideology for future agronomists, gives theoretical and applied knowledge about basic methods of research, skills personally maintain research activity and statistically estimate obtained results. Educational course teach statistical analyzes of observation data, single and multifactor field trials by methods of Pierson, correlation, regression, probit and covariance.

### **Master program “Theoretical foundation and development of energy-efficient ecological agriculture in Ukraine”**

**Zonal farming systems.** Lecture course on the subject it highlights the scientific basis of farming systems, zonal features of restoring soil fertility, weed spread and how to protect crops from them, the theoretical basis of crop rotation and their practical application in different soil-climatic zones of Ukraine, tillage and erosion protection and zoning features.

**Scientific aspects of agriculture.** Academic discipline involves the formation of master oriented theoretical foundation of agriculture, the theoretical basis for development and implementation of agricultural technologies that make up a complex system of agriculture farming practices and how valuable their content. Theoretical basis of the laws of agriculture agronomy, biology and agriculture. Besides training course to equip the student provides the theoretical basis for the development and implementation of the main components of farming systems, such as: crop rotation, mechanical tillage systems, fertilization systems, integrated crop protection against pests of erosion control measures and agro-environmental measures on soil pollution, environment and agricultural products.

**Theoretical and applied herbology.** Objective of the course is formation of system of knowledge for specialists qualified as “Agronomist-researcher” about regularities of weed faction of agrophytocenosis, interrelations between crops and weeds and measures for their effective control. Object of study – is weed faction of agrophytocenosis. Subjects of study are: morphological and biological properties of weeds, their harmfulness, methodology of weed seedlings appearance, strategy and tactic of their control, variety of controlling and killing measures, technical and economic efficiency and environmental safety measures in applied herbology.

**Ecological problems in farming.** Objective of the course is training specialists qualified at maintaining of analytical and ecological functions of evaluation of ecological situation at agro landscapes and development of measures system and its optimization. Object of study – are nature ecosystems, agro ecosystems and conditioned appropriate systems of agriculture. Subjects of study – are laws of ecological agriculture, measures of solving of ecological problems in agro ecosystems – extended reproduction of soil fertility, erosion control, safe use of agrochemicals, estimation of crop rotation ecological safety, soil tillage, farming systems, ecological monitoring in agriculture.

**Methods and organization of research in agriculture.** Objective of the course is increase in knowledge and acquiring of skills on methodology of scientific research in agriculture. Object of study – is methodology of scientific research in agriculture. Subjects of study – are theoretical substantiation of modern farming systems and its links, peculiarities of methodology elements on efficiency of crop rotations, soil tillage, weed control, systems of agriculture, special statistical methods of research in agriculture: phenomena typicality analysis, estimation of correspondence of actual productivity of arable land to its resource-provided productivity, analyzes of plant growth, estimation of phenomena stability in agriculture.

### **Master program “Theory and practice of controlling weed-infested farmland”**

**Theoretical foundations of herbology.** Lecture course on the subject is aimed at covering theoretical principles of modern herbology, formation of students' systematic understanding of the role, place and value of segetal vegetation in agrophytocenoses. Deep study of relationship between the components agrophytocenoses, laws and rules of its formation and development, and the impact on them of modern control measures in different growing technologies. In theoretical course taught modern classification agrophytocenoses and methodology of scientific study. Topics laboratory practical course provides students acquiring practical skills learning patterns of growth and development component weedy field agrophytocenoses as the biological basis for developing cost-effective and environmentally acceptable control systems-level presence of weeds in agricultural crops in different growing technologies and systems agriculture.

**Biology and ecology of weeds.** Lecture course on the subject focused on coverage and deep study of the biological characteristics and environmental requirements segetal vegetation of Ukraine as a natural basis for development of integrated control measures their level of presence in agrophytocenoses. We present the biological and ecological properties of segetal vegetation and its place in modern agrophytocenoses as a result of environmental and life strategy of growth and development in disturbed man ecotypes. Topics laboratory practical course provides students acquiring practical skills to assess the biological characteristics and environmental requirements of key problems of widows weeds Ukraine and methods for their determination in carrying out research work on herbology, as well as analysis and evaluation of their changes depending on current factors controlling their level of presence in the agricultural lands.

**Monitoring and forecast of weed-grown farm land.** Lecture course on discipline is oriented to clarify theoretical foundations and methodology of monitoring of the presence of vegetation in segetal agrophytocenoses and the prediction of weed-infested farmland. Topics laboratory practical course provides students gaining practical skills in these types of activities in carrying out research work on herbology, as well as analysis and evaluation of the results of monitoring and prediction of weed-infested farmland.

**Systems of controlling weed.** Lecture course on the subject focuses on coverage of theoretical positions forming a system of controlling the level of presence of weedy component agrophytocenoses as bio-economic problem. In theoretical course taught modern classification and biological effectiveness of different control measures weed-

infested and control system development methodology weed-infested crops in different crops. Topics laboratory practical course provides students gaining practical skills in the selection and evaluation of biological efficiency various control measures weed-infested, the methodology of their choice according to real weed-infested in the field.

**Methods of research in herbology.** Methods of Research in herbology are applied discipline Master scientific direction, which ensures their acquisition of theoretical and practical training to the bookmark of field and laboratory experiments, analysis of the experimental results of the research problems herbology. Theoretical course is complemented by practical laboratory sessions where students gain practical skills in planning, bookmarks and development research program in experiments with problems herbology.

### **Master program “Energy conservation techniques in fodder production”**

**Scientific-technical backgrounds of fodder production.** Subject program provides for explaining the essence of potential opportunities of fodder plants and development of intensive elements, reasonable in the context of energy and resource saving, technologies of fodder plant growing and production of high quality fodder on their basis.

**Fodder production biologization.** The aim of the subject is to explain scientific backgrounds of modern biologized technologies of field fodder crop growing in modern market conditions.

**Management of fodder crop quality in technological process.** Subject program provides for growing high quality fodder and they are explained the elements of the technologies by means of which it is possible to manage the quality of fodder phytomass.

**Methods and organization of research in fodder production.** Subject program provides for explanation of ecological and economical principles of field crop distribution, use, origin, capacity and production volumes of crops. They are given modern methods and techniques of researches in intensive fodder production.

### **Master program “Quality of crop production depending on factors of postharvest handling, storage and processing”**

**Processing of crop products.** This discipline teaches methods of processing of basic raw materials for human food – grains, flour, cereals and others. Agricultural mills – the basics to get flour, which provide raw materials bakeries that are located in rural areas. Discipline teaches technology training and grain production of different grades of flour. Teaches techniques of preparation of grain groats purpose – peas, barley, millet, buckwheat - to get on the rural lines (Shellers) grains, providing high output and quality. Discipline teaches methods of obtaining starch from potato tubers, a technology tinned vegetables. Provides knowledge of the efficient technologies preserving perishable vegetables (tomatoes, cucumbers, peppers) and fruits and berries products than ensuring the efficiency of their production (growing).

**Commodity of raw materials and processed plant products.** Discipline teaches ways of achieving the maximum efficiency and raw materials and processed products (flour, cereals, fresh and preserved). Teaches rules contracts with processing companies (factories, workshops) for implementation materials. Teaches rules of contracts with enterprises and trade and enforcement of contracts. Teaches methods of evaluation of raw materials and finished products: sensory, physical and chemical. Teaches methods and modes of transportation and storage of raw materials and finished products. Teaches rules of payment for the sold raw materials and finished products.

**Technical biochemistry.** Discipline provides knowledge about changes in the biochemical composition of raw materials during processing. Teaches processing technologies aimed at obtaining such finished goods that would maximize the use of man

## MASTER DEGREE PROGRAMS

was suitable to meet its specific needs (finished products, semi-finished products, etc.). Provides expert knowledge about the contents of all mineral rights for substances in raw materials, as well as their content at various stages of processing in order to direct the work of machines for processing at optimum mode that provides the desired quality. Provides knowledge of dynamics of biochemical products crushing, grinding grain, which enable the creation of regimes of hydrothermal handling, aspiration, of scattering and sieve-winnowing machines, get several varieties of flour, a certain number of them out. Discipline provides knowledge of the relationship of output and varieties of cereals biochemical composition of the feedstock. Discipline provides knowledge of the biochemical composition of each type of vegetables, fruits and berries raw materials and the dynamics of the application of the necessary processes, enabling calculation formula, modes of technological processes for canned food with necessary food and biological value.

**Quality management and certification of plant products.** Discipline including study thus questions purpose and task quality management of plant products, basic concepts and categories in the field of quality management, the factors affecting the quality of products, the role of human factors in addressing the quality, competitiveness and product quality, development of quality control and domestic experience in quality management, development of assessment methods quality of products, quality evaluation production, quality management experience in various countries, international standards for quality systems (ISO 9000).

---



**Master Training  
in specialty “AGROCHEMISTRY AND SOIL SCIENCE”  
branch of knowledge “Agriculture and forestry”**

<b>Form of training, licensed number of students:</b>	
– full-time	45
– correspondence	30
<b>Term of study</b>	1,5 years
<b>Credits</b>	90 ECTS
<b>Language of teaching</b>	Ukrainian, English, German
<b>Qualification of graduates</b>	Researcher in agrochemistry and soil science

**The concept of training**

Modern farming requires high-quality, environmentally friendly products with minimal energy and labor costs while maximizing its output that requires large-scale introduction of high-grade, energy- and resource-saving and environmentally appropriate technologies. For the present, which puts high demands to humanity, it is need not just an agronomist but a professional in the field of agrochemistry and soil science, who can make a qualitatively new technological solutions with use of information technologies in technological processes management. In the future, improving of management practices in crop production process is undoubted. These technologies can be realized only by highly skilled professional in “Agrochemistry and soil science”. Specialist of the profession can realize the following areas of professional activity: development of technologies and measures to improve soil quality, soil quality monitoring, prevention of soil degradation, optimizing of biodiversity in soil, implementing of soil conservation technology and agrochemical service on farms, monitoring of production quality with application of fertilizers and plant protection, prediction of agrochemical market and economic efficiency of plant growing.

**Production oriented master program**

***Master program “Agrochemical service of modern technologies in crop production”***

The program aims to build knowledge and skills of the process of production in the crop. It reveals methodological and agronomic aspects of agrochemical service, analytical and practical application of modern control methods of soil fertility, the elements of precision agriculture and energy-efficient technologies, diagnostics, power plants, development of agrochemical cartograms, passports fields, budget and technical documentation.

The basis for the implementation of the master program is research and teaching laboratories and production department.

**Sphere of graduates employment**

Field crop production agricultural industry, farmers, government agencies of soil fertility and crop agrochemical service.

***Master program “Soil Science, monitoring of soil quality and soil protection”***

Establishment and analysis based on field and laboratory studies of physical, water-physical, physical-chemical, biological and agrochemical soil properties, developing measures for their conservation and restoration of fertility. Defining of ecological and

genetic status and potential productivity of soils in relation to particular cultures or groups, as well as other specialized use of soil. Establishing the nature and extent of degradation processes. Measures of rational management and improvement of soil fertility. Studying of disturbed and polluted soils reclamation methods, increasing of potential soil fertility after their pollution, destruction, degradation, and through them landscapes and the biosphere as a whole. Metrological aspects of modern instrumental methods of analysis and characteristics of modern instrumental methods of analysis.

### **Sphere of graduates employment**

Graduates may be employed in the system of regional branches of Scientific-research institute “Ukrzemproekt”, in the system of design and exploration centres for monitoring of soil fertility “Oblderzhrodyuchist”, in any agricultural enterprise in positions of agronomist, agronomist-chemists, in the system of soil conservation service as an engineer-soil-scientist, in the banking sector as experts to assess the soil, the system of quarantine services and customs control of Ukraine in positions related to the assessment of soil quality and ecological state of the environment, in the commercial and government establishments that produce and sell chemicals (fertilizers, pesticides) as a manager, in environmental inspections in the internal affairs, in the field of criminology, Soil Conservation Service System, in Inspection of rational use and protection of land in positions connected to the ecological state of the environment control, assessing soil quality. According to classifier DK-003-2010 Code KP 2213.2 professional title of work – soil scientist.

### **Research oriented master program**

#### ***Master program “Improvement of diagnosis of nitrogen nutrition of agricultural crops and their systems of their fertilization”***

The program is aimed to create skills of scientific research in a future specialist, ability to deliver and implement agrochemical field and laboratory studies. It accentuated the methodology, methods of diagnosis of plant nutrition, including nitrogen, to agrophytocenoses rational organization as a system. Installation, according to the phenological observations and analytical work, mathematical relationships between a power plant and indicators of future crops.

The basis for the implementation of the master program is research and teaching laboratories and production department.

### **Sphere of graduates employment**

Scientific, research, advisory, on the regulation of the production process, power plants, the use of fertilizers and chemicals, management of soil fertility.

#### ***Master program “Soil protection and quality increasing through the use of local resources and minimization of tillage”***

Anthropogenic effects on soil fertility and land quality, assessment of the effectiveness of different agro ecological farming systems and the development of resource-saving technologies of crop growing on the base of integrated use of different kinds of organic fertilizers and minimizing of soil tillage. Preparation and use of local fertilizers, ensuring non-deficit balance of humus and nutrients. Justification of measures for the protection and restoration of soil fertility. Quality of soil and land quality assessment based on indicators of environmental conditions of soil. Methods development of creating and use of land quality cartograms.

---

### **Sphere of graduates employment**

Graduates may work in research institutions in positions of researchers, in the system of regional branches of scientific-research institute “Ukrzempromekt” in the system of design and exploration centres “Oblderzhrodyuchist”, in the System Soil Conservation Service as an engineer-soil-scientist, in soil conservation service, in Inspection of rational use and protection of land in positions of control the ecological state of the environment, assessing soil quality, in any agricultural enterprise in positions agronomist, agronomist-chemists. According to classifier DK-003-2010 Code KP 2213.1 professional title of work – Researcher in Agricultural Chemistry and Soil Science.

### **Master program of applied biology specialization “Laboratory work” for expert control sphere of employment**

#### ***Master program “Methods for genetic control of plant”***

The master's program provides theoretical and practical study of modern methods of diagnosis and biological control of biological objects – seeds, breeding material, and other products, equipment principles molecular genetic laboratories, the organization of work in the lab, basic concepts in the field of metrology, standardization and certification principles kinetic, biochemical, biological methods, current approaches create genetically modified organisms, especially their comprehensive diagnosis in raw materials and in consumer products, molecular markers, their types and methods of application.

### **Sphere of graduates employment**

Admission to PhD program of NULES of Ukraine and other higher educational establishments, employment in advanced agricultural industrial enterprises, scientific-research establishments of NAAS of Ukraine. Agricultural enterprises of different ownership, regional and district administration, advanced farms, companies, holdings and corporations, scientific-research establishments of NAAS of Ukraine.

### **Practical training**

Students receive practical training in research farms of NULES of Ukraine: separated subdivisions “Agronomic Research Station” and “Velykosnytinske Education and Research Farm named after O. Muzychenko”, at research institutions of Academy of Agricultural Sciences and Academy of Sciences of Ukraine, National Centre of soil fertility conservation, the State Committee for Land Resources, educational and scientific laboratories of NULES of Ukraine.

### **Proposed Topics for Master Theses**

1. Agrochemical estimation of various methods of corn plant nutrition diagnosing on meadow-black soil calcareous.
  2. Productivity of winter wheat under long-time application of fertilizers on meadow-black soil of Forest-Steppe zone of Ukraine.
  3. The effect of fertilizers application under sugar beets in different parts of crop rotation on meadow-black soil calcareous soil.
  4. Simulation of winter wheat productivity with ultra disperse systems of biogenic micronutrients using.
  5. Management of soybean productivity under resource-saving technology of crop growing.
  6. Fertility reproduction in black soil typical in field and vegetable crop rotation.
  7. Change in water-physical and physical-chemical properties of black soil typical under minimization of tillage and biologization of farming.
  8. Assessment of fertility of various quality Anthrosols under their agricultural use.
-

**MASTER DEGREE PROGRAMS**

9. Effect of soil conservation technology on soil microaggregative and structural aggregate composition of black soil typical.

10. Effect of tillage and fertilization in short crop rotations on parameters of physical properties of black soil typical of Right-Bank Forest Steppe.

**Academic rights of applicants for a master program**

In addition to the specialty “Agrochemistry and Soil Science” Applicants with a bachelor's degree in the direction of “Agronomy” can continue studying in the field of knowledge **“Agriculture and Forestry”**:

- 8.09010101 – Agronomy (see p. 19);
- 8.09010104 – Fruit and Vegetable Science and Viticulture (see p. 51);
- 8.09010105 – Selection and Genetics of Agricultural Crops (see p. 65).

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality management, standardization and certification”, Master’s program “Quality management of plant production, water, soil and pesticides” (see p. 176);
- 8.18010021 – “Pedagogy of Higher School”, Master’s program “Methodical of science of circles disciplines in plant and processing’s productions” (see p. 434);
- 8.18010018 – “Administrative managements”, Master’s program “Management of horticultural, vegetables and greenhouses markets” (see p 3977);
- 8.18010020 – “Management of educational institutes” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Agrochemistry and soil science”**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Labor protection in industry	1	72	1,3	2,0
2	Business foreign language	1	72	1,3	2,0
3	Philosophy of science and innovative development	1	108	2,0	3,0
4	Geographic information systems of agricultural landscape and basics of geostatistics	2	72	1,3	2,0
<i>Total number</i>			324	6,0	9,0
<i>1.2. The cycle of professional and practical training*</i>					
1	Management of soil regimes	1	108	2,0	3,0
2	Soil conservation and restoration of fertility	1, 2	216	4,0	6,0
3	Soil quality, standardization and product certification	1	180	3,3	5,0
4	Management of nutritive conditions of crops in drop irrigation in greenhouses	1	144	2,7	4,0
5	Agrochemical service	2, 3	144	2,7	4,0
6	Management by crop production quality	2	108	2,0	3,0
7	Environmental chemistry	3	72	1,3	2,0
8	Technologies of rational land use	2	144	2,7	4,0
9	The strategies of agrocenosys management	1	144	2,7	4,0
<i>Total number</i>			1260	23,3	35,0
<i>Total according to regulatory part</i>			1584	29,3	44,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					

**MASTER DEGREE PROGRAMS**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<i>2.2.1. Cycle of professional and practical training *</i>					
1	Programming of soil fertility and crop production	3	216	4,0	6,0
2	Methodology of scientific researches	2	180	3,3	5,0
3	The models of the technological management in agrochemical service	2	216	4,0	6,0
4	Land reclamation	2	216	4,0	6,0
<i>Total amount according the University chose</i>			<i>828</i>	<i>15,3</i>	<i>23,0</i>
<i>2.2. Disciplines chosen by students</i>					
<i>2.2.1. Cycle of professional and practical training *</i>					
Production oriented disciplines					
Master program "Soil Science, monitoring of soil quality and soil conservation"					
1	Research methods of soil cover	3	72	1,3	2,0
2	Quality of soils (bonity of soils)	3	72	1,3	2,0
3	Soil quality monitoring	3	72	1,3	2,0
<i>Total selected by the students</i>			<i>216</i>	<i>3,9</i>	<i>6,0</i>
Master program "Agrochemical service modern technologies in crop productivity"					
1	Economic and organizational support of agrochemical service	3	72	1,3	2,0
2	Diagnosis of plants nutrition and fertilization strategies	3	72	1,3	2,0
3	Management of agrochemical resources	3	72	1,3	2,0
<i>Total selected by the students</i>			<i>216</i>	<i>3,9</i>	<i>6,0</i>
Master program "Methods for genetic control of plant"					
1	Ecological genetics and special plant genetics	3	72	1,3	2,0
2	Laboratory work	3	72	1,3	2,0
3	Methodology and technical support modern genetic research	3	72	1,3	2,0
<i>Total selected by the students</i>			<i>216</i>	<i>3,9</i>	<i>6,0</i>
Research oriented disciplines					
Master program "Conservation and Increasing of quality of land through the use of local resources and minimizing of soil tillage"					
1	Diagnostics of soils	3	72	1,3	2,0
2	Soil organic matter	3	72	1,3	2,0
3	International classification of soils and taxonomy	3	72	1,3	2,0
<i>Total chosen by university</i>			<i>216</i>	<i>3,9</i>	<i>6,0</i>
Master program "mproving the diagnosis of nitrogen nutrition of crops and their fertilizer"					
1	Diagnosis plant nutrition	3	72	1,3	2,0
2	Management plants nutrition conditions	3	72	1,3	2,0
3	Management by crop production quality	3	72	1,3	2,0
<i>Total chosen by university</i>			<i>216</i>	<i>3,9</i>	<i>6,0</i>
Total number of elected part			1044	19,3	29,0
Practical training			396	7,3	11,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. Cycle of humanitarian, social and economic training\*

**Labor protection in industry.** It normatively applied discipline, that on the basis of analysis of production and harmful factors, caused production processes in agriculture,

offers the scientifically grounded measures organizational and to the technical plan, to prevent an accident rate, traumatism, professional diseases of workers.

**Business foreign language.** The course is aimed at the communicative and professional foreign language. Practical language skills is an essential organic component of modern training institutions of higher education. Learning a foreign language in non-linguistic institution, pursuing practical goals are inextricably combined with general and educational objectives. Learning a foreign language in high school promotes educational and professional level.

**Philosophy of science and innovative development.** The course is highlighting the specifics of philosophy of science as the special type of humanitarian knowledge and as of learning subject. The characteristic of historical development of science and philosophy of science is given. The main problems of general and scientific methodology, structure of cognition process, scientific ethics, scientific world outlook content and development are discussed. The special attention is given to problems of modern science and possible ways of it's interaction with another spheres of society, as well as to problems of biological science and ecology. The course is notable for it's outlooking orientation, which allows to synthesize acquired knowledge in specialized subject and in the humanities, in the integral scientific world perception – the theoretical basis of the magisterial specialists schooling level.

**Geographic information systems of agricultural landscape and basics of geostatistics.** Discipline provides getting theoretical knowledge of basics in geospatial analysis as well as practical skills in the use of spatial analysis and geostatistics for their use in agrochemistry and soil science.

### *1.2.Cycle of professional and practical training \**

**Management of soil regimes.** The main place in the rational and efficient use of natural resources is land use, conservation and improvement of soil fertility. The study and understanding of all the processes taking place in soils is an important condition for the realization of these objectives. Especially useful is the ability to manage processes and groundwater regimes and on this basis to improve soil fertility.

**Soil conservation and restoration of fertility.** The course introduces the current status of soil resources of the world and in Ukraine, methods of investigation of degradation processes in soils, through the rational use. The main objectives of the course is getting the appropriate amount of theoretical and methodological knowledge and practical skills to assess the degradation processes in soils, prediction of mechanical, physical and chemical degradation, development of measures to preserve and restore fertility, rational use of land resources on specific soil and climatic conditions, the formation of skills independently analyze the state of the soil cover.

**Soil quality, standardization and product certification.** In the study of this course students learn terms and definitions, purpose and objectives of standardization and oversee the implementation and application of standards. The course introduces the national standardization system in Ukraine and regulatory framework for standardization in the economy and health of soils. The purpose of discipline is mastering the basic principles of certification of soil and lands according to their specialized use. We consider the current status of land resources in Ukraine and priorities for their reproduction. We give a qualitative assessment of soil and the strategy of their fertilization with regard to scientific approaches. Monitoring soil quality and new usage of the results of monitoring of soil are described in details.

**Management of nutritive conditions of crops in drop irrigation in greenhouses.** The course takes into consideration of the particularities of specialty and the level of the qualification. This subject lets to hold of basic of the management of nutritive conditions of crops in drop irrigation in greenhouses. Future specialists take

knowledge and skills in creation of optimal models for nutritive regimes in greenhouses and may to manage these regimes according to crop needs.

**Agrochemical service.** Modern crop production technologies based on scientific foundations. Formation of crop productivity, management of soil fertility, production and application of fertilizers, etc. - issues that need trained professionals. Agrochemical service as is link between science and farming. The subject taught basics of farming agrochemical provided and service, forms skills to monitor and use of chemicals in crop production processes, preservation and improvement of soil fertility, including natural conditions, the agrochemicals market, specific production. The objective of discipline is to develop a specialist and master the theoretical knowledge and practical skills with guidance and support producers in crop chemicals facilities and services.

**Management by crop production quality.** The course is devoted to the studying of on of the most important topics of modern crop growing – the quality of crop products. The course based on the studying of the main chemical, physical, biological and technological indexes of the quality of cereals, technical crops, oil crops, vegetables and horticultural crops. It is planned to study characteristics of fertilizers application to different crops taking into consideration quality of products.

**Environmental chemistry.** The discipline studies the origin of the life on the Earth, the aspects of the biosphere concept and principles of its function. In the syllabus are shown types of migration, biological cycling i biogeochemical cycles of chemical elements and the role of living matter. It is studied the principles of biogeochemical zoning, endemic diseases of biogeochemical origin. Labtraining includes analytical studies of natural and artifice aobjects (natural water, house hold chemicals, food products, etc.).

**Technologies of rational land use.** The course “Technology rational land use” is intended to help harmonize the relationship between the agricultural domain and the natural environment, develop new approaches and principles of agricultural production on different soil and climatic conditions with minimal energy and material resources to carry out measures of forecasting and planning and efficient use of land, regardless of ownership and management. The main objectives of the course is the acquisition of knowledge and practical skills in management of land resources on specific soil and climatic conditions, the formation of skills independently analyze the state of the land, to evaluate options for optimizing land use patterns, predict the development of degradation processes and to develop measures to prevent and control them, capture the general principles of environmentally sustainable agricultural landscapes.

**The strategies of agrocenosys management.** The subject takes important place between other disciplines in formation specialists in agrichemical field in Ukrainian agricultural sector. The purpose of course is forming specialists with complex ecological point of view to decision questions in agrochemical service in agriculture. It gives skills for future specialists to generalize all knowledge in system “soil-plant-fertilizer” with decreasing of all losses and getting maximal revenue in conditions of present market.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.2.1. Cycle of professional and practical training \*

**Programming of soil fertility and crop production.** Programming of soil fertility and crop production is directed to regulate organization of agrophytocenosis as system with the view of improvement of maximum its productivity. Population provision with crop production will to realize mainly decide to crop capacity increase, by virtue of scientific and technical progress introduction to agriculture and crop grown. Actions complex for to attention of objective point included programming course of soil fertility and crop production. To its base is optimal provided of plant necessity by vital needs recurs. Programming of soil fertility and crop production included improvement of many connective

---

sciences – vegetable physiology, agriculture, crop growing, soil sciences, agrochemical, agrometeorology, agrophysics and mathematics, cybernetics, economics.

**Methodology of scientific researches.** Bases of methodology of scientific researches, advantages of different levels of scientific cognition are planned to study in a course. The stages of preparation and conducting of research work are studied. The course enables the forming of practical skills for raising of problems, to development of hypothesis and determines the ways to creation of scientific theory. The great attention is given to learning the questions of researches on scientific levels and registration of researches results in conformity with instructions.

**The models of the technological management in agrochemical service.** The economic development of the agricultural sector and competitive ability of the agricultural factories depend from technological level and scientific development of the agricultural industry and depend from organizing perfection of technologies of the growing of crops. These all are reflected in actions of agrochemical service. Therefore, the future specialist has to know progressive information in technological agrochemical service for agricultural industry. The discipline such as “The models in the technological management in agrochemical service” has the purpose to build up skills to complex method of approach for resolutions of problems in agrochemical service with using of the theoretical knowledge and practice.

**Land reclamation.** Land Reclamation studies rehabilitation measures of damaged and degraded lands in biogenic status, particularly for use in agriculture, forestry, creating recreation areas, construction and stocking of artificial reservoirs, i.e. the creation of landscapes, harmonized with the natural environment. The purpose of discipline is to explore options and evaluate overburden, grading disturbed land, development of fertility restoration measures.

## *2.2. Disciplines chosen by students*

### *2.2.1..Cycle of professional and practical training \**

#### *Production oriented disciplines*

#### **Master program “Soil Science, monitoring of soil quality and soil conservation”**

**Research methods of soil cover.** In the studying course a methodology and research methods of soils are studied, traditional and new methods. Studying course consist of 2 modules, which include 10 theoretical topics, 20 hours of laboratory-practical themes and individual tasks. It is help students creatively and complex to divide a problem of soil cover investigation

**Quality of soils (bonity of soils).** Quality of soil is a quantitative assessment of their potential productivity. It is the basis for quality and economic value of land and land registry, without which efficient use of land in Ukraine is impossible. The purpose of discipline is to train high quality specialists in soil science, masters in the field of soil and land conservation. Quality of soil is the final discipline in a series of soil science and agronomic sciences.

**Soil quality monitoring.** Monitoring of soil quality is a system of observations, quantify and control the use of soil and land with the purpose of managing their productivity. For diagnostics of soils stage it is important to have knowledge and to be able to interpret these complex informative indicators: changes in the structure of soil, land transformation, assessment rate of change of the basic properties of soils, assessment of erosion intensity, reclamation indicators, evaluation of effective soil fertility. The purpose of this course is to teach methods of assessment soil quality to control and prevention of negative processes of soil formation.



**Master program “Agrochemical service modern technologies in crop productivity”**

**Economic and organizational support of agrochemical service.** The main aim of the discipline for students is to get basic knowledge of economical and managerial ways to run agrochemical service, to be able to analyze and rationally use agrochemical resources on farm, to run agrochemical support and service of agricultural enterprises. After the studying of the discipline students must get skills in monitoring of the use of fertilizers and other agrochemicals during growing of different crops, supporting and increasing the soil fertility, be able to consider climatic and weather conditions when planning system of fertilizers application. Along this abovementioned students must be familiar with fertilizers market, agrochemical service in Ukraine, status of Ukrainian soils and the most up-to-day results of fertilizers use.

**Diagnosis of plants nutrition and fertilization strategies.** The course is devoted to the studying the soil and plant diagnostics as bases of program development of plants nutrition and strategies of fertilizers application. Types of soil and plant diagnostics and methods of their using in the fields and laboratories are widely exposed. The great attention is given to learning the questions of fertilizers assortment, its transporting, storing, term and method applying take into soil-climatic areas, biological features of plants and results of diagnostics.

**Management of agrochemical resources.** The course deals with analyzing and optimum usage of agrochemical resources, agrochemical maintenance and service of agricultural enterprises, the formation of skills for monitoring and usage of chemicals in manufacturing processes of crop production, conservation and improvement of soil fertility, including natural conditions, market of production, the use of agrochemicals and services of the services sector, monitoring of soil with regard to the use of agrochemical resources.

**Master program “Methods for genetic control of plant”**

**Ecological genetics and special plant genetics.** This course of lectures for masters is based on genetic approaches to the study of ecological relationships. This course based on this principle in environmental genetics and genetics discussed in detail special independent research areas such as genetic control of environmental relations and variability characteristics of sensitivity to environmental factors and factors of biological nature. The course provides a historical perspective of the ideas and methods of biological science.

**Laboratory work.** The purpose of teaching – to give students an idea of legal, organizational, technical and methodological aspects of the establishment and functioning of the laboratory of molecular diagnostic analysis of crop production and other laboratories with similar objectives and activities, implementation and operation of the quality management system of laboratories; provide practical skills in applying the principles and methods of formation and functioning of the laboratory, the use of specific methods and approaches for solving control of qualitative and quantitative indicators and signs.

**Methodology and technical support modern genetic research.** The purpose of teaching to give students a thorough understanding of the modern platform of genetic analysis, basic facilities and platforms for primary nucleotide sequence genomes of slice genetic analysis, sophisticated tools for microscopy and molecular imaging processes provide practical skills bioinformatics analysis sequencing and analysis of genomes.

*Research oriented disciplines*

**Master program “Conservation and Increasing of quality of land through the use of local resources and minimizing of soil tillage”**

**Diagnostics of soils.** Diagnostics of soil is the definition of its ecological and genetic status and productiveness, potential and effective. Objective of soil diagnostics is

establishing of classification belonging to a certain type, subtype, genus, kind, variant and lithological series, determination of ecological status and potential quality and efficient productivity of the soil variation. This diagnostics is not possible without taking to the situation of all, without exception, degradations of soil variation, including pollution.

**Soil organic matter.** Soil organic matter is an important part of soil, which includes soil humus, organic humified remains, microbial biomass, and products of living organisms activity. Amount of organic matter and its quality define the main properties of soil, regulate its processes and regimes and determine the level of fertility. Very important is its role as natural accumulator of biochemical energy bound in plant biomass. To characterize the organic matter of the soil the system of parameters of humus stage, biological and enzymatic activity are taken.

**International classification of soils and taxonomy.** The concept of classification, nomenclature and diagnosis of soil. Classification problem in soil science. Principles, objectives and importance of soil classification. Geographic-genetic, factor-genetic and genetic principles of soil classification. Western European and U.S. soil classification systems, international system WRB for soil resources. Reflection of soil varieties in soil classification systems. Taxonomic units of genetic soil classification. Principles of soil taxonomy: type, subtype, genus, kind, variant and lithological series. Characteristics of genetic soil type. Features selection of other taxonomic units in the genetic classification of the soil type. The system of taxonomic units WRB, German, English and American classifications. The essence of the study nomenclatures soils. Climatic, hydrological and biological proving of soil diagnostics. Morphological and genetic, chemical and other diagnostic indicators of soil. Diagnosing soils in the field at mapping.

#### **Master program “Improving the diagnosis of nitrogen nutrition of crops and their fertilizer”**

**Diagnosis plant nutrition.** The place and role of soil diagnostic and of plant diagnostic and of other types of diagnostic in the valuation plant nutrition are planned to study in the course. The methods of soil and plant diagnostic are looked into. The great attention is given to learning of operative methods of soil diagnostic and of plant diagnostic during plants vegetation. The strategic diagnostic is looked into the questions of the influence of fertilizers application and the effect of plant protection application on changes in chemical and agroecologic conditions of soil and plants. The diagnostic of yield and diagnostic of yield quality are studied in field of usefulness to produce of ecologic clean products.

**Management plants nutrition conditions.** Management plants nutrition conditions is an effective way to control the crops productivity. Agrochemical service today is impossible without knowledge of the theory of plant nutrition, absorption mechanisms batteries, photosynthesis, water and gas exchange in plants. It is important to know the role of solar radiation, heat and water regimes, soil solution as factors of plant growth. Discipline is designed to generate knowledge and skills to create optimal models the power on and manage according to the biological requirements of culture.

**Management by crop production quality.** The course is devoted to the studying of on of the most important topics of modern crop growing – the quality of crop products. The course based on the studying of the main chemical, physical, biological and technological indexes of the quality of cereals, technical crops, oil crops, vegetables and horticultural crops. It is planned to study characteristics of fertilizers application to different crops taking into consideration quality of products.

**Master Training  
in specialty “FRUIT AND VEGETABLE SCIENCE AND VITICULTURE”  
branch of knowledge “Agriculture and forestry”**

<b>Form of training, licensed number of students:</b>	
– full-time	45
– correspondence	30
<b>Term of study</b>	1,5 years
<b>Credits</b>	90 ECTS
<b>Language of teaching</b>	Ukrainian, English, German
<b>Qualification of graduates</b>	Horticulture and viticulture researcher

**The concept of training**

Training of master's degree students in specialty is oriented at modern and perspective directions of development in fruit and vegetable growing and viticulture. Training master degree students on specialty foresees the deep specialized training in the sphere of fruit-growing, vegetable-growing of the opened and protected soil. Such specialists, after acquiring special abilities and knowledge of innovative character in this sphere are able to satisfy modern requirements of the society in assortment and production of necessary amount of high-quality fruit and vegetable products for internal consumption and to the export, capable to organize and to ensure use of the most progressive modern technologies, both in scientific researches and production.

A graduate in this specialty theoretically and practically trained, has knowledge's and skills of modern technologies in the field of horticulture and viticulture.

**Production oriented master program**

**Master program “Vegetables growing”**

Vegetable growing is an important branch of agriculture in Ukraine. Currently, more than 100 species of cultivated plants to produce as the vegetables. Now is developing new farm specialization - organic production, for export, for different types of processing and so on. The basis of all technologies is growing variety and heterosis hybrid. The problem of creating new varieties are very important for different technologies is very important. The prospect planning of the vegetable growing is impossible without programming and forecasting of the yielding and quality. The particular attention is given to post-harvest technology preparation the vegetables for marketing. Master's program involves the study of three subject matters – “Breeding varieties and heterosis hybrids of vegetables”, “Programming and forecasting crop of vegetable” and “Postharvest preparation of vegetables”. The comprehensive study and development of practical skills will enable future specialists actively to develop modern technology of vegetable production.

**Sphere of graduates employment**

Agricultural enterprises, farms.

**Master program “Horticulture”**

There is foreseen in this master's degree program that students are to be fulfilled the scientific and practical works on different problems of a horticultural branch. The theme of master's degree works may be chosen within such cycle of tasks: modern technologies of the new garden installation, looking after plantation during the vegetation period, ways of growing the planting material, selection of cultivars with useful properties, investigations

---

of cultivar resistance to unfavorable changes of environmental conditions and harmful organisms, prognosis and programming of yield for fruit cultures, methods of computer processing the results of investigations.

**Sphere of graduates employment**

Agricultural enterprises, farms.

**Master program “Protected cultivation”**

Studying of crops cultivation technology for a different greenhouse types. Kind of hydroponic methods plants cultivation and principles of its functioning. The main illness and pests in greenhouses and complex of operations anticipating emergence. Specific methods of selection and seed-growing of vegetables culture for protected cultivation.

**Sphere of graduates employment**

Greenhouses, structures delivering the equipment and materials for greenhouses, scientific organization.

**Master program “Mushrooms’ cultivation”**

Principles of working and organization of mushrooms’ cultivation complexes. Medical macromycetes, its using and meaning. Mushrooms cultivation technologies in naturally conditions. The main illness and pests of mushrooms and operations list for anticipating emergence.

**Sphere of graduates employment**

Complexes of edible mushroom growing, structures delivering the equipment and materials for mushroom complexes.

**Research oriented master program**

**Master program “Scientific research and innovation work of vegetable growing”**

The modern horticulture is characterized by constant renovation of production technologies. At present, horticulture separated in a original direction of the agricultural science. It has its own methodology, methods and techniques for the exploration and development of which requires scientific personnel qualifications. The scientific work requires special knowledge of planning and research. An innovative work has been the basis for the gradual development of vegetable. The starting material for the development of technology is the variety and its seed. The particular attention is given to new directions of scientific work on technologies of organic production. Master's program involves the study of three subject matters – “Scientific research and innovation work of vegetable-growing in open field”, “Approbation varieties and heterosis hybrids of vegetables” and “Organic growing”. The comprehensive study and development of practical skills in innovation work will enable future specialists actively to create and implement the new modern technology of vegetable production.

**Sphere of graduates employment**

Scientific-experimental establishments, agrarian educational establishments

**Master program “Scientific and innovation activity in horticulture”**

The obligatory condition of the program is an installation of innovative experiments for creating the cultivar-specific technologies of growing the garden crops, for determining the efficiency of new preparations including plant growth regulators, complex fertilizers, microelements and microorganisms – both in field conditions and in film-coated

---

greenhouses. There is foreseen in this program the fulfilling phytometrical, morphological and physiological investigations. An innovatory method in the program is educating an ability to analyze and generalize the experimental results, to suggest the scientific hypotheses. Students are to be participated in preparing of scientific publications, to speak on conferences, to accomplish the master's degree works and print author's abstracts. Students-investigators fulfill their works in the laboratories of National University of Life and Environmental Sciences of Ukraine, or in other scientific organizations (in Ukraine or abroad), as well in private garden farms.

### **Sphere of graduates employment**

Scientific-experimental establishments, agrarian educational establishments

### **Master program “Standardized technology storage and processing of fruits and vegetables”**

Program gives knowledge to future professionals for the Unification of certain processes storage through the use of standardization. Standardization of storage technologies on the one hand require standardized technologies vegetable fruits (some sort of corresponding size, biochemical composition, degree of ripeness are the others), the second use of standardized packaging process handling (sorting, sizing) modes of storage. Combining both sides provides receipt, storage exit after standard products with minimum losses.

Discipline teaches students basic standardized technologies, processes used to produce certain types of canned products, which are distributed in canning enterprises in rural areas. Knowledge of standardized storage and processing technologies should send experts to grow suitable (standard) vegetables, fruits and berries products.

### **Sphere of graduates employment**

Growing, organization of collection, handling, product evaluation, storage and processing of vegetables and fruits and berries products.

### **Master program of applied biology specialization “Laboratory work”for expert control sector of employment**

#### **Master program “Methods for genetic control of plant”**

The master's program provides theoretical and practical study of modern methods of diagnosis and biological control of biological objects – seeds, breeding material, and other products, equipment principles molecular genetic laboratories, the organization of work in the lab, basic concepts in the field of metrology, standardization and certification principles kinetic, biochemical, biological methods, current approaches create genetically modified organisms, especially their comprehensive diagnosis in raw materials and in consumer products, molecular markers, their types and methods of application.

### **Sphere of graduates employment**

Admission to PhD program of NULES of Ukraine and other higher educational establishments, employment in advanced agricultural industrial enterprises, scientific-research establishments of NAAS of Ukraine. Agricultural enterprises of different ownership, regional and district administration, advanced farms, companies, holdings and corporations, scientific-research establishments of NAAS of Ukraine.

### **Practical training**

Students receive practical training in educational and research farmstead of NULES: SD of NULES “Agronomy Research Station”, “Velika Snitinka Training and

---

Research farmstead named after O.V. Muzychenko” and “Training and Research farmstead “Vorzel”, as well as in leading agricultural enterprises of different ownership, educational-scientific-industrial laboratory of NULESU “Test new varieties of plants and environmental assessment technologies of fruit, vegetables, medicinal and floral and ornamental crops”, research institutions of NAAS and NAS of Ukraine and state pomology-ampelografical inspections.

### Proposed Topics for Master Theses

1. The peculiarity of seedlings planting of new sweet cherry varieties on seed and clonal rootstocks.
2. Economic and biological characteristics of immune varieties on average height rootstocks.
3. Development of the method of accelerated propagation of black currants varieties.
4. The peculiarity of generative and vegetative propagation of promising varieties of hazelnut.
5. The optimization of the plant density of the late cabbage varieties for the conditions of Kyiv region.
6. The selection of the optimal density non-woven materials to obtain the early production of the bunch carrots.
7. The effect of the plant growth regulators on the fruit quality and earliness Butternut pumpkin.
8. Peppers’ breeding for greenhouses.
9. Improving of half-determine tomato formation methods in winter greenhouses.
10. Cultural-morphological characteristics of fungus species of “Basidiomycetes” class.

### Academic rights of applicants for a master program

In addition to the specialty “Fruit and vegetable growing and viticulture” applicants with a bachelor's degree in the direction of “Agriculture” can continue studying in the direction of knowledge **“Agriculture and Forestry”**:

- 8.09010101 – Agronomy (see p. 19);
- 8.09010105 – Selection and Genetics of Agricultural Crops (see p. 65).
- 8.09010102 – Agricultural Chemistry and Soil Science (see p. 41);

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality management, standardization and certification”, Master’s program “Quality management of plant production, water, soil and pesticides” (see p. 176);
- 8.18010021 – “Pedagogy of Higher School”, Master’s program “Methodical of science of circles disciplines in plant and processing’s productions” (see p. 434);
- 8.18010018 – “Administrative managements”, Master’s program “Management of horticultural, vegetables and greenhouses markets” (see p 3977);
- 8.18010020 – “Management of educational institutes” (see p. 427).

### Curriculum for specialist training of the educational and qualification level “Master” in specialty “Fruit and Vegetable Science and Viticulture”

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	108	2,0	3,0
2	Philosophy of science and innovative development	1	108	2,0	3,0
<i>Total number</i>			216	4,0	6,0
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Methods of research in horticulture	1	144	2,7	4,0
2	Technology in gardening, horticulture and viticulture	1	72	1,3	2,0
<i>Total number</i>			216	4,0	6,0
<i>1.3. Cycle of professional and practical training *</i>					
1	Biotechnology	2	108	2,0	3,0
2	Certification and quality control in horticulture	1	144	2,7	4,0
3	Biochemistry of fruits, vegetables and grapes	2	144	2,7	4,0
4	World agricultural technologies in horticulture and viticulture	1	216	4,0	6,0
5	Organic production of green-stuffs	1	108	2,0	3,0
6	Varieties' study of the vegetable crops	2	144	2,7	4,0
7	Labor protection in industry	2	72	1,3	2,0
<i>Total number</i>			936	17,3	26,0
<i>Total according to regulatory part</i>			1368	25,3	38,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional and practical training *</i>					
1	Greenhouses	2	198	3,7	5,5
2	Flower-growing in protected cultivation	2	180	3,3	5,0
3	Mushrooms growing	2	180	3,3	5,0
4	Partial varieties study of fruit plants	2	198	3,7	5,5
<i>Total amount according the University chose</i>			756	14,1	21,0
<i>2.2. Disciplines chosen by students</i>					
<i>2.2.1. Cycle of professional and practical training *</i>					
<i>Production oriented disciplines</i>					
Master program "Vegetables growing"					
1	Breeding varieties and heterosis hybrids	3	216	4,0	6,0
2	Forecasting and programming crop of vegetable	3	126	2,3	3,5
3	Postharvest preparation of vegetables	3	198	3,7	5,5
<i>Total selected by the students</i>			540	10,0	15,0
Master program "Horticulture"					
1	Modern technologies in horticulture	3	180	3,3	5,0
2	Advanced technologies in the nursery	3	180	3,3	5,0
3	Forecasting and programming harvest fruit crops	3	180	3,3	5,0
<i>Total selected by the students</i>			540	10,0	15,0
Master program "Protected cultivation"					
1	Selection and seed-growing of vegetables in greenhouses	3	216	4,0	6,0
2	Hydroponics	3	216	4,0	6,0
3	Integration plant protection in greenhouses	3	108	2,0	3,0
<i>Total selected by the students</i>			540	10,0	15,0
Master program "Mushrooms' cultivation"					
1	Intensive mushrooms' growing	3	216	4,0	6,0
2	Extensive mushrooms' growing	3	180	3,3	5,0
3	Pest management of mushrooms' growing	3	144	2,7	4,0
<i>Total selected by the students</i>			540	10,0	15,0
Master program "Methods for genetic control of plant"					
1	Ecological genetics and plant special genetics	3	90	1,7	2,5
2	Laboratory work	3	108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
3	Methodology and technical support modern genetic research	3	90	1,7	2,5
4	Molecular Diagnostics in crop production and environmental management	3	72	1,3	2,0
5	Systems analysis as objects of the environment and plant production	3	90	1,7	2,5
6	Transgenic technology, DNA technology of plant	3	90	1,7	2,5
<i>Total selected by the students</i>			<i>540</i>	<i>10,0</i>	<i>15,0</i>
<i>Research oriented disciplines</i>					
Master program "Scientific and innovation activity in horticulture"					
1	Research and innovation in horticulture	3	180	3,3	5,0
2	Subtropical culture	3	180	3,3	5,0
3	Forecasting and programming harvest fruit crops	3	180	3,3	5,0
<i>Total selected by the students</i>			<i>540</i>	<i>10,0</i>	<i>15,0</i>
Master program "Scientific research and innovation work of vegetable growing"					
1	Approbation of vegetables and melons crops	3	216	4,0	6,0
2	Organic vegetable	3	198	3,7	5,5
3	Scientific research and innovation work of vegetable-growing in open field	3	126	2,3	3,5
<i>Total selected by the students</i>			<i>540</i>	<i>10,0</i>	<i>15,0</i>
Master program "Standardized technology storage and processing of fruits and vegetables"					
1	Post harvest handling storage and transportation of vegetables	3	180	3,3	5,0
2	Technology of processing vegetables	3	180	3,3	5,0
3	Standardization, certification and commodity processed vegetable products	3	180	3,3	5,0
<i>Total selected by the students</i>			<i>540</i>	<i>10,0</i>	<i>15,0</i>
Total number of elected part			1296	24,0	36,0
Practical training			360	6,7	10,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. Cycle of humanitarian, social and economic training\*

**Business foreign language.** The course is aimed at the communicative and professional foreign language. Practical language skills is an essential organic component of modern training institutions of higher education. Learning a foreign language in non-linguistic institution, pursuing practical goals are inextricably combined with general and educational objectives. Learning a foreign language in high school promotes educational and professional level.

**Philosophy of science and innovative development.** The course is highlighting the specifics of philosophy of science as the special type of humanitarian knowledge and as of learning subject. The characteristic of historical development of science and philosophy of science is given. The main problems of general and scientific methodology, structure of cognition process, scientific ethics, scientific world outlook content and development are discussed. The special attention is given to problems of modern science and possible ways of it's interaction with another spheres of society, as well as to problems of biological science and ecology. The course is notable for it's outlooking orientation, which allows to synthesize acquired knowledge in specialized subject and in the



humanities, in the integral scientific world perception – the theoretical basis of the magisterial specialists schooling level.

*1.2. Cycle of natural science (fundamental) training\**

**Methods of research in horticulture.** Teaching discipline is to teach students the planning and management of research with fruit, vegetables, grapes and technology in the storage and processing of horticultural products using modern information technology.

**Technology in gardening, horticulture and viticulture.** The course introduces students to the concept of information technology, information systems, their value, basic components, the methods and technologies of information technology in gardening and horticulture. During laboratory acquired modern program for processing different types of i, and applications to analyze data related to vegetable gardening. Most of the course is devoted to the study of the most common information technologies that allow agronomy specialist in professional and academic solve problems, analyze results and make the right decision.

*1.3. Cycle of professional and practical training \**

**Biotechnology.** Discipline focuses on cultivation of isolated cells and tissues, callus and suspension cultures, microclonal propagation of plants and their recovery from viral infections, morphogenesis and regeneration of plants in vitro (organogenesis, embryogenesis, rhizogenesis), culture of isolated protoplasts as a basic of cell engineering, selection of plants in vitro, cell and genetic engineering, methods for transgenic plants obtaining.

**Certification and quality control in horticulture.** Discipline including study thus questions: general information about world certification development, basic terms and definitions in the field of certification kinds and system certification, the main provisions of state certification system, the order of the work product certification, certification of fruits and vegetables.

**Biochemistry of fruits, vegetables and grapes.** The study extends the knowledge of experts about food and biological value of each group of vegetables cabbage, root crop, onion. Discipline gives knowledge about the properties of all substances – proteins, fats, carbohydrates, major minerals, vitamins – and their dynamics depending on factors cultivation, the dynamics of biochemical composition during ripening, storing basic types of vegetables. Knowledge of the biochemical composition of each vegetable, each part of their harvest (leaves and roots) in different periods of the growing season (beam or mature products) enables qualified to advertise every consignment during its implementation and logistics processes to direct the path of getting the highest profitability of vegetable production, horticulture, berry. Discipline gives knowledge about the dependence of processing technologies on biochemical composition of vegetables and fruits and berries raw.

**World agricultural technologies in horticulture and viticulture.** The lecture course of the discipline consist 45 hours. It highlights issues newest technologies of growing vegetable crops, especially soil preparation and fertilization, cultivation of seedlings for open ground, general care measures for plants and harvesting. When considering international technology highlights growing technology such crops: cabbage, carrots, beets dining, onion, tomato, pepper, eggplant, cucumber, watermelon, lettuce, sweet corn, asparagus. On laboratory-practical lessons have been studied the productivity of vegetable crops in specific climatic conditions by using the manure, fertilizers, green manures. Rational selection varieties and hybrids of vegetable crops for sowing. Selection of equipment for a specific field work. Selection of highly efficient tank mixtures, fertilizers and identify opportunities for and the amount of irrigation.

**Organic production of green-stuffs.** The situation on world food markets shows the increasing consumer interest in healthy nutrition and with the direct contribution to the

preservation of the natural environment. Therefore, meet the growing demand for organic products continues to be one of the strategic directions of development of agriculture. In a course from the study of discipline the questions light up from the study of bases of receipt ecologically of safe food, maintainance of fertility of soil and protecting stuffs from contamination. Organic agriculture – the production system that supports the health of soils, ecosystems and people. It depends on ecological processes, biological diversity and natural cycles that are specific to local conditions, while don't use of resources that cause adverse effects. Organic agriculture combines tradition, innovation and science to improve the environment and promote fair relationships and adequate standard of living for this understanding.

**Varieties' study of the vegetable crops.** This discipline devoted to Varieties' study of the vegetable crops and consists of three modules. In it's given origin, history of cultivating and inner species categorizations of (subspecies's, varieties, and varieties type) vegetable and melons-field crops for group. The variety is the main object on which is directed cultivation technology. It was showed the analysis of the varieties resources' condition in Ukraine and their role in the production of agricultural output. Deeply motivated selection varieties and hybrids for determined of growing technology of vegetable crops and different directions of vegetable growing. On practically-laboratory lessons are studied certain varieties and hybrids of the vegetable and melons-field crops' of their different types of sort. They are study systems of approbations and identification sign, particularities of the expert operation of varieties on VOS – a test of vegetable and melons varieties. Lessons are conducted on the training-experimental areas and in laboratory condition using fresh examples. The pictures, slides, presentation, albums and catalogues are used.

**Labor protection in industry.** It normatively applied discipline, that on the basis of analysis of production and harmful factors, caused production processes in agriculture, offers the scientifically grounded measures organizational and to the takhnichnogo plan, to prevent an accident rate, traumatism, professional diseases of workers.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professional and practical training \*

**Greenhouses.** The new types construction of greenhouses are represented. The curs consist of many information about microclimat control gadgetries and principles its links in different conditions. As a result of it students can choose construction for greenhouse building and plane modernization process.

**Flower-growing in protected cultivation.** In this course are studied the growing of cutting (rose, gerbera, carnation, chrysanthemum), bulbs and onions, some additional flowers (orchid, alstroemeria, strelitsia e.t.c) in greenhouses. Intensiveness and extensive culture, their capacities meriste culture for each flowers.

**Mushrooms growing.** The program is devoted to study the biological capacities cultivated mushrooms, confided to the climates. The constrictive characteristics mushrooms greenhouses and principles its mechanizations for optimum microclimates factors have been analyzed. The technologies to the received mushroom's mycelium, substrates preparation and mushroom bodies different kinds strains are looked.

**Partial varieties study of fruit plants.** Course studying the biology of non-traditional varieties, market opportunities varieties. Supporting screening at growing in plantations, selection of varieties and hybrid forms for use in breeding. Features of varieties suitable for laying compacted planting, raw gardens. The study of this course will enable future graduates, researchers correctly evaluate alternative varieties and adopt best for mass propagation in nurseries and growing in plantations. Maintain and improve their grades by using clonally selection, targeted use of their products. Identify varieties

---

donor and source of valuable traits for use in the selection process. Know the basics of genetic collections varietal resources and be able to use them in the performance of breeding programs. Master the technique of monitoring market fruits and berries.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training \**

*Production oriented disciplines*

**Master program “Vegetables growing”**

**Breeding varieties and heterosis hybrids.** The main object which is directed cultivation technology is the variety and heterosis hybrid. This discipline devoted to breeding varieties and heterosis hybrids and consists of two major modules. The first of them is dedicated to breeding varieties and other is dedicated to selection heterotic hybrids of vegetable crops. The first module is presented by basis of modeling of varieties and breeding methods, the doctrine of initial material and signs, population structure, extension methods variability characteristics, intraspecific and interspecific hybridization, mutagenesis, polyploidy and modern methods of biotechnology (transhenoz, somatic hybridization, etc.). The special attention is given to methods of selection for adaptability (heat resistance, cold resistance, drought tolerance, etc). The first part contains modern methods of breeding and seed production, including the modeling techniques, for example, cabbage, carrots, table beet, parsley, celery, radishes, onions, tomatoes, peppers, eggplant, cucumber, etc. The second module is devoted to breeding heterosis hybrids of vegetable crops. Much attention is given to the study of the genetic and physiological nature of heterosis, combining ability evaluation, creating lines with different types of sterility. The morphological characteristic of varieties vegetables hybrids and its classification studies on laboratory-practical lessons are given and masters acquainted with the methods of the study population structure, creating a new source material, model selection process, do crossing scheme and calculate indices combining ability.

**Forecasting and programming crop of vegetable.** The main purpose of vegetable grown is the yield and quality of vegetable production. Programming productivity and production planning are essential for the farmer. This training course takes for the student contemporary methods of programming and forecasting yields of vegetable crops. The system “vegetable crop-soil-weather-climate-crop capacity” takes the central position in the course. Main purpose of subject consists in forming of master’s competence in programming of certain crop capacity level. Lecture course contains 9 topics that reveal new approaches to this problem and target master on own work with literature and methods of cultivation of vegetable crops. Lectures are supplemented by interesting practical work in the laboratory and in the field. In laboratory studies masters programmed set yields from photosynthetic active radiation, hydrothermal regime, soil chemical composition, dozes of chemicals applied and technological hardware. The masters protect coursework in programming productivity of vegetable crops to certain conditions of the natural climate zone, where they do the research.

**Postharvest preparation of vegetables.** The Ukrainian systems for marketing fresh vegetables under present-day conditions are complex, fragmented and dynamic. Demands for high-quality produce are continuing to increase now. In schemes supply of vegetables from field to table is of great importance of postharvest technologies. In the discipline are elucidated the questions of the biological bases of vegetable crops, that affect the quality, its criteria and components. The great importance are the methods of determining quality. The factors that influence on the quality are varieties, timing and method of harvesting, post-harvest technological methods of preparation. The definition of terms ripening vegetables. The biochemical changes during ripening and postharvest preparing vegetables. Technology of harvesting, post-harvest crop preparation to

---

implementation on different kinds of vegetables – cabbage, carrots, beets table, parsley, celery, onion, tomatoes, bell pepper, eggplant, cucumber etc. Stages of harvest and post harvest handling of his – sorting, washing, cooling, storage, logistics and marketing. Standards requirements of post-harvest technology and vegetables.

### **Master program “Horticulture”**

**Modern technologies in horticulture.** Discipline studying modern intensive profitable competitive technology gardening products, namely pome fruit, stone fruit, berry and less common fruit crops as an example of scientific institutions of Ukraine and gardening best foreign technologies. Because the study subject "Modern technologies in horticulture" the student must Know: state and prospects of development of the world of gardening, modern technology of growing high yields of organic fruit and berry crops in different soil-climatic zones, ways and means of improving product quality and measures for its maintenance, ways to reduce labor costs and the means of production in the process of growing; able: design fruit and berry plantations for various forms of agricultural management, design, develop and implement advanced technologies of cultivation of fruit and berry crops; perform biological monitoring of plantations and manage processes yield formation, to develop and implement measures to improve the quality and reduce the loss of fruit production , calculate and provide a highly cost-effective introduction of technology and environmental friendliness.

**Advanced technologies in the nursery.** Course of study investigates modern intensive profitable technologies of plant material production on the example of the achievements of scientific gardening institutions of Ukraine and best foreign technologies. Base of course is studding of sertificated virus free and virus tested plant material production system. intensive technologies of sidling an vegetative rootstocks growing, modern technologies of granule, stone fruits, nuts and berry plant material production. Working program includes problems of plant material standardizing and modern storing technologies.

**Forecasting and programming harvest fruit crops.** As a result of studying this course, students should know the essence, principles and stages of programming, through the rational use of controlled and uncontrolled factors of the crop. To determine the level and factors yield. Predict and program yields fruit and berry crops by computer software. Calculate the potential for a specific site, climatic, really and production levels may yield fruits and berries major crops and to identify factors limiting crop. Identify different methods based on the optimal use of natural and economic resources estimated yield.

### **Master program “Protected cultivation”**

**Selection and seed-growing of vegetables in greenhouses.** Studying of the vegetables selection and seed-growing in greenhouses. Selection process, selection methods. Characteristic of new hybrids. Main methods and technologies growing hybrid seeds of vegetables. Modern technologies with using some types of man's sterility and marker signs have been demonstrated. There are specific hybridization processes for hybrid seeds production.

**Hydroponics.** The methods of the plant growing without soil. Substrates, nutrient solutions, technics are subscribed. Especially grodan (roockwool) culture, RHP-standards. The requirements of the products are such that it complies with the demands and questions from the professional grower.

**Integration plant protection in greenhouses.** The new methods and plants protection technologies for greenhouses are represented. The course consist of big volume of information about specific pests and illness in different greenhouse type. Development system control can be based on entomofag and biometods using. As a result, plants forms more generative organs and its harvest is higher.

---

### **Master program “Mushrooms’ cultivation”**

**Intensive mushrooms’ growing.** The programmer are studied the history of mushroom’s Cultivated for the intensive technology, statement of this subject in Ukraine and World. According to it are described the variants and cultivated of seed’s material with deeply and high culture, technological schemes for substrates for *Agaricus bisporus* and *Pleurotus ostreatus*, standardization of this production also.

**Extensive mushrooms’ growing.** The programmer are studied the history of cultivated the medical and eating mushrooms in environment terms for extensiveness technologies, its nutrient and medical capacities. The wood’s characteristics for extensive technologies for wood’s mushrooms are described. All technology’s principles for cultivated such mushrooms as *Pleurotes ostreatus*, *Kuehnomyces mutabilis*, *Ganoderma lucidum*, *Flamulina velutipesia* and other few known mushrooms.

**Pest management of mushrooms’ growing.** The programmer are studied to the system’s protection of mushrooms in technologies. The element’s of this system, substrate’s diseases, in peat, aggregates and prophylactic’s methods, Pest biology and methods of decreased their damages. The fungicides and pesticides characteristics for technologies for mushrooms and houses for cultivation are described.

### **Master program “Methods for genetic control of plant”**

**Ecological genetics and plant special genetics.** This course of lectures for masters is based on genetic approaches to the study of ecological relationships. This course based on this principle in environmental genetics and genetics discussed in detail special independent research areas such as genetic control of environmental relations and variability characteristics of sensitivity to environmental factors and factors of biological nature. The course provides a historical perspective of the ideas and methods of biological science.

**Laboratory work.** The purpose of teaching – to give students an idea of legal, organizational, technical and methodological aspects of the establishment and functioning of the laboratory of molecular diagnostic analysis of crop production and other laboratories with similar objectives and activities, implementation and operation of the quality management system of laboratories; provide practical skills in applying the principles and methods of formation and functioning of the laboratory, the use of specific methods and approaches for solving control of qualitative and quantitative indicators and signs.

**Methodology and technical support modern genetic research.** The purpose of teaching to give students a thorough understanding of the modern platform of genetic analysis, basic facilities and platforms for primary nucleotide sequence genomes of slice genetic analysis, sophisticated tools for microscopy and molecular imaging processes provide practical skills bioinformatics analysis sequencing and analysis of genomes.

**Molecular diagnostics in crop production and environmental management.** The purpose of teaching – to give students an idea of the principles and methods of molecular diagnostic tests, their scope in the field of genetic analysis, the principles of the application of molecular diagnostic methods in the analysis of genotypes and seed quality, solving the formation of new high value genotypes of plants and quality control of reproduction of these genotypes. Develop skills to use molecular techniques to create new genotypes of plants and labeling agronomic traits.

**Systems analysis as objects of the environment and plant production.** The aim of the course to introduce students to the methodology of the study of the properties and relations on objects that are difficult to computerization observed by representing these objects as purposeful systems, provide practical skills application system methodology for the analysis, modelling and design of complex natural objects at different levels of organization of living matter, of computer information systems and works with

---

existing, solving information problems in them develop skills using practical methodologies systems analysis for Logical-physical modeling and design of computer information systems, in the form of future specialists systemic thinking.

**Transgenic technology, DNA technology of plant.** Academic discipline “Transgenic technology, DNA technology of plant” is one of the special disciplines that study in “Breeding and Genetics agriculture crops”. The current crop is largely based on advances in molecular biology, knowledge of the molecular organization of the vital processes of cells and organisms. The development of molecular biology has led to the development of new methods and approaches in working with plant organisms that have the title “DNA technology”. These technologies include methods for working with DNA in vitro, creating recombinant DNA molecules, creating new forms of plants containing artificially entered, DNA, molecular-genetic analysis of plant-based form of knowledge about the structure of DNA and so on.

*Research oriented disciplines*

**Master program “Scientific and innovation activity in horticulture”**

**Research and innovation in horticulture.** In the field of horticulture scientists from Ukraine developed new elements of technology growing fruits, berries and grapes, a great number of varieties for all soil-climatic zones technologies of post harvest handling and processing of horticultural products. All these developments require advanced specialist knowledge and practical skills not only in development, but also the introduction of an innovative model of ensuring legal protection of research results. Intelligent product as a product (technology, varieties, etc.) requires the ability to provide specific marketing, investment, Realizable services. In subjects described the essence of innovation and competitiveness of horticultural science, theoretical and methodological foundations of innovative business, presents the basic concepts of innovation. Much attention is paid to the analysis of components of innovation – scientific, technological, economic and social causes of horticulture and viticulture. Considered in detail the legal framework as a basis for innovative business in these areas. In this discipline also highlights scientific and methodological foundations of innovation policy in Ukraine.

**Subtropical culture.** Subtropical culture as an academic discipline in shaping future professionals the knowledge and skills of the technology of fruit, which are valuable food for the population and raw materials processing plants. The basic foundation of studying subtropical crops is scientific information disciplines such as botany, plant physiology, horticulture, plant protection, agricultural chemistry, technology, storage and processing of crop production. A study of the subject matter "Subtropical Culture" student must Know: state and development prospects of subtropical fruit, meaning, morphological and biological characteristics of subtropical crops, physiology, resistance to environmental factors and patterns of fruiting, modern technology of growing high yields of organic fruit in subtropical zones; able: design subtropical fruit plantations for different ownership entities, to develop, improve, advanced technology products cultivation of subtropical crops, manage processes yield formation, to develop and implement measures to improve quality and reduce product losses subtropical crops, to ensure their high economic efficiency. To become students of profound knowledge and skills to be used natural samples, conduct workshops in greenhouses and greenhouses. Control of knowledge and skills is carried out by individual tasks and laboratory work, modular control and passing an examination.

**Forecasting and programming harvest fruit crops.** As a result of studying this course, students should know the essence, principles and stages of programming, through the rational use of controlled and uncontrolled factors of the crop. To determine the level and factors yield. Predict and program yields fruit and berry crops by computer software. Calculate the potential for a specific site, climatic, really and production levels may yield

fruits and berries major crops and to identify factors limiting crop. Identify different methods based on the optimal use of natural and economic resources estimated yield.

**Master program “Scientific research and innovation work of vegetable growing”**

**Approbation of vegetables and melons crops.** The seeds production of vegetables is an important branch of vegetables grown. The lecture discipline course consists of two modulus and practically-laboratory lessons. The first is devoted to the law of the testing and the second – to analysis of the approbation features of the varieties and the heterotic hybrids of vegetable crops. In it is given contemporary methods of approbation (inspection of seed quality) varieties and heterosis hybrids of vegetables, including the laws of seed growing in Ukraine. The lecture course of the subject consists of two modules. Special features of training of the inspectors-approvers. The organization of testing (inspection) in the field. The principles of the legislation of seed production and testing (inspection). The preparation of documents after inspection. Masters acquainted with the documentation and its filling in laboratory studies. Lessons are conducted on the training-experimental in laboratory and field conditions using interesting examples.

**Organic vegetable.** With every year in the world of problem of ecologization become all more actual. Development of organic production one of bases of this problem. It is therefore necessary to conduct study which engulf development of organic production as well as in Ukraine, so in the world. The topics of our lectures for reproduction of soil fertility and conservation. The need for development of rural areas and raising the living standards of rural population. The need to increase efficiency and profitability of agricultural production. Necessity to guarantee of the healthy consumer market with quality products. The need to strengthen export capacity. The need to improve Ukraine's image as a manufacturer and exporter of high quality healthy organic products. Ensuring food security in Ukraine. Improving the welfare of citizens of the state.

**Scientific research and innovation work of vegetable-growing in open field.**

The vegetable growing of Ukraine is very dynamic and constantly demands new ideas for development. The subject matter is the final in the training of masters and includes three modules. The first dedicated legislation on innovation policy in Ukraine, the second - the basics of science, and the third – the basics of innovation. In this subject matter served basis legislation science of science and innovation. In it is given contemporary methods of scientific research and introduction of know-how and innovation work in vegetable-growing. History of innovation in horticulture. The role of technology in modern achievements of vegetable growers in Ukraine and in the world. Ukrainian scientists vegetable growers and their role in the development of know-how. Lessons are conducted on the training-experimental in laboratory and self-reliant work.

**Master program “Standardized technology storage and processing of fruits and vegetables”**

**Post harvest handling storage and transportation of vegetables.** Discipline is in the final production technologies vegetables and fruits. Organization of effective logistics resulting crop of vegetables is not possible without knowledge of the physical and physiological properties of each type of vegetable. Discipline gives knowledge of these properties of large groups of vegetables cabbage (capitate, cauliflower, Brussels sprouts, kohlrabi), root crop (carrots, beets, celery, horseradish, parsley, radish, radish, etc.), fruit (tomatoes, cucumbers, peppers, eggplant, etc.) Pumpkin, Onion. Knowledge vegetables like object transportation, handling and storage provides a choice of optimum conditions for these processes, the choice of modes of short-term or long-term storage. Discipline teaches choosing the optimal timing of harvesting vegetables, fruits and berries for marketable yield values obtained and dependent profitability.

**Technology of processing vegetables.** Discipline teaches the basic techniques of vegetables and fruits and berries raw enabling with minimum losses and maximum profit function vegetable industry and businesses to produce fruits. Discipline teaches basic technological features of each type of vegetable, fruit, berries, their suitability for a particular type of processing, receiving some tinned food and biological value. Discipline provides knowledge of standardized technologies for finished products biochemical method, heat sterilization. Discipline teaches optimal conduct processes of preparation of raw material (sorting, sizing, cleaning, inspection, cleaning), and the implementation of the basic manufacturing operations (selection of recipes modes) of the main raw material, spices, and other shading for finished products to the final operations: packaging, heat treatment. Teaches rules of process control of all processing operations and storage of finished canned products.

**Standardization, certification and commodity processed vegetable products.** Discipline studies in parallel with the study subjects for processing fruits and vegetables. Knowledge Standard material correlates with the functioning of standardized processes required for canned products which meet the requirements for a trademark or other type of finished product. Only knowledge of trade requirements for organoleptic, physic-chemical parameters to a certain type of finished canned products enables its manufacturer direct all operations – select, raw materials, manufacturing processes set, operation of machines, selecting components compositions and their preparation and others – at a given quality of the finished product. Discipline teaches the rules of certification, assessment techniques commodity as a raw material and finished products, method of payment for the sold canned products.

---



**Master Training  
in specialty “SELECTION AND GENETICS OF AGRICULTURAL CROPS”  
branch of knowledge “Agriculture and forestry”**

**Form of training, licensed number of students:**

– full-time 25 persons

– correspondence 25 persons

**Term of study** 1,5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian, English, German

**Qualification of graduates** Selection and crop genetics researcher

**The concept of training**

Preparation of masters in the field focused on the formation of students knowledge and practical skills in scientific principles of genetics and breeding of field crops, organization and conduct of state of scientific and technical examination of varieties and hybrids of Ukraine, theoretical bases and organization of seed work, development technologies of preserving resources of seed for further growth and stabilization of production of crop products in Ukraine.

A specialist trained to work in research institutions of Ukraine, station of variety testing and research centers, companies different ownership forms of cultivation, preparation and implementation seeds and planting material, as well as educational institutions.

**Production oriented master program**

***Master program “State scientific and technical expertise of plant varieties and their legal protection”***

The main objective of the program is the master of students' master necessary theoretical knowledge and practical skills for organizing and conducting the state of scientific and technical examination of varieties and hybrids of agricultural crops. The main section of the program is the goal and objectives of the state of scientific and technical examination of varieties and hybrids of agricultural crops in Ukraine, its types (BOC test and examination for fitness for distribution in Ukraine), the main steps of the methods and techniques cultivar, registration of varieties and hybrids in the Ukraine, post-registration study them. Chapter Master program is to develop national varietal resources of the country, the legal protection of varieties and hybrids in Ukraine and in the countries – members of UPOV, inspectorial supervision during the civil circulation varieties and hybrids. Students will be familiar with the organization and structure of the state system for the protection of plant variety rights in Ukraine, the legal framework.

**Sphere of graduates employment**

Ukrainian Institute of expertise plants, regional expertise centers national crop varieties state stations, industrial agricultural enterprises of different ownership.

**Research oriented master program**

***Master program “The use of biological variety as sources economic valuable signs and creation of new donors for the selection of modern sorts and hybrids”***

---

The primary purpose of the master's degree program is forming for the listeners of city council of necessary theoretical knowledge for the practical selection of agricultural cultures. In the process of studies students will be acquainted with basic tasks and directions of selection of, leguminous, oil-bearing, technical, forage, vegetable grain-crops, with their modern assortment. The program envisages the study of plant-breeding aspects of creation of competitive sorts and hybrids, genetic resources of plants(cultural and wild family kinds) as sources and donors economic important signs for a selection, including high yield, combination ability, to firmness against biotic and abiotic factors, technologicalness, internalss and others like that, and also modern methods and methodologies of creation and evaluation of new feedstock, technology plant-breeding process. The program envisages also the acquaintance of students with the features of modern conduct of насінницької work in the conditions of reformation of agroindustrial complex.

### **Sphere of graduates employment**

Postgraduate studies, research establishments, production.

### **Master program of applied biology specialization “Laboratory work” for expert control sphere of employment**

#### ***Master program “Methods for genetic control of plant”***

The master's program provides theoretical and practical study of modern methods of diagnosis and biological control of biological objects – seeds, breeding material, and other products, equipment principles molecular genetic laboratories, the organization of work in the lab, basic concepts in the field of metrology, standardization and certification principles kinetic, biochemical, biological methods, current approaches create genetically modified organisms, especially their comprehensive diagnosis in raw materials and in consumer products, molecular markers, their types and methods of application.

### **Sphere of graduates employment**

Admission to PhD program of NULES of Ukraine and other higher educational establishments, employment in advanced agricultural industrial enterprises, scientific-research establishments of NAAS of Ukraine. Agricultural enterprises of different ownership, regional and district administration, advanced farms, companies, holdings and corporations, scientific-research establishments of NAAS of Ukraine.

### **Practical training**

Students receive practical training in teaching and research farms National University of Life and Environmental Sciences of Ukraine, at research institutions of Ukraine, at station of variety testing and research centers, companies different ownership forms of cultivation, preparation and implementation seeds and planting material and seed.

### **Proposed Topics for Master Theses**

1. The studying of homozygotization on frequency of homologous recombination of *Arabidopsis thaliana*.
  2. Morpho-biological characteristics of breeding lines of *Phaseolus vulgaris* L. and especially their inheritance.
  3. Grade of samples of soybean advance variety testing on nursery garden.
  4. Performance and stability of yield variety samples of *Phaseolus*.
  5. Features exercise of quantitative characters of cleistogamous lines of maize on National University of Life and Environmental Sciences of Ukraine “Agronomic Research Station”.
-

6. The value of Western European genetic plasma to selection for winter wheat in Ukraine.
7. Influence of abiotic factors and micronutrients on seed production of new intense varieties of winter rape.
8. Combinational ability of cleistogamous lines of maize.
9. Evaluation of alfalfa seed in the nursery garden competitive variety testing.
10. Effect of micronutrient Wuxal on seed production of winter wheat varieties of Artemis.

**Academic rights of applicants for a master program**

In addition to the specialty “Plant breeding and Genetics of agriculture crop” applicants with a bachelor of arts in the direction of “Agriculture” can continue studying the field of knowledge **“Agriculture and Forestry”**:

- 8.09010101 – Agronomy (see p. 19);
- 8.09010102 – Agrochemistry and Soil Science (see p. 41);
- 8.09010104 – Fruit and Vegetable Science and Viticulture (see p. 51)

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality management, standardization and certification”, Master’s program “Quality management of plant production, water, soil and pesticides” (see p. 176);
- 8.18010021 – “Pedagogy of Higher School”, Master’s program “Methodical of science of circles disciplines in plant and processing’s productions” (see p. 434);
- 8.18010018 – “Administrative managements”, Master’s program “Management of horticultural, vegetables and greenhouses markets” (see p 3977);
- 8.18010020 – “Management of educational institutes” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Selection and Genetics of Agricultural Crops”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. The cycle of professionally oriented, humanitarian and socio-economic training*</i>					
1	Business foreign language	1	72	1,3	2,0
2	Philosophy of science	1	90	1,7	2,5
<i>Total number</i>			162	3,0	4,5
<i>1.2. The cycle of natural-scientific, professional and practical training*</i>					
1	Special crop genetics	2	108	2,0	3,0
2	Labor protection in industry	1	54	1,0	1,5
3	Genetic engineering and biotechnology	1	108	2,0	3,0
4	Post harvest handling, storage and certification of seeds and propagating material	1	72	1,3	2,0
5	Plant genetic resources	1	90	1,7	2,5
6	Modern breeding methods and techniques	1	90	1,7	2,5
7	Genetics of plant immune system	1	72	1,3	2,0
8	Special breeding and seed production of field crops	2	180	3,3	5,0
9	Special breeding and seed production of vegetables and fruits	2	90	1,7	2,5
10	Environmental and adaptive breeding of field crops	2	90	1,7	2,5
11	Genetics of quantitative traits	2	72	1,3	2,0

**MASTER DEGREE PROGRAMS**

<i>Total number</i>		1026	19,0	28,5	
Total according to regulatory part		1188	22,0	33,0	
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. The cycle of professionally oriented, humanitarian and socio-economic training*</i>					
1	Information technology in plant breeding	1	108	2,0	3,0
2	Legal protection of plant varieties	2	108	2,0	3,0
<i>2.1.2. The cycle of natural-scientific, professional and practical training*</i>					
1	Agricultural and environmental law	1	108	2,0	3,0
2	State qualifying examination of sorts of plants	3	126	2,3	3,5
3	Varieties certification	3	126	2,3	3,5
4	Seed-growing of hybrids agricultural cultures	3	108	2,0	3,0
5	Selection and seed-growing of hybrids agricultural cultures	3	198	3,7	5,5
6	Examination of plant varieties for patentability	3	162	3,0	4,5
<i>Total chosen by university</i>		684	12,7	19,0	
<i>2.2. Disciplines chosen by students</i>					
<i>2.2.1. Cycle of professional and practical training *</i>					
<i>Production oriented disciplines</i>					
Master program "State scientific and technical expertise of plant varieties and their legal protection"					
1	Inspector supervision and control	3	144	2,7	4
2	Information technologies are in State scientific and technical examination	3	144	2,7	4
3	Post registration cultivar investigation	3	216	4,0	6
<i>Total selected by the students</i>		504	9,3	14,0	
<i>Master program "Methods for genetic control of plant"</i>					
1	Ecological genetics and special plant genetics	3	72	1,3	2,0
2	Laboratory work	3	108	2,0	3,0
3	Methodology and technical support modern genetic research	3	72	1,3	2,0
4	Molecular diagnostics in crop production and environmental management	3	72	1,3	2,0
5	Systems analysis as objects of the environment and plant production	3	90	1,7	2,5
6	Transgenic technology, DNA technology of plant	3	90	1,7	2,5
<i>Total selected by the students</i>		504	9,3	14,0	
<i>Research oriented disciplines</i>					
Master program "The use of biological variety as sources economic valuable signs and creation of new donors for the selection of modern sorts and hybrids"					
1	Applied genetics	3	144	2,7	4,0
2	Examination grades for suitability for distribution in Ukraine	3	144	2,7	4,0
3	Modern methods of identifying varieties and hybrids	3	216	4,0	6,0
<i>Total selected by the students</i>		504	9,3	14,0	
Total number of elected part		1188	22,0	33,0	
Practical training		468	8,7	13,0	
Writing and defense of master's thesis		180	3,3	5,0	
Total for specialty		3240	60,0	90,0	

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

1.1. *The cycle of professionally oriented, humanitarian and socio-economic training\**

**Business foreign language.** The course is aimed at the communicative and professional foreign language. Practical language skills is an essential organic component

of modern training institutions of higher education. Learning a foreign language in non-linguistic institution, pursuing practical goals are inextricably combined with general and educational objectives. Learning a foreign language in high school promotes educational and professional level.

**Philosophy of science.** The course is highlighting the specifics of philosophy of science as the special type of humanitarian knowledge and as of learning subject. The characteristic of historical development of science and philosophy of science is given. The main problems of general and scientific methodology, structure of cognition process, scientific ethics, scientific world outlook content and development are discussed. The special attention is given to problems of modern science and possible ways of it's interaction with another spheres of society, as well as to problems of biological science and ecology. The course is notable for it's outlooking orientation, which allows to synthesize acquired knowledge in specialized subject and in the humanities, in the integral scientific world perception – the theoretical basis of the magisterial specialists schooling level.

*1.2. The cycle of natural-scientific, professional and practical training\**

**Special crop genetics.** The Special Genetics science is the genetics of individual species. It is the knowledge systematization of karyological and genomic analysis, of genetics and phylogenetics of signs, of mutagenesis, of polyploidy, of heterosis and inbreeding, of populations genetics and other issues of genetics of separate species. This Special Genetics course was designed to show to students the basic nature of the inheritance of quantitative and qualitative features of species. In this course are shown main questions from the Special Genetics of field crops that are grown in Ukraine: grain, legumes, cereals, oil, forage, and crops for technical purposes. This course includes the general information from biology, morphology and ecology of selected crops and information about source material and areas of genetic research of this crops.

**Labor protection in industry.** It normatively applied discipline, that on the basis of analysis of production and harmful factors, caused production processes in agriculture, offers the scientifically grounded measures organizational to prevent an accident rate, traumatism, professional diseases of workers.

**Genetic engineering and biotechnology.** The course includes the study of problems and prospects of genetic engineering and biotechnology and considers such sections as molecular biology, genetic engineering of plants, principles and usage of somatic hybridization and cybridization, clonal micropropagation of plants, biosafety. Discipline enables students to master the basic techniques of plants culture in vitro, to master the basic methods and techniques of genetic engineering, to understand the usage of biotechnological methods in a crop production and breeding.

**Post harvest handling, storage and certification of seeds and propagating material.** Discipline including study thus questions, study of the foundations storage of seed and propagating material, especially the main storage of seeds of cereals, pulses, oil seeds and planting material, the existing requirements for seed and planting material are controlled by for the certification.

**Plant genetic resources.** Genetic diversity of species, varieties and forms of plants differ in the direction of use, quality, adaptability, and other agronomic traits. This source material is one of the key factors in ensuring food security and sustained agricultural production. The rapid scientific and technological progress, environmental issues, the disappearance of many wild species, narrowing varietal diversity of cultivated plants is the need to collect and preserve genetic samples of plants. Increasing the value and role of germplasm through the development of genetics and the use of new technology selection process. Wild species, ancient local varieties and breeding varieties in their genetic systems have many valuable genes, their genetic basis will always be a source of raw

---

material for a new generation of varieties. For efficient use of such material is necessary to know and to use international experience to preserve genetic resources and basic genetics bank plant system for Plant Genetic Resources of Ukraine and the principles of collections of genetic resources, types of collections, the basic genetic centers of origin and shaping plants, their localization and scientific basis of plant introduction

**Modern breeding methods and techniques.** Modern breeding methods and techniques course aims familiarizing of students with principles of modern approaches, which could be applied in breeding work. The course consists of the following sections: in vitro culture techniques and ways of practical application, haploid and dihaploid production, polyploidy and remote hybridization, genetic engineering and recombinant DNA technology, methods of transgenic plants producing, DNA-markers and its application in breeding, modern gene mapping approaches. The course includes listening of lectures, analyses of practical tasks concerning molecular biology, genetic engineering and in vitro culture as well as practical work in DNA-laboratory.

**Genetics of plant immune system.** Students should be familiarized with modern knowledge concerning immunity, plant immunity, types of plant diseases and pathogens as well as with molecular mechanisms of resistance to pathogens, diagnostics methods and principles of creating plants, which are resistant to pathogens.

**Special breeding and seed production of field crops.** Special selection of major field crop breeding technology highlights individual cultures based on their biological and genetic characteristics, as well as the existing gene pool. At the present stage in the breeding work of many cultures are widely used polyploidy induced mutagenesis, heterosis based CMS and nuclear male sterility of biotechnology and genetic engineering. To conduct effective seeding operation necessary knowledge and ability to use different methods of selection, to grow seed crops, to conduct species and varieties of cleaning, make a plan and varietal updates, identify varieties and hybrids of major agricultural crops to prevent biological and mechanical clogging varieties and hybrids, the calculations needs seeds, execute documents on varietal and hybrid seeds to store and use this seed.

**Special breeding and seed production of vegetables and fruits.** The subject matter includes two modules. The first is dedicated to breeding varieties and heterosis hybrids of vegetable crops and especially their seed and the second - the breeding of fruit crops and their rootstocks. In the first module served basis varieties and heterosis hybrids of vegetable crops and breeding processes, the doctrine of initial material, the study of signs. The special attention is given to methods of selection for heat resistance, cold resistance, drought tolerance, etc. The basis of the course selection is modern advances in breeding of cabbage, carrots, cucumbers, tomatoes and other crops. The second module is devoted to breeding varieties, clones and grape fruit crops - apples, pears, strawberries, raspberries, blackberries and other fruit and berry crops. In laboratory studies masters study varietal composition of vegetable and fruit crops and methods of their creation and reproduction in field and laboratory conditions.

**Environmental and adaptive breeding of field crops.** Introduction to the practice resistant to abiotic and biotic factors of the environment of the varieties is the most effective method of increasing the productivity of sorts. A lot of varieties that are resistant to certain negative factors of the environment were withdrawn without understanding the mechanisms of this stability. For increase of efficiency of creation of resistant varieties need to understand the mechanisms of resistance to stress factors. Among the means to achieve an understanding of mechanisms of stability of plants should specify: the accumulation of fundamental knowledge about the protective mechanisms of plants; the study of physiological and biochemical mechanisms, which provide the morphological stability of plants to stress and pathogens; study of existing assessment methods and the creation of the initial material of adaptive to extreme environmental conditions and their improvement and creation of new ones. The main purpose of study of discipline is

---

acquisition by the students of knowledge of the theoretical foundations of adaptive breeding of field crops to stress and the skills of their practical application.

**Genetics of quantitative traits.** Theoretical and practical definition of genetic parameters. The arithmetic mean ( $\bar{x} \pm sh$ ) and its error standard deviation ( $sh \pm ss$ ), varying characteristics ( $V + Sv$ ), amplitude variability ( $lim$ ). Odds inheritance ( $H_2$  i  $h_2$ ), their definition and use. Definition of strategy selection on quantitative traits. Phenotype correlation coefficients ( $r_p$ ), genotype ( $r_g$ ), adaptive ( $r_a$ ). Their meaning and use in breeding. Correlation galaxy (clusters).

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. The cycle of professionally oriented, humanitarian and socio-economic training\*

**Information technology in plant breeding.** The course introduces students to the concept of information technology, information systems, their value, basic components, the methods and technologies of information technology in gardening and horticulture. During laboratory acquired modern program for processing different types of i, and applications to analyze data related to vegetable gardening. Most of the course is devoted to the study of the most common information technologies that allow agronomy specialist in professional and academic solve problems, analyze results and make the right decision.

**Legal protection of plant varieties.** The doctrine of intellectual property. Features a variety of plants, as an object of intellectual property and its transformation into a legal entity. General and specific legislation on the legal protection of plant varieties. International regulations on intellectual property for a plant variety. Types of legal protection. Organizational and administrative enforcement of the legal protection of plant varieties during their commercial use. Classification and characterization of plant variety rights in the software, and restore features and characteristics of plant varieties established state qualifying examination. System of protection of owners' title documents. Legal protection - the basis of market relations in plant breeding and seed production.

#### 2.1.2. The cycle of natural-scientific, professional and practical training\*

**Agricultural and environmental law.** On the modern stage of reformation of agrarian sector of economic professional preparation of specialists in industry of agriculture, well-informed in legal questions, acquires an actual value. In this connection the task of increase of level of knowledges appears by the master students of in the agrarian-legal, land-legal and ecology-legal relations. It needs development and introduction to the educational process of agricultural higher educational establishments and faculties of legal disciplines, in particular, disciplines of the "Agrarian and ecological law". The purpose of course of the "Agrarian, land and ecological law" is forming of the system of knowledges from the legal regulation of agrarian relations, legal providing of economic activity of agricultural enterprises, landownership and land-tenure, guard of natural environment, rational use of natural resources, providing of ecological safety.

**State qualifying examination of sorts of plants.** Discipline envisages the study of existent types of scientific and technical examination, complex of the field and laboratory researches on results that an eventual decision is accepted in relation to state registration of sorts (hybrids) of agricultural cultures та/або state registration of rights on them. The theoretical and practical course of discipline will give knowledge to the future specialists on the methods of authentication of sorts of plants and their application during state registration of sorts and acquisition of property right on a sort, as an object of intellectual property. The study of discipline will assist acquisition of skills from determination of indexes of fitness of sort to distribution, criteria of prohibition.

**Varieties certification.** Discipline envisages opening authentications, that provides exact and objective determination of sort, creation of modern nomenclature of kinds and

intraspecific sippes for the passport system of gene pool of cultural plants and them wild kinds with the aim of account, maintenance and effective use in a selection. A theoretical and practical course will acquaint future specialists on modern methods and criteria authentications of plants, that must be reliable and recreated at different terms growing, at the same time accessible for wide use.

**Seed-growing of hybrids agricultural cultures.** The primary purpose of study of discipline is an acquaintance of students with scientific bases of receipt stably of high harvests of seed of heterosis hybrids and synthetic sorts of the field cultures: corn, sugar beets, sorghums, sunflower, rye winter-annual, canola, alfalfa, clover and others like that, with the systems of seed-grower of these cultures in Ukraine. The divisions of discipline are methods of production of hybrid seed on fertile basis and with the use of cytoplasmic and genic masculine sterility, on the basis of selfsterility, with the use of alarm genes, charts of growing of hybrid seed, feature of reproduction of paternal components of hybrids, realization of internal and state control and other.

**Selection and seed-growing of hybrids agricultural cultures.** The primary purpose of study of discipline is forming for the students of necessary theoretical knowledge for the practical plant breeding of agricultural cultures on a heterosis and seed-growing of hybrids, synthetic sorts. Discipline envisages the acquaintance of students with the genetic aspects of heterosis, with the modern state, achievements, tasks to the plant breeding of the field cultures on a heterosis, with the basic stages and methods of creation of interlinear hybrids of corn, sugar beets, sorghum, sunflower, rye winter-annual, canola, and also synthetic sorts of the field cultures, with methodologies of evaluation of plant-breeding material, technology of plant-breeding process. The division of discipline is a seed-growing of hybrids and synthetic sorts of the field cultures: methods of production of hybrid seed with the use of cytoplasmic and genic masculine sterility, with the use of alarm genes, charts of growing of hybrid seed, feature of reproduction of paternal components of hybrids, realization of internal and state control and other.

**Examination of plant varieties for patentability.** Quality plants as intellectual property. Biological and legal criteria ability protection plant variety. Concepts and components of the examination procedures for patentability of plant varieties. Formal qualifications and expertise. Signs sorts of qualifications and application expertise. Place varietal collections in determining patentability grade. Methodical support qualifying examination. Regulatory and legal framework for state registration of plant varieties. The role and importance of breeding achievements in the formation of high-grade plant resources and their use.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical training \**

#### *Production oriented disciplines*

#### **Master program “State scientific and technical expertise of plant varieties and their legal protection”**

**Inspector supervision and control.** Theoretical and practical course of discipline envisages acquisition the students of theoretical knowledge and practical abilities from a state supervision and control after inhibition of manage subjects, regardless of patterns of ownership, requirements of legislation from the guard of rights on the sorts of plants at a production, use, storage, realization and reproduction of seed and planting material of agricultural cultures in the process of recreation and commercial turnover. Students will be acquainted with modern forms and methods of inspector supervision and control, by verification of stored of sorts of agricultural cultures in the process of their commercial turnover.



**Information technologies are in state scientific and technical examination.**

The theoretical and practical course of discipline exposes ways and forms of receipt, piling up, maintenance and use of information on a request on a sort, got results during realization of formal and field examinations and acceptance of eventual decision in relation to a sort. Generalization of front-rank experience, own developments, suggestions at the market of facilities of software and their introduction will give an opportunity to promote an operation ability and quality of executable in State scientific and technical examination researches, their exactness and objectivity.

**Post registration cultivar investigation.** Discipline envisages the acquaintance of students with an aim and tasks of післяреєстраційного study of sorts and hybrids of agricultural cultures, with methodical bases and methodical providing of his realization. Receipt of information on the reaction of the new registered varieties(hybrids) of agricultural cultures in relation to firmness them against the extreme factors of environment, most шкодочинних illnesses and wreckers, comparing to the results of state сортовипробування, financial viability of growing of newly registered varieties and influence of them on volumes and structure of sowing areas, forming of national of high quality resources are the basic divisions of given discipline.

**Master program of applied biology  
specialization “Laboratory work” for expert control sector of employment**

**Master program “Methods for genetic control of plant”**

**Ecological genetics and special plant genetics.** This course of lectures for masters is based on genetic approaches to the study of ecological relationships. This course based on this principle in environmental genetics and genetics discussed in detail special independent research areas such as genetic control of environmental relations and variability characteristics of sensitivity to environmental factors and factors of biological nature. The course provides a historical perspective of the ideas and methods of biological science.

**Laboratory work.** The purpose of teaching – to give students an idea of legal, organizational, technical and methodological aspects of the establishment and functioning of the laboratory of molecular diagnostic analysis of crop production and other laboratories with similar objectives and activities, implementation and operation of the quality management system of laboratories; provide practical skills in applying the principles and methods of formation and functioning of the laboratory, the use of specific methods and approaches for solving control of qualitative and quantitative indicators and signs.

**Methodology and technical support modern genetic research.** The purpose of teaching to give students a thorough understanding of the modern platform of genetic analysis, basic facilities and platforms for primary nucleotide sequence genomes of slice genetic analysis, sophisticated tools for microscopy and molecular imaging processes provide practical skills bioinformatics analysis sequencing and analysis of genomes.

**Molecular diagnostics in crop production and environmental management.** The purpose of teaching – to give students an idea of the principles and methods of molecular diagnostic tests, their scope in the field of genetic analysis, the principles of the application of molecular diagnostic methods in the analysis of genotypes and seed quality, solving the formation of new high value genotypes of plants and quality control of reproduction of these genotypes. Develop skills to use molecular techniques to create new genotypes of plants and labeling agronomic traits.

**Systems analysis as objects of the environment and plant production.** The aim of the course to introduce students to the methodology of the study of the properties and relations on objects that are difficult to computerization observed by representing these objects as purposeful systems, provide practical skills application system

methodology for the analysis, modeling and design of complex natural objects at different levels of organization of living matter, of computer information systems and works with existing, solving information problems in them develop skills using practical methodologies systems analysis for Logical-physical modeling and design of computer information systems, in the form of future specialists systemic thinking.

**Transgenic technology, DNA technology of plant.** Academic discipline "Transgenic technology, DNA technology of plant" is one of the special disciplines that study in "Breeding and Genetics agriculture crops". The current crop is largely based on advances in molecular biology, knowledge of the molecular organization of the vital processes of cells and organisms. The development of molecular biology has led to the development of new methods and approaches in working with plant organisms that have the title "DNA technology". These technologies include methods for working with DNA in vitro, creating recombinant DNA molecules, creating new forms of plants containing artificially entered, DNA, molecular-genetic analysis of plant-based form of knowledge about the structure of DNA and so on.

*Research oriented disciplines*

**Master program "The use of biological variety as sources economic valuable signs and creation of new donors for the selection of modern sorts and hybrids"**

**Applied genetics.** Discipline is designed for students of Master's Degree in specialty plant breeding and genetics. The course informs about specific genes and gene system that people use in their utilitarian activities. The course includes information about genes that control the quality of plant products such as genes of fatty acid, amino acid and carbo hydrate composition of basic organic molecules, genes, and genes that determine their architecture of plant and genes that are part of the genetic systems of controlled breeding. Discipline involves the examination of genetic system and certain genes involved in the selection process and is the basis for agronomic traits, such as gene structure and biochemical composition of plants, which is their main products of certain species, genes that determine control crossing systems

**Examination grades for suitability for distribution in Ukraine.** Theoretical and practical background of expertise and the development of plant varieties for suitability for distribution. The concept of a plant variety as a biological means of plant products. Criterion prohibition on the use class. Procedure, circuits and methods of field and laboratory studies of biological morphology, agronomic, and ecological properties and characteristics of the variety. Acquisition and sale of intellectual property rights on plant varieties. Turnover of plant varieties. Features Post-cultivar. Formation of market of plant varieties.

**Modern methods of identifying varieties and hybrids.** Methods for identifying varieties and hybrids are traditionally based on an assessment of morphological and agronomic traits. Using these methods, relevant and currently for field collections, but has some limitations for identifying high-quality gene pool, which is kept under controlled conditions in vitro and cryopreservation. The use of proteins and isozymes for identification of varieties and hybrids is limited because proteins are characterized by low polymorphism and isozyme spectra can affect the physiological state of plants. These limitations are removed by using DNA markers. In the last decade to study the genetic diversity and genotyping varieties and hybrids are widely used DNA markers based on the use of polymerase chain reaction: RAPD, ISSR, AFLP, SSR, of which the most effective microsatellite or SSR markers.

**Master Training  
in specialty “PLANT PROTECTION”  
Branch of knowledge “Agriculture and Forestry”**

<b>Form of training, licensed number of students:</b>	
– full-time	75
– correspondence	45
<b>Term of study</b>	1,5 years
<b>Credits</b>	90 ECTS
<b>Language of teaching</b>	Ukrainian, English
<b>Qualification of graduates</b>	Plant Protection Scientists

**The concept of training**

Experts in the field of plant protection should have interdisciplinary theoretical knowledge about future activities and development of practical skills application of knowledge gained in the process of production and training practices and master's work. During the program, students acquire knowledge in such areas: entomology, phytopathology, herbology and plant quarantine. Experts in Plant Protection should have profound knowledge of biology, ecology, distribution, and damage characteristics of plants, breeding of pests, ensure phytosanitary control of seed and planting material, plants, soil, air, holding science-based support on the integrated protection of agricultural crops from pests, providing counseling for professionals of agricultural companies, farmers and private owners in carrying out measures to protect crops from pests and controlling of the situation.

**Production oriented master program**

***Master degree program “Phytomedicine”***

Provides specialist in phytopathology with knowledge of: pathogenic and saprotroph microflora of grain, control of hazards; level of crop damaging by varieties of pathogens, the study of the most effective measures for protecting plants from diseases.

**Sphere of graduates employment**

Graduates can work in supporting companies of forecasts and occurrence of pests, farms of different ownership, companies, associations, societies of agricultural direction, in the position of scientific-research institutions of plant protection in regional inspections of plant protection and related areas of work (agronomic and agrochemical service).

***Master degree program “Phytosanitary monitoring and forecasting”***

The program provides training for work in the State regional and district alarm services and forecasting of harmful and beneficial biodiversity of phytocenosis; inspections of plant protection and quarantine, pest control services, scientific research institutions, control and toxicological laboratories and biological plant protection, in farms of different ownership.

**Sphere of graduates employment**

Graduates can work in supporting companies of forecasts and occurrence of pests, farms of different ownership, companies, associations, societies of agricultural direction, in the position of scientific-research institutions of plant protection in regional inspections of plant protection and related areas of work (agronomic and agrochemical service).

---

***Master degree program “Plant quarantine”***

Program provides training of specialists with knowledge of domestic and European phytosanitary legislation; skills of pest control object control of internal and external plant quarantine, phytosanitary thorough examination; pest risk analysis of pests on the possibility of acclimatization in Ukraine; potential environmental and economic impacts and measures on their localization and elimination.

**Sphere of graduates employment**

Graduates can work as inspectors in the State Plant Quarantine Inspection of Ukraine and quarantine laboratories; departments of phytosanitary protection and plant quarantine; as research assistants and laboratory technicians in different research institutions of Ukraine.

**Research oriented master program**

***Master degree program “Biological justification of obligate and facultative pathogens control”***

Demands obtaining by the experts of multilateral interdisciplinary knowledge regarding justification of environmentally friendly measures of restricting the development of the most common obligate and facultative parasites of major crops and development of the skills of practical application of the gained knowledge.

**Sphere of graduates employment**

Graduates can work as researchers in research institutions of Ukraine, as heads of laboratories, technicians, senior experts; in services for testing of plant varieties for resistance against pests, in seed inspections, etc.

***Master program “Insect Management in Agroecosystems”***

Aimed at: regulation of phytophages insects in agroecosystem, forecast argumentation of the development, reproduction and population dynamics that are an integral part of crop growing technology. Students study the theoretical backgrounds of insect's self-regulation, that affects the changes of phytophage insects due to evaluation and analysis of regulation factors.

**Sphere of graduates employment**

Graduates can be employed as entomologists and ento-phytopathologists according to the classification in research institutions of Ukraine: Institute of Plant Protection, Institute of physiology, Institute of farming, Institute of energy crops and sugar beet, Institute of potato, etc.

**Master program of applied biology  
specialization “Laboratory work” for expert control sphere of employment**

***Masters program “Methods of entomological control in crop farming and environmental management”***

Aimed at: regulation of phytophage insects in agroecosystem, forecast argumentation of the development, reproduction and population dynamics that are an integral part of the crop growing technology. Masters study the theoretical foundations of insect self-management, that effects on changes of phytophage insects amount due to evaluation and analysis of regulation factors.

---

### **Sphere of graduates employment**

Professionals are trained to work in specialized laboratories of the State Veterinary and Phytosanitary Service of the country, the State Scientific and Technical Center of Soil Fertility Protection, the State Environmental Inspectorate, the State Inspectorate for Agriculture, etc.

### **Practical training**

Teaching and research farms of NULES of Ukraine: PC of NULES “Agronomic Research Station”, “Velykosnitynske TRF by the name of O. V. Muzychenko”, TRF of NULES of Ukraine “Fruit and Vegetable Garden”.

Research institutions of NAAS of Ukraine: Institute of Plant Protection, Institute of Microbiology and Virology, Institute of Horticulture, Institute of Ecological Hygiene and Toxicology by name of L.I. Medved, Institute of Zoology by name of I.I. Schmalhausen, Institute of Beekeeping, Institute of Agriculture, Institute of Bioorganic Chemistry, Research Center of the Institute of pomology by the name of L.P. Symerenko (Cherkasy reg., Horodyshe district, Mliev).

The State Veterinary and Phytosanitary Service of Ukraine and its regional units.

PC “Agro-Soyuz” Dnipropetrovsk region, CLL “Barishevsky Grain Company”, Rivne Plant Protection Research Station, State Kostopolsky varietal station in Rivne region, agency of firms in Ukraine producing pesticides: Syngenta, Monsanto, BASF, Arysta Life Science, Bayer, JSC “Trans Oil” and others.

### **Proposed Topics for Master Theses**

1. Optimization of useful insect culture in laboratory and production conditions.
2. Environmental peculiarities of leaf-eating fruit pests and influence of abiotic factors on the dynamics of their population.
3. Influence of anthropogenic factors on development of harmful insects.
4. Influence of biotical factors on development of herbivorous insects in green house terms.
5. Activity of ferments and their role in resistance to plant diseases.
6. Research of mikotoksin role in development of plant diseases.
7. Resistance of microbial cenosis structures of basic soil types while different use.
8. Comprehensive effect of herbicides on sowing of cereals, legumes, technical, oil and vegetable crops.
9. Specific composition and bio-ecological features of basic rodents at field crops and measures of their control.
10. Measures of imported vegetable material protection from managed quarantine and unquarantine herbivorous insects.

### **Academic rights of applicants for a master program**

The entrants with bachelor degree in Plant Protection can continue their studying not only in Plant Protection specialty, but also in other specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, Standardization and Certification”, Master’s Program “Evaluation of Crop Production, Water, Soil, Agricultural Chemical Quality” (see p. 176. );
  - 8.18010021 – “Pedagogy of Higher School”, Master’s Program “Methodology of Teaching Subjects in the Field of Plant Protection” (see p 434);
  - 8.18010018 – “Administrative Management”, Master’s Program “Market Management of Garden, Vegetable and Green House Products” (see p. 397);
  - 8.18010020 – “Educational Establishment Management” (see p. 427).
-

**MASTER DEGREE PROGRAMS**

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “Plant Protection”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	72	1,3	2,0
2	Logistic and communications in Plant Protection	1	72	1,3	2,0
3	Standardization and jurisprudence in plant protection	2	72	1,3	2,0
<i>Total number</i>			216	3,9	6,0
<i>1.2. Cycle of professional and practical training *</i>					
1	Managing the number of weeds in agrophytocenoses	1	108	2,0	3,0
2	Complex systems of crop plant protection from diseases	1	108	2,0	3,0
3	Phytofagous insect management	1	108	2,0	3,0
4	Civil Defence	1	54	1,0	1,5
5	Toxicology of Pesticides	2	144	2,7	4,0
6	Technology of mass rearing of beneficial insects	2	216	4,0	6,0
7	Epiphytology	1	144	2,7	4,0
8	Crop Seed pathology	2	144	2,7	4,0
9	Methodology and organization of scientific researches	1	108	2,0	3,0
10	Labour protection in plant protection	3	54	1,0	1,5
<i>Total number</i>			1224	22,7	36,0
Total according to regulatory part			1440	26,7	40,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of humanitarian, social and economic training*</i>					
1	Economic and organization of agricultural service	2	72	1,3	2,0
<i>Totally for the cycle</i>			72	1,3	2,0
<i>2.1.2. Cycle of professional and practical training *</i>					
1	Biosafety in Plant Protection	2	108	2,0	3,0
2	Desinfection of Management objects	1	108	2,0	3,0
3	Methods of plant protectant testing	2	108	2,0	3,0
<i>Totally for the cycle</i>			324	6,0	9,0
<i>Production oriented disciplines</i>					
Master program “Phytomedicine”					
1	Ecology of plant pathogens	3	108	2,0	3,0
2	Diagnostics of plants diseases	3	126	2,3	3,5
3	Mycological and phytopathological research methods	3	126	2,3	3,5
<i>Totally for the cycle</i>			360	6,6	10,0
Master program “Phytosanitary monitoring and forecasting”					
1	Experimental research methods in entomology	3	108	2,0	3,0
2	Insect pathology	3	126	2,3	3,5
3	Insects ecology	3	126	2,3	3,5
<i>Totally for the cycle</i>			360	6,6	10,0
Master program “Plant quarantine”					
1	International phytosanitarian standatrs	3	126	2,3	3,5
2	Introductive pests	3	126	2,3	3,5
3	Quarantine pest risk evaluation	3	108	2,0	3,0
<i>Totally for the cycle</i>			360	6,6	10,0
Master program “Methods of entomological control in crop farming and environmental management”					
1	Insect Biocenology	3	126	2,3	3,5

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
2	Methods and technical supply of modern entomological researches	3	126	2,3	3,5
3	Photo-sanitary and environmental assessment of project	3	108	2,0	3,0
<i>Totally for the cycle</i>			360	6,6	10,0
<i>Research oriented disciplines</i>					
Master program "Biological justification of obligate and facultative pathogens control"					
1	Actinomitsetes diseases of plant	3	108	2,0	3,0
2	Physiological and biochemical aspects of plant resistance to disease	3	126	2,3	3,5
3	Mycotoxycology	3	126	2,3	3,5
<i>Totally for the cycle</i>			360	6,6	10,0
Master program "Management of insect amount in the crop agrocenoses"					
1	Experimental research methods in entomology	3	108	2,0	3,0
2	Insect physiology	3	126	2,3	3,5
3	Technical entomology	3	126	2,3	3,5
<i>Totally for the cycle</i>			360	6,6	10,0
<i>Total chosen by university</i>			756	13,9	21,0
2.2. Disciplines at the student's choice					
2.2.1. Cycle of Professional and Practical Training*					
Production oriented disciplines					
Master program "Phytomedicine"					
1	Bacterioses of plants	3	72	1,3	2,0
2	Use the antagonistic organisms against agents that cause plant diseases	3	90	1,7	2,5
3	Methods of identification of plant disease agents	3	90	1,7	2,5
<i>Totally at the choice of the student</i>			252	4,7	7,0
Master program "Phytosanitary monitoring and forecasting"					
1	Technical entomology	3	108	2,0	3,0
2	Insect physiology	3	144	2,7	4,0
<i>Totally at the choice of the student</i>			252	4,7	7,0
Master program "Plant quarantine"					
1	Geography of quarantine organisms	3	144	2,7	4,0
2	Ukrainian pests in international phytosanitary	3	108	2,0	3,0
<i>Totally at the choice of the student</i>			252	4,7	7,0
Master program "Methods of entomological control in crop farming and environmental management"					
1	Systematic Quality Analysis of environment Objects and Plant Production	3	144	2,7	4,0
2	Entomological biotechnology	3	144	2,7	4,0
<i>Total selected by the students</i>			288	5,4	8,0
Research oriented disciplines					
Master program "Biological justification of obligate and facultative pathogens control"					
1	Methods for infectious backgrounds forming in phythopathology	3	90	1,7	2,5
2	Pathogenesis in plant production	3	90	1,7	2,5
3	Pathological process of plants' root system	3	72	1,3	2,0
<i>Total selected by the students</i>			252	4,7	7,0
Master program "Pest management in agrocenoses"					
1	Theoretical background of technical entomology	3	108	2,0	3,0
2	Epizooties of pests	3	144	2,7	4,0
<i>Total selected by the students</i>			252	4,7	7,0
<i>Total number of elected part</i>			1008	18,6	28,0
<i>Practical training</i>			468	8,7	13,0
<i>Writing and defense of master's thesis</i>			180	3,3	5,0
<i>Total for specialty</i>			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. *Cycle of humanitarian, social and economic training\**

**Business foreign language.** The discipline develops students' skills and abilities of verbal and written communications in accordance to the reasons, aims and social codes of linguistic behavior in typical spheres and situations of English-language intercourse. Practical English training in higher educational establishments aims the development of abilities of professional literature reading, dialogic and monologue speaking; acquaintance with the newest achievements of science, technology, history and economy of Ukraine and other countries.

**Logistic and communication in Plant Protection.** The course is focused at analyze of supply, transpiration and storage of plant protection products with identification factors effecting level of production and sells of microbial products, pesticides and agrochemicals in different regions of Ukraine. The course is a foundation for estimation of plant protection products effective transportation of by mean using logistical models and computer technologies, considering mechanism of synergetic efficient use of compounds in local, regional and state levels.

**Standardization and jurisprudence in plant protection.** Discipline "Standardization and jurisprudence in plant protection", including study thus questions, discusses the main normative documents that regulate effective implementation of various technological operations in the protection plants, the main legal aspects the application of different pesticides in crop production. Compiling the content of courses taken into account the laws of Ukraine on standardization and safety of plant products

#### 1.2. *Cycle of professional and practical training \**

**Managing the number of weeds in agrophytocenoses.** Involves the study of factors that regulate the number of weeds in phytocenoses crops, environmental and economically sound principles of integrated crop protection from weeds.

**Complex systems of crop plant protection against diseases.** Using the newest informational and specialired technologies of plant prection Against diseases. The control of development of diseases of bield, vegetable and bonit crops and grape plantig are.

**Phytofagous insect management.** Phytofagous insect management deals from one side with key agricultural pests and from another side provide foundation for the population dynamic forecast and management (regulation) of phytophagous insects pests which is the important part of crop production technology.

**Civil defence.** Is an effort to protect the state citizens from military attacks.

**Toxicology of Pesticides.** Contents discipline toxicology of pesticides involves voluminous factual material on the rational and environmentally safe use of pesticides in agriculture, given their biological activity and the impact on the environment. We study the mechanism of action of pesticides on pests, crops, mammals, humans and the environment in general.

**Technology of mass rearing of beneficial insects.** The course deals with modern technologies of mass rearing of beneficial insects. Course objective is to teach students about theoretical foundation and technologies of laboratory and mass rearing of useful insects, nematodes and mites that is commercially used in green houses and open fields.

**Epiphytology.** The program provides for familiarization of students with the science of epiphytoties and different protective measures against diseases based on the intense increasing of infection and the interconnection between amount of infectious onset and disease development, to determine an influence of phytosanitation, selection of



disease resistance, fungicides application and their influence on pathological process of limitation and abolition of epiphytoties.

**Crop Seed pathology.** The condition of seed infection, methods of phytopathological examination, ways of decrease of affect and damage of seed; seed pathology of basic groups of cultures, saprotrophic mycobiota of seed.

**Methodology and organization of scientific researches.** Introduction of new varieties and technologies of growing of agricultural crops and application of new facilities of plant protection requires from the specialist not only the proper theoretical knowledge but also knowledge of basic modern methods of experimental business. Taking this into account professional training of specialists in Plant Protection provides: ability of specialist to develop and inculcate the complex systems of plant protection; to use the proper measures on protecting from different kinds of pests.

**Labour protection in plant protection.** It deals with studying of accident prevention at all types of works, which are related to application, transportation, storage of pesticides, and also laws of Ukraine and instructional materials concerning plant protection, as well as social and legal defense of specialists of this industry.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of humanitarian, social and economic training\*

**Economic and organization agricultural service.** This objects economic efficiency of agricultural service in market relations. Future specialists know specification of economic and business relations between agricultural farms and another spheres of agricultural industry.

#### 2.1.2. Cycle of professional and practical training \*

**Biosafety in Plant Protection.** Includes the study of the impact of pesticides on living objects environment, toxicological and hygienic characteristics of chemical classes of pesticides, safety requirements at work, what related with the use of pesticides.

**Disinfestation of Management objects.** Foresees the study of technologies of disinfection of imported vegetable materials and plant products with the purpose of prophylaxis or eliminations of quarantine species while export-import trading operations.

**Methods of plant protectant testing.** The basic theoretical principles, classification of plant protection products, testing and assessment of technical, commercial and economic efficiency of modern pesticides on major crops.

### *Production oriented disciplines*

#### **Master program “Phytomedicine”**

**Ecology of plant pathogens.** Students study basic ecological factors which influence the development of pathogens of agricultural plants; a range of influence of ecological factors on the different types of phytopathogenic organisms; adaptation features of plant pathogens to the action of environment factors; ecological classification of phytopathogenes and their vital strategies; theoretical and practical bases of phytopathogenic organism influence through regulation of environmental factors. On the basis of studying discipline it is important to know the limits of influence of environmental factor on pathogen life-forms; foresee development and spreading of disease and origin of epidemiology; use different measures of the microclimate plants regulations to control the phytopathogenes quantity in agrozenoses; develop the plant protection system depending on the particular condition of environment.

**Diagnostics of plants diseases.** The discipline provides for studying of types of plant diseases according to their symptoms, laying hands on the row of specific methods of diagnostics of plants diseases of different etiology, determination of symptoms of

infectious plants, conduction its inspection in the laboratory conditions, selection pathogens in pure culture, defining their morphological and cultural signs, conduction final identification. All these features make it possible to identify the diagnosis of diseases.

**Mycological and phytopathological research methods.** Studying of the basic research methods used in mycology and plant pathology.

#### **Master program “Phytopathological monitoring and forecasting”**

**Experimental research methods in entomology.** They are lighted up the modern methods of experiment planning, supervision and accounts, as well as making book-marks, carrying out the experiments, peculiarities of statistical treatment of the research results.

**Insect pathology.** Morphological characteristics, pathogenesis and epizootiology of important pathogen species in each major taxonomic group with examples of use in biological control programs and disease mitigation methods. In the laboratory, participants can learn how to identify the pathogen groups by observing the gross pathology of infected insects and to use phase contrast microscopy to observe the isolated pathogens. Laboratory techniques for studying and archiving pathogens were demonstrated and practical training provided.

**Insects ecology.** Is based on the study of influence of the different factors of filament on the regulation of the number of insects, basis morphological and physiological species and means existence.

#### **Master program “Plant quarantine”**

**International phytosanitarian standards.** Discipline studies the types of modern international fitosanitary standards and purposes of their creation, application and use.

**Introductive pests.** Discipline foresees the capture of student knowledge of distribution geography of adventive harmful organisms with the purpose of their identification and express-diagnosis of harmful organisms.

**Quarantine pest risk evaluation.** The harmful organisms of plants can make a risk which is added an estimation. He can be decreased by introduction of the technically grounded fitosanitary measures which will influence minimum on the free trading plants and plants materials.

#### **Master program “Methods of entomological control in crop farming and environmental management”**

**Insect Biocenology** is one of key disciplines required to “Entomology” major. It deals with studding of insect communities, regularity of organization and function of its cenosis and species diversity co-adoption’s forms and correlation in ecological niches of different biomes.

**Methods and technical supply of modern entomological researches** The modern methods of planning of experiment are lighted up, supervision and accounts, also book-marks and carrying out a test and feature of statistical treatment of the got results of researches.

**Photo-sanitary and environmental assessment of project** is the system of measures for evaluation of plant production quality in order to define existence of pests which can cause significant damages to national economy.

#### *Research oriented disciplines*

#### **Master program “Biological justification of obligate and facultative pathogens control”**

**Actinomitsetes diseases of plant.** The study of their biological and ecological features will be instrumental in timely diagnostics of actinomycosis and conducting of

---

protective measures. Monitoring of actinomycetes diseases. Diagnostics of symptoms of actinomycetes diseases, learning methods of agent recovery in pure culture.

**Physiological and biochemical aspects of plant resistance to diseases.** Physiological and biochemical features of plants, which increasing plant immunity to diseases, training with methods of studying anatomical, morphological, physiological, biochemical characteristics of infectious and healthy plants to determine plant resistance to disease.

**Mycotoxicology.** Discipline allows students to analyze the features of toxic substances micromycetes, to characterize toxicogenic ability of phytopathogenic fungi, to justify measures to reduce damage plants, to overtake of method for determining mycotoxins in plant products.

### **Master program “Management of insect amount in the crop agrocenoses”**

**Experimental research methods in entomology.** The modern methods of planning of experiment are lighted up, supervision and accounts, also book-marks and carrying out a test and feature of statistical treatment of the got results of researches.

**Insect physiology.** Insect physiology-is a study of internal and external structure and function of inspiration, extractor, digestion and circulatory systems, immunity reactions of hemicycle, functional organization of nervous system and chemoreceptor, endocrine organs, attractants and repellents and the role of hormones in reproduction and life cycle.

**Technical entomology.** Theoretical and practical skills of creating and controlling of insect culture during selection of initial material and introduction in artificial reproduction condition up to creation of initial population is considered.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical training \**

#### *Production oriented disciplines*

### **Master program “Phytomedicine”**

**Bacteriosis of plants.** In the process of study of discipline it is needed to get skills of disease symptom diagnostics, caused by bacteriosis, modern methods of diagnostics of agents, to overtake the methods of studying pathogens, to analyze of protective measures.

**Use the antagonistic organisms against agents that cause plant diseases.** The program provides student training in one of the ways of biological plant protection, including the use of antagonistic properties of microorganisms against disease pathogens. Considerable attention is paid to the morphological and physiological characteristics of bacteria, fungi, actinomycetes-antagonists harmful microorganisms.

**Methods of identification of plant disease agents.** The discipline provides studying the methods of identification of plant diseases agents, criterions of morphological and biological differences of basic groups of phytopathogenes; theoretical and practical bases of pathogens determination, methods of using results of authentication of phytopathogenes identification.

### **Master program “Phytosanitary monitoring and forecasting”**

**Technical entomology.** Theoretical and practical skills of creating and controlling of insect species during selection of initial material and introduction in artificial reproduction condition up to creation of initial population is considered.

**Insect physiology.** Insect physiology is a study of internal and external structure and function of inspiration, extractor, digestion and circulatory systems, immunity reactions of hemicycle, functional organization of nervous system and chemoreceptor, endocrine organs, attractants and repellents and the role of hormones in reproduction and life cycle.

**Master program “Plant quarantine”**

**Geography of quarantine organisms.** The centers of harmful organism origin and natural-climatic terms of their existence in fitocenosis are studied, as well as possible ways of their settling apart and bringing on the territory of Ukraine.

**Ukrainian pests in international phytosanitary.** Kinds which can be harmful for foreign countries are examined. In the case of their exposure in plant production it is necessary to provide additional treatment.

**Master program “Methods of entomological control in crop farming and environmental management”**

**Systematic Quality Analysis of environment Objects and Plant Production.**

Discipline provides: studying of dynamics of plant production consumer quality changes; studying of the science which gives systematic theoretical and practical grounding of remote sensing; express-analysis of environment object states, influence of different factors on the quality of agricultural production and problems environment protection; development of technologies of primary treatment and plant production concervation which provide the maximum productivity and high quality during its way from field to a consumer.

**Entomological biotechnology.** It deals with modern technologies of rearing and use of beneficial insects in technologies of crop production in open field and in green house.

*Research oriented disciplines*

**Master program “Biological justification of obligate and facultative pathogens control”**

**Methods for infectious backgrounds forming in phythopathology.** Discipline is one of the main training disciplines for plant protection specialists and is based on using of infectious backgrounds in selection of new crop varieties with high resistance to diseases.

**Pathogenesis in plant production.** Discipline explores the main diseases of plant production in the post-harvest period, its loss through effect of pathogenic organisms and influence of external environmental factors on the pathogenic development.

**Pathological process of plants’ root system.** The main purpose of discipline is a study of species composition of the ground pathogens, which cause diseases of plant root system, research of roots pathology symtomatology, methods of their monitoring, establishment of bioenvironmental properties of microorganisms and features of the pathological process at the defeat of plants rootage, development and improvement of measures on the increase of resistance of agricultural crops against ground micromycetes.

**Master program “Pest management in agrocenosises”**

**Theoretical background of technical entomology.** General knowledge of optimisation, typification and standardisation of culture, that has practical value in plant protection is offered for students. Special note is given for studying of theoretical and practical ground of giving to the insect culture definite inherited peculiarities that remain under mass reproduction in working environment.

**Epizooties of pest.** Significance of forecast and modeling of pest amount regulation processes in conditions of artificial provocation or natural pest epizootic is considered.

---

**Master Training  
in specialty “ECOLOGY AND ENVIRONMENTAL PROTECTION”  
branch of knowledge “Natural sciences”**

**Form of training, licensed number of students:**

– full-time 50

– correspondence 50

**Term of study** 1,5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian, English, German

**Qualification of graduates** Ecologist, Academic

**The concept of training**

The graded training of ecologists is realized through the continuous, integrated programs of basic and specific directions and the direction of national administration, including those which are adapted to the level of better world analogues, to the joint or simultaneous training at the universities-partners by means of integration into education and scientific complexes or international university consortiums and consists in the complete higher education qualification obtaining – Ecology Master, Academic (under the basic direction), Standardization, Certification and Quality Specialists, Environmental Management Experts (under specific directions) and Public Officer (under national administration direction).

Creating the Master programs the next possibilities were taken into account: ecological erudition and provision of general ecological constituent training of all professionally interested; representation in education process the social and ecological order for stable development; availability of favorable environment for integration of education, sciences, innovations, academic education informational support; valedictorian competency formation in formation of concepts, strategies, policies and programs of socio-economical and environmentally safe development and conservancy of nature for optimization of life and environment quality indicator on the basis of ecologically oriented administration decisions by means of improvement of education and scientific researches quality; performance assurance of the mechanisms of ecological policy and management on the global, national, regional and local levels.

**Production oriented master program**

***Master program “Ecology and protection of aquatic resources of the agrarian sphere”***

The training provides the study of purification technology and requirements to the quality of the sources of centralized and decentralized water supply; methodology of environmental assessment of the quality of agrarian sphere water resources; ecological certification of water bodies; ecological safety of water ecosystems; means of sustainable utilization and protection of agrarian sphere water resources and the quality control, ecological problems of irrigation and drained farming; formation of land and water ecosystems development and society economical development ecological bases.

**Sphere of graduates employment**

The valedictorians of this Master program are engaged with the protection and regeneration of water ecosystems, the ecologically safe use of water bodies and sources and the carrying out of scientific support in scientific researches, planning and surveying works for resource conserving water use in the sphere of water and land resources eco-

management under the branches of national economy; they contribute to the improvement of general ecological education of the population, in particular, employing for National Agency of water Resources of Ukraine and its structural divisions (basin, regional department of water resources, channels department), Public Enterprise "Water Exploitation" etc.

***Master program "Ecological control in agrarian sphere: monitoring, certification, expertise"***

The training of ecologist, who gain the knowledge of agro-ecological monitoring of agrarian sphere territories; inspector inspections of economic entities, entities of ecological certification of industrial and agricultural enterprises, rural communities, hard domestic waste, land lots, fodder grounds and natural and recreation objects; landscape and ecologic expertise of the agrarian objects and the cultivation of crops technologies.

**Sphere of graduates employment**

The valedictorians activity of this master program concerns the organization, support, performance and observance of ecological control in the agrarian sphere of monitoring, audit, certification, examination for regulation of socio-economical and ecologically safe development of territories and enterprises of the agro-sphere. The places of employment for such valedictorians are the enterprises of the agribusiness industry of different property forms, in particular: LLC "Agrokhimservis"; PE "Agroresursy", LLC Agrarian "Germes", CJSC Stud Farm "Agro Region", LLC "Druzhba-Nova", Kraft Foods Ukraine etc.

**International Master programs of research profession**

***Master program "Environmental quality and system analysis"***

The training of ecologist provides the experience formation about the systemic approach to environmental assessment of land and water ecosystems components; the system analysis of anthropogenically altered agrarian, urban, techno-ecosystems characteristics; the characteristic of the content verity and interconnection between different land and water ecosystems; integrality, functionality, dynamism, energy capacity, self-organization and yielding capacity of natural ecosystems and the modeling of biogenic elements journey in different ecosystems and the influence of the main pollutant on this journey.

**Sphere of graduates employment**

The valedictorians' activity of this master program concerns the ecosystem assessment of economics branches development conservation plans; the provision, prevention and elimination of ecological risks and dangers by anthropogenic load in the transformed socio-natural systems of the field of well-balanced ecosystem exploitation of the anthropogenically altered ecosystems and their management. The places of employment for such valedictorians are the enterprises of different property forms of agro-industrial and nature protection branches, in particular: SPE „Bio-test-laboratory", PE „Ukrainian scientific and research, education centre of standardization, certification and quality problems", Ukrainian laboratory of agribusiness goods quality and safety, etc.

***Master program "Ecological management and policy"***

This program lets to acquire knowledge of the procedures, processes and resources for application of management mutual relations and methods system, for obtained approbation results appraisal, the improvement of conservation managerial decisions; achievement of the ecological policy objectives and solution of the natural

---

resource and ecological problems of different level and kinds of economic activity – from the individual enterprise, manufacturing field to the national, global economics; the system of natural management measures and economic entities ecological strategies, forecasting, prevention and relief of the ecological disturbance consequences; the system of objectives and actions of the regulatory authorities and the management of the oriented guaranties of ecological safety on the different immigration levels and ecological wants satisfaction of people.

### **Sphere of graduates employment**

The valedictorians of this master program assure the evolution and implementation of the public ecological policy and public supervision (monitoring) after the nature environment and non-consumptive use, regeneration and resource conservancy. The employment sphere – public authorities executive establishment, in particular, Ministry of Ecology and Natural Resource, Ministry of Agrarian Policy and Food of Ukraine, Emergency Public Service, Public Ecological Inspection etc.

### **Master program of applied biology specialization “Laboratory work” for expert control sphere of employment**

#### ***Master program “Ethods of natural environments ecological control”***

This Master program provides the study of: regulatory and methodic materials in the branch of activity, ecological standards and norms system, field and laboratory testing methodology, modes of work with lab instruments, laboratory samples, technological procedures and modes of crop production, order, methods and measures of natural environments eco-toxicological control; they will acquire the skills to: perform the methods collection and make the laboratory analysis of natural environments under the declared indexes and safety indicators per the laboratory business line, carry the statistical research data processing, analyze it and make an expert report, size up the influence of ecological factors and technologies on the crop products quality, provide recommendations concerning the quality and safe products release, arrange the performance of scientific and research works and determine its development prospects, carry out the ecological control (monitoring, audit, certification, examination on the territories and objects of economic activity) of the natural and anthropogenic (agrarian, urban, technological) land and water ecosystems, carry out the ecological quality control of the agrarian and forest ecosystems products.

### **Sphere of graduates employment**

The valedictorians of the Master program can employ for specialized laboratories of the public services, oriented on the monitoring of the quality and safety of soil, forage, food stock and food products and the quality of environment. The specialized laboratories of the Public Veterinary Phyto-Corps, Public Enterprise «Ukrainian Public Scientific and Research Centre of Standardization, Metrology, Certification and Consumers protection (Ukrmetrteststandart)», Hygiene and Epidemiological Service of Ukraine, Public Inspection of Agricultural Products Quality Control and Market Monitoring, Customs control require such experts as: ecologist-toxicologist, ecologist-radiologist, engineer of natural ecosystems recreation, environment conservancy engineer.

### **Practical training**

The practical training of the experts is held on the scientific and research farm units of SD of the National University of Life and Environmental Sciences of Ukraine: “Velukosnitynskyi scientific and research farm named after O. V. Muzychenko”, “Scientific and research farm “Vorzel”, “Agronomic research station”, and the Institute of Agroecology

---

**MASTER DEGREE PROGRAMS**

and Ecosystem Exploitation of the NAAS of Ukraine, the Institute of Plant protection of the NAAS of Ukraine, LLC “Svitanok-agrosvit”, Ukrainian Public Scientific and Research Institute “RESURS”, LLC scientific and Production Firm “Agroecosystems Ltd.”.

**Proposed Topics for Master Theses**

1. Ecological certification of different origin and economic use water sources.
2. Assessment of lands appropriateness developing the ecologically safe raw materials zone for production of baby and diet food.
3. Ecological control of soils quality – territories ecological certification.
4. Ecological and hydroeconomic measures for water quality establishment.
5. Ecological management, marketing and audit on the agrarian enterprises.
6. Ecological policy: global, national (public), regional, field, corporative.
7. Water quality ecological assessment of different level occurrence on the farm or production district.
8. General environment impact assessment of the agribusiness enterprises and ecological situations characteristic in agrarian sphere.
9. Environmental approval of the agricultural products and raw materials production technologies.
10. Ecological inspection of the hazardous agrarian enterprises.

**Academic rights of the Master program enrollee**

specialties in the *branch of knowledge 1801 “Specific categories”*:

- 8.18010010 – “Quality, standardization, certification”, Master program “Ecological standardization and certification” (see p. 176);
- 8.18010021 “Pedagogy of Higher School”, Master program “Training method of ecological disciplines cycle” (see p. 434);
- 8.18010018 – “Administrative management”, Master program “Administrative management”, “Business administration” (see p 397);
- 8.18010020 – “Educational institution administration” (see p. 427).

**Curriculum for specialist training of the educational and qualification level  
“Master” in specialty “Ecology and Environmental Protection”**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Civil defense	2	54	1,0	1,5
2	Branch labor protection	2	54	1,0	1,5
3	Higher school pedagogic and psychology	1	36	0,7	1,0
4	Teaching methods at higher school	1	54	1,0	1,5
5	Scientific researches methodology and organization	1	54	1,0	1,5
6	Science and innovation development philosophy	1	54	1,0	1,5
7	Business foreign language	1,2,3	162	3,0	4,5
8	Agrarian, Land and environmental Law	1	36	0,7	1,0
<i>Total number</i>			<i>504</i>	<i>9,4</i>	<i>14,0</i>
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Nature and society stable development strategy	1	108	2,0	3,0
2	Information technologies	2	108	2,0	3,0



**MASTER DEGREE PROGRAMS**

3	Ecological management and audit	1	108	2,0	3,0
4	Ecological standardization and certification	2	108	2,0	3,0
5	World agriculture and food supplies	1	36	0,7	1,0
6	International standardization and certification of technologies, raw materials, final goods	1	36	0,7	1,0
<i>Total number</i>			<b>504</b>	<b>9,4</b>	<b>14,0</b>
<i>1.3. Cycle of professional and practical training *</i>					
1	Ecological policy	1	108	2,0	3,0
<i>Total according to regulatory part</i>			<b>1116</b>	<b>20,8</b>	<b>31,0</b>
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<b>2.2.1. Cycle of professional and practical training *</b>					
1	Ecology systems theory. Environment quality system analysis. Cultivated lands GIS analysis	2	216	4,0	6,0
2	Agricultural radio-ecology	2	144	2,7	4,0
3	Ecological safety problems and ecosystem exploitation actual concepts	2	180	3,3	5,0
4	Intellectual property and world information resources	2	72	1,3	2,0
<i>Total chosen by university</i>			<b>612</b>	<b>11,3</b>	<b>17,0</b>
<b>2.2. Disciplines chosen by students</b>					
<b>1.3. Cycle of professional and practical training *</b>					
<b>2.2.1. Production oriented disciplines</b>					
<b>Master program "Ecology and protection of aquatic resources of the agrarian sphere"</b>					
1	Water quality monitoring in agrarian sphere	3	108	2,0	3,0
2	Disposal of sewage, recovery and neutralization	3	216	4,0	6,0
3	Modern chemical analysis methodology and environmental chemistry	3	216	4,0	6,0
4	Water systems ecological safety	3	108	2,0	3,0
<i>Total selected by the students</i>			<b>648</b>	<b>12,0</b>	<b>18,0</b>
<b>Master program "Ecological control in agrarian sphere: monitoring, certification, expertise"</b>					
1	Agro-ecology	3	216	4,0	6,0
2	Ecological expertise in agriculture (agro-biotechnologies)	3	108	2,0	3,0
3	Agro-ecological control and management (monitoring, certification, management, inspection)	3	216	4,0	6,0
4	Modern biotechnologies and bio-safety	3	108	2,0	3,0
<i>Total selected by the students</i>			<b>648</b>	<b>12,0</b>	<b>18,0</b>
<b>Research oriented disciplines</b>					
<b>Master program "Environmental quality and system analysis: Soils quality and land ecosystem system analysis"</b>					
1	Soils quality monitoring and appraisal	3	216	4,0	6,0
2	Ecological examination in agribusiness	3	108	2,0	3,0
3	Lands ecological monitoring and certification	3	216	4,0	6,0
4	Land resources and polluted lands management	3	108	2,0	3,0
<i>Total selected by the students</i>			<b>648</b>	<b>12,0</b>	<b>18,0</b>
<b>Master program "Environmental quality and system analysis: Water quality and water ecosystems system analysis"</b>					
1	Water ecosystems	3	108	2,0	3,0
2	Hydroecology and hydro ecological researches methods	3	108	2,0	3,0
3	Water ecosystems ecological safety and water quality monitoring	3	216	4,0	6,0
4	Water resources regulation	3	216	4,0	6,0
<i>Total selected by the students</i>			<b>648</b>	<b>12,0</b>	<b>18,0</b>
<b>Master program "Ecological management and policy"</b>					
1	International ecological policy	3	180	3,3	5,0
2	Ecological inspection	3	144	2,7	4,0

## MASTER DEGREE PROGRAMS

3	Public ecological management	3	180	3,3	5,0
4	Polluted lands ecological management	3	144	2,7	4,0
<i>Total selected by the students</i>			<i>648</i>	<i>12,0</i>	<i>18,0</i>
Master program "Methods of natural environments ecological control"					
1	Ecological toxicology, risk assessment and natural management safety	3	144	2,7	4,0
2	Modern ecological researches methodology and technical maintenance	3	144	2,7	4,0
3	Natural environments and plant products quality system analysis	3	144	2,7	4,0
4	Bio- and ecosystems development modeling and forecasting	3	108	2,0	3,0
5	Laboratory science (control and assessment methods of soil and water resources quality)	3	108	2,0	3,0
<i>Total selected by the students</i>			<i>648</i>	<i>12,0</i>	<i>18,0</i>
Total number of elected part			1260	23,3	35,0
Practical training			684	12,0	19,0
Writing and defense of master's thesis			180	3,3	5,0
Total for specialty			3240	60,0	90,0

\* Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### Annotations of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### *1.1. Cycle of humanitarian, social and economic training\**

**Civil defense.** The discipline studies the functions and tasks of a unified state system of prevention and emergency response, protection of subjects of economic activity, provides practical skills for the protection of subjects of economic activity and their surrounding area.

**Work Safety in the industry.** The discipline generates knowledge of theoretical and practical training of students in creating safe working conditions of workers of agro industrial complex.

**Pedagogy and Psychology of high school.** The discipline examines the state, structure and methods of modern psychology and pedagogy, the development of creative personality. Generates knowledge of the principles and patterns of training and education of individuality, psychological characteristics of the formation and development of individuality and of individual psychological characteristics causing a specific personal-social behavior, activities and communication, helps to clarify the motives of human actions, to regulate interpersonal relationships.

**Teaching methodology in higher education.** The discipline provides acquisition of knowledge of the nature of teaching methods and their optimal choice in educational activities. Discloses methods of preparation of lectures and lecturing, giving seminars and workshops. We give a description of the most famous modern teaching methods, recommendations for study and use.

**Methods and organization of scientific studies.** The discipline creates in students a representation of self-creative, scientific thinking and develops the skills of scientific activity, promotes mastery of the latest environmental research methods allowing obtaining the quantitative and qualitative data needed for overall ecological characteristic of objects, processes in the environment leading to the right choice of technology, organizational and administrative decisions, ability to be oriented by the laws and regulations and clearly generate evidence-based conclusions.

**Philosophy of science and innovation.** Philosophical and scientific approaches to the study of science and innovation. Philosophy of science: ontological, gnoseological, epistemological dimension. Forms of organization of science. Classical, non-classical and

postnonclassical ideals of scientism. Methodology of perception of scientific and innovative activity. Study of basic scientific forms. Value of basic and applied research strategies. Philosophical foundations of classification of sciences. Philosophy of technology: theoretical and methodological aspects. Philosophical understanding of scientific worldview. Logic of scientific research in the context of contemporary global issues (environmental, technological and social). Axiological dimension of science: the problem of responsibility of the scientist.

**Foreign language for business communication.** Integrated study of the language professional activity. Types of language activities: reading, listening, speaking. Skills of dialogue and monologue speech, preparing the students for professional communication in a foreign language orally and in writing. Skills of translation of specialized texts as a mean of adequate reproduction of the content of scientific information. Generation of knowledge and skills ensuring the communicative ability necessary for the master's degree in the field of professional communication: in particular, the ability to organize and conduct scientific conference in the specialty, to participate in conferences, to make a scientific report, to hold a business meeting or negotiations with foreign colleagues and partners.

**Agricultural, land and environmental law.** The purpose of the discipline is to explore the regulation of certain types of economic activity of agricultural enterprises and their legal environment as well as Contractual relationship of agricultural business entities, legal regulation of agricultural lands and other natural resources in agriculture in Ukraine. The discipline involves the study of law and state regulation of legal relationship in the field of environment, natural resources and environmental safety and environmental human and civil rights in Ukraine.

#### 1.2. *Cycle of natural science (fundamental) training\**

**Strategy of sustainable development of nature and society.** The discipline generates knowledge of the principles and strategies of sustainable development as a harmonious process that ensures sustainable economic convergence, promotes environmental ecological culture – the preservation of natural resources, ensures the Biosphere space and environmental safety meeting the needs of human life. Learns provisions of practical implementation mechanisms, coordination and harmonization of social, economic and environmental strands of the development of sustainable society in the country, organizes plans and schedules of stages of sustainable development. Promotes mastery and skills of monitoring the indicators of sustainable development, identifies environmental risks and hazards for human development and sustainable development, promotes the use of international agreements and documents related to sustainable development, performance of plans and programs (region, city, town) in the transition to sustainable development in Ukraine and other countries in transition.

**Information Technology.** Mastery of modern information technologies based on knowledge of technical components of computer systems and complex software needed to organize and implement information and perform the research complex in the ecology for processing textual, numerical and graphical information, conducting mathematical analysis of experimental studies and preparing advertising and promotional materials to highlight the research results.

**Environmental Management and Audit.** Environmental Management examines managerial relationships in an institution ensuring its sustainable development, environmental protection, safety of human life, sustainable use of natural resources and environmental safety of the institution and its activity aimed to the implementation of environmental objectives and programs of environmental impact, and creates a knowledge of environmental strategy of social development, management of natural resources and environment-related activity, which are determined by biological and socio-economic characteristics of enterprises, strategic goals of the society and allow the enterprises to

---

survive and achieve their goals in the long run. Environmental audit is a management tool which examines the effectiveness of management in preserving the environment and maintaining competitiveness through ecological production, creates knowledge of systematization, documentation, frequency of objective evaluation of conformity of environmental management, operation of equipment and its conformity with environmental objectives, creates the ability and skills for assessment of environmental regulations and environmental policies of the company.

**Environmental standards and certification.** The discipline examines the system of mandatory functional and environmental requirements for products, technologies, management, is aimed to improving their environmental performance and implementing the system-wide identification for establishing compliance and certification. Provides the ability and skills in management, preparation and development of documents certifying conformity of environmental management of the enterprise to the requirements of standards and additional regulatory documents. Generates knowledge of basic provisions and terminology of the state control on the environment, the current state of the environment in Ukraine and Europe, environmental regulation of control parameters of the environment, methods and means of control of parameters of the environmental objects, transboundary pollution issues, accreditation of laboratories, using interlaboratory comparative trials.

**World agriculture and food resources.** Current state of global agriculture and food resources. Economics of agriculture in the developed countries. Globalization of development and the problem of providing mankind with food. Food and feed capabilities of continents. Food resources of the crop area. Food resources of animal breeding. Food resources of oceans. Food pyramid of human feed. The world market for animal products and trends of development. Forests, their food and feed resources. The world market for fruits, vegetables and sub-tropical food crops. Factors of pricing of agricultural products and food resources in the developed countries. International scientific and technological cooperation in agriculture and food resources.

**International standardization and certification of technologies, raw materials and finished products.** Learning the basic principles of international and regional institutions for standardization and certification of agricultural products, their structures and services, duties and rights, fundamental provisions of international and European legislation in the field of standardization and certification.

### *1.3 Cycle of professional and practical training \**

**Environmental policy.** Examines the documented and officially declared (approved) system of ecological concepts, principles, approaches, priorities and activities, that defines the relationship between the society, the state and the environment, generates knowledge and skills of future leaders in the development of environmental policies, systems of production, management of enterprises and corporations through which the adherence of the administration for environmental priorities shall be demonstrated.

## **2. ELECTIVE ACADEMIC DISCIPLINES**

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training*

**Systems theory in ecology. Systems analysis of environmental quality. GIS analysis of agrolandscapes.** Systems theory in ecology is an interdisciplinary area of scientific research and eco-oriented disciplines that forms knowledge for developing generalized models of natural and anthropogenically-modified systems, constructing logical and methodological conceptual description of functioning and behavior at the ecosystem objects, generating the generalized theories (hypotheses, laws) of ecosystems (land, water - natural and anthropogenic) of different types (agro, urbo-, techno- systems),

---

including the systems dynamic theory of purposeful behavior, genesis, evolution and historical development of the hierarchical structure, the governance processes of systems. System Analysis of the environmental quality examines the set of scientific, educational, industrial (technological) problems, which in their specificity and diversity are similar and are considered as a whole in terms of the object being tested in different types of ecosystems, generates skills for building scenarios of representation of ecosystems and means of the study of objects and their components (description, explanation, interpretation, modeling, prediction, prevention, design, construction). GIS analysis of agrolandscapes examines the foundations of geographic information systems and spatial analysis allowing the use of GIS in ecology for modeling, forecasting and monitoring. The discipline enables using in the manufacture the mechanical and software complex for automated recording, storage, display, analysis, modeling of spatially coordinated information, generates knowledge in collection, analysis and interpretation of geographic information, geographic information monitoring of land, use the GIS for landscape-ecological zoning, provides the skills in determination of the point, line objects and polygons, based on their attributes, using the interpolation methods, principles of classification, making calculations of slopes and slope exposure, providing buffer zones around water bodies, mapping layer blending, cartographic modeling, developing the flowchart of mapping models using GIS for technical and ecological land use, protection, conservation of natural and anthropogenic, terrestrial and aquatic ecosystems and their resources.

**Agricultural Radiology.** The discipline learns concentration and migration of radio nuclides in environmental objects of environment and agricultural production, agricultural environment and their effects on plants, animals and agro-ecosystems as a whole. Generates knowledge of designing the principles for the development of agriculture in the contaminated territories, complex protective measures for ensuring production of agricultural products and raw materials meeting radiological standards, regulations, requirements.

**Problems of ecological safety and optimization of modern concepts of nature.** The discipline generates knowledge about ecologically friendly environment provided by prevention of negative impacts leading to the environmental degradation and risks to human health, the ability to determine the types of environmental safety according to the territorial basis (global international, stat -national, regional, local), according to the means of ensuring: technological, ecological (radiological, socio-ecological, economic and natural environmental safety), according to the objects of the environmental safety: the environment and its components, environmental safety of human and human society; skills of development and introduction of modern concepts of management of natural resources aimed to the protection of the environment and public health. Optimization of management of natural resources. Generates knowledge about the conditions of balanced interaction of human society with all natural biomes of the biosphere. Provides the skills to achieve the effective results in management and obtain maximum economic benefit with minimal damage to the environment, consumption of natural resources and their restoration and protection of the environment from pollution and destruction.

**Intellectual property and global information resources.** The discipline generates knowledge about the latest technologies of the work with information data, study of legal aspects of their use, the use of the modern tools, production of digital content related master's research, information expertise, research expanded database of Internet resources, new approaches to processing the Information data and direction of research, quality of presentation of the results of independent research, legal aspects of copyright law, particularly for the use of Internet resources, protection of intellectual property rights at the national and international level, principles of organization and operation of computer networks, WWW systems and Web 2.0 technologies, composition, structure and principles

---

of the search engines used in the global Internet, the main methods of finding information data, organization and expansion of conventional web search, the main agrarian resources, including FAO resources (electronic and depository libraries, AgroWEB and other Internet resources), concept of digital content formats and their main purpose, including media, formats, office documents, databases, spreadsheets, presentation of the principles of research results through publications, presentations, website, principles of social community and social services of the Internet - blogs, wikis, Geocaching, geographic information systems, principles of creating and using databases, expert systems, data processing using the spreadsheets. Provides the following skills after completing the course: conducting the effective information retrieval, including academic and professional direction, using traditional and electronic sources including the Internet resources, evaluating the resources found online, using professional and scientific information in compliance with the protection of copyright and Intellectual property, make out in compliance with the requirement of the WAC (the State Commission for Academic Degrees and Titles) of Ukraine the links to the Internet resources, experience of work with office applications for registration of research results, including word processors, presentation of packages, spreadsheets and database, using the e-mail, forums, blogs, wikis, geographic information systems, photography and video services to share information and to present the results of research on the net, making the publication of research results in the web-compatible formats; organizing the research work, choosing the best methods and tools for presentation of the results.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training \**

*Production oriented disciplines*

**Master degree program “Ecology and protection of water resources in the agro sphere”**

**Monitoring of water quality in the agricultural domain.** Study of the discipline as a part of the final phase of the master’s degree in the field of ecology and environment, creating the base of scientific outlook on current knowledge in monitoring of water quality. Mastering the techniques of water quality parameters and their evaluation.

**Wastewater treatment, recycling and disposal of the Wastewater.** Formation of theoretical and practical knowledge of the foundations of modern water treatment technologies with a focus on the problem of purification of agricultural wastewater. Examines and sets the composition of wastewater and pollution, physical and chemical foundations of water and wastewater treatment, water purification methods of waste products and the organization of closed water cycles. Related with the prevention and reduction of waste, its collection and transportation, storage, processing, disposal and removal, disposal and burial, as well as preventing negative effects on the environment and human health.

**Methodology of modern chemical analysis.** The main purpose of the study of the theoretical part of methodology of modern chemical analysis is to provide knowledge about modern methods of analytical chemistry of the environment, the methodology of sample preparation for analysis, exploring mathematical processing of the results of chemical analysis, determination of heavy metals in water and soils and learning new techniques methods of environmental assessment.

**Environmental safety of aquatic ecosystems.** Study of environmental issues and general concepts of ecological status of aquatic ecosystems, the main factors of influence on them, sources of pollution, methods of treatment, transboundary sources of pollution, ecological features of small rivers, lakes, wetland ecosystems.

---

**Master Program “Environmental management in the agricultural domain: monitoring, certification, expertise”**

**Agroecology.** Developing the knowledge of the components and importance of the of agro ecology for the development of agro sphere and society, new approaches and methods of ecological safety of agricultural production, ecological agriculture methods, tools of performance and rehabilitation of modern agricultural landscapes, and ensuring the production of environmentally safe products, the main characteristics of the structure, function and types of modern agro-ecosystems, identifying, predicting and simulating the causes and consequences of destabilization, changes of energy and stamina, factors and prospects of stabilization, capturing the strategic direction of the agro sphere features of alternative agriculture, biotechnology and modern agriculture in the agro industrial complex in the world and in Ukraine.

**Environmental impact assessment of agricultural production (ahrobiotechnology).** The discipline generates knowledge and skills on a comprehensive assessment of the impact on natural resources, human health and environmental quality of various innovations (projects of enterprises, buildings, structures, technologies, inventions, standards, materials, products, materials, projects for transforming the nature etc.) across selected areas of the region, and providing skills for pre-verification of compliance with the requirements of environmental protection projects of social and environmental areas, guarantees of environmentally friendly importation of products and technologies, research and management of human impacts on the environment for technology assessment and environmental risks.

**Environmental monitoring and control (monitoring, certification, management, inspection).** The discipline examines features of monitoring systems (observations) natural ecosystems, agricultural lands, urban areas and the formation of agroecological knowledge of database, instructional techniques of quality management of ecosystems, methods for optimal decision-making in the field of management of development of the agro sphere based on environmental laws, allows students-environmentalists acquiring knowledge and skills in the collection, analysis and processing systems, generalized, comprehensive information on the qualitative assessment of the environment and its documentary describing the natural, environmental, social, economic, energy, man-made characteristics of objects of environmental performance, territories, territorial-production complexes and groups, as well as commercial facilities for various purposes, forms the skills of development of evidence-based recommendations for the adoption of environmentally-oriented management solutions.

**Modern biotechnology and biosafety.** Examines the principles and methods of applied areas of environmental science and classical and modern biotechnology processes carried out by the use of living organisms or other biological agents, and are aimed to protecting and restoring the environment damaged by human, maintaining functional stability of the biosphere as a whole or certain components of natural ecosystems.

*Research oriented disciplines*

**Master degree program “Quality and Environmental System Analysis: Quality of Soils and Systematic Analysis of Terrestrial Ecosystems”**

**Monitoring of soil quality and appraisal.** Monitoring of soil quality. Generates knowledge of the following: the goals and objectives of monitoring of soil condition, of soil monitoring in the world, types of monitoring of soil quality (background - standard, production - basic, standard, current, crisis, special, scientifically prognostic) monitoring methodology and its organization, net distribution, international and domestic observation program, the concept of soil quality, methods of analytical works and devices, metrology and standardization of the quality of soil, application of regulations and rules for the

---

analysis of existing laboratories in the EU and Ukraine, mathematical software, automated data collection and processing concerning the ecological state of soils, and the use of automated information systems for control of soil characteristics of land use, erosion hazards and risks, the impact of climatic factors, pollution, irrigation, drainage, acidification, alkalinization, decalcification, dehumanization, expert monetary value of land for the economic market research, Implementation and prospects of soil monitoring in Ukraine, introduction of GIS, development of GIS, computer mapping of soils and their properties, national and international programs for monitoring the soil quality. Ensures the following skills: organizing service of monitoring the direct (immediate) and indirect assessments of soil quality, the use of assessment criteria and regulation of anthropogenic impact on soils, analysis and synthesis mapping data, mapping - creating the cartographic materials; prognostics of soils, development plans and monitoring systems of land resources and strategies of technical and environmental feasibility of using the ecological justification for economic purpose. Assessment of quality of soil. Examines the impact of business activities on soil quality indicators. The aim of the course is to explore the learning methodology of assessment of the quality of soil, environmental assessment of potential indicators and effective fertility, pollution and anthropogenic pressures shaping the quality of land resources. As a result, the student should acquire the ability and skills of modern methods of soil appraisal based on agroecological monitoring of the agricultural lands, establish the level of human impact on land resources, pollution intensity, predict changes in land quality, prevent negative trends, introduce the technologies in practice to restore qualitative properties of soils and their interdependence with the possibilities of obtaining environmentally safe products and raw materials, assess the quality of soils for their basic natural properties that are ongoing.

**Environmental impact assessment in agriculture.** Generates knowledge and skills of comprehensive assessment of the impact on natural resources, human health and environmental quality of various innovations (projects of enterprises, buildings, structures, technologies, inventions, standards, materials, products, materials, designs transform nature etc.) across selected areas of the region, and providing skills for pre-verification of compliance with the requirements of environmental protection projects of social and environmental guarantees of importation of environmentally friendly products and technologies, research and management of human impacts on the environment through the assessment of technology and environmental risks.

**Environmental monitoring and certification of land.** Learns the features of monitoring systems (observations) of natural ecosystems, agricultural lands, urban areas and the formation of agroecological knowledge database, instructional techniques of quality management of ecosystems, methods for optimal decision-making in the management of development of agro sphere based on environmental laws, allows students-environmentalists acquiring knowledge and skills for collecting and analyzing, system design, generalized, comprehensive information on the qualitative assessment of the environment and its documentary describing in accordance with the natural, environmental, social, economic, energy, environmental man-made characteristics of objects, territories, territorial-production complexes and groups, as well as economic objects for different purposes and forms and development of skills of evidence-based recommendations for the adoption of environmentally-oriented management solutions.

**Management of Land Resources and contaminated areas.** Learns the basics of effective use of soil management in accordance with environmental legislation. The aim of the course is to explore the theoretical and practical assimilation of Land Management as a soil biotic complex, which is the basis of agro-ecosystems, the introduction of environmental friendly technologies aimed to restoring the soil fertility, use of intensive, extensive technologies for products and raw materials, and reducing anthropogenic nutrient loading on agroecosystems , implementation and development of alternative

---



("organic") agriculture, land management and reclamation in the dangerous areas due to the erosion. Meeting the relevant agricultural requirements of applicable law, the applicable standards and regulations, standardization, certification, licensing the operation of land for various purposes in agricultural domain.

**Master Degree Program "Quality and Environmental System Analysis: Water Quality and Systematic Analysis of Aquatic Ecosystems"**

**Aquatic Ecosystems.** Generates knowledge of: aquatic ecosystems, their structure and place in the biosphere, trophic structure of the biota of aquatic ecosystems, biological components of aquatic ecosystems - bacteria, viruses, algae and higher aquatic plants, aquatic invertebrates, fish and ichthyoid, abiotic factors of the dynamics of water masses and their role in aquatic ecosystems, groundwater characterization, hydro-physical factors, water and salt content adaptation, hydro-chemical characteristics of water according to the ion-, micro-and macro-component composition, population characteristics of aquatic ecosystems and their biological hydrobiocenoses productivity, human impact on aquatic ecosystems and causing the eutrophication of water bodies, toxic contamination, water quality – environmental and water management approaches to their installation. Provides the skills of toxicometry, the use of evaluation and control of toxic water pollution, use of bioindicators to determine the toxicity of water, adjusting the level of toxic pollution, methods of water quality of various origins and economic purpose, mapping the ecological status of surface waters, ecological certification of water, and other facilities, organization of water supply and sanitation, legal regulation of water management and water protection.

**Hydroecology** and methods of hydroecological research. Studies aquatic ecosystems and their components as an integrated system of interacting living (biotic) and nonliving (abiotic) components patterns of life mainly in supraorganismal levels - population, and biocenotical ecosystem – in close connection with the terms of the aquatic environment and surrounding areas, the interaction of biotic and abiotic components and establishes their role in the functioning of aquatic ecosystems, approaches and methods of biological and other natural processes that occur in an aqueous environment, and examines the impact of human activities on water quality status and functioning of aquatic ecosystems in general as components of the environment. The main purpose of the research and practice is the ways and scientific basis for the measures for the protection of aquatic environment and life in it as a necessary basis of existence of human society and the development of productive forces. Generates skills for observations in nature, study of the species composition of the living population in waters and quantification of certain indicators, chemical analysis of water and sediments, experiments on specific populations and biocenoses ecosystems, skills of laboratory experiments and experiments in natural waters, laboratory and mathematical modeling of water ecosystems, the use of advanced technology. Investigates the physical and chemical components in hydroecology using the methods for determining transparency, nutrient content and organic matter components of salt, active response, dissolved oxygen, specific toxic substances and radiation exposure. Biological methods for assessment of water quality based on the reaction of plankton, benthos, macrophytes and fish to the content in the aquatic environment of chemicals, components of mineral and organic origin. The degree of water pollution can be evaluated by the presence of indicator organisms by comparing the species diversity, abundance and biomass of aquatic populations in contaminated and clean areas. The method of assessment of water quality in species composition, quantitative indices of indicator species and the structure of aquatic communities are called bioindicators. According to the characteristics of aquatic flora and fauna, the quantitative ratios of individual members can be judged on the extent and nature of water pollution and the status of water bodies as a whole. Bioindicators in structure and quantitative indicators of aquatic communities give an indisputable advantage over other

---

methods. Controls the toxicity of rivers, lakes, reservoirs, seas and other bodies of water, pollution with various toxicants, using the method of bioassay.

**Environmental safety of aquatic ecosystems and water monitoring.** Studies environmental issues and general concepts of ecological status of aquatic ecosystems, the main factors of influence on them, sources of pollution, methods of treatment, transboundary sources of pollution, ecological features of small rivers, lakes, wetland ecosystems .

**Regulation of water resource.** Generates the necessary theoretical knowledge to manage water services, priority areas of development and amounts of payment for the use of water resources, ways of interaction between territorial and sectoral subjects of water management, standardization of procedures and processes of management of water basin and water quality, environmental and mechanisms of investment, financing water management and water conservation measures, promoting the rational use and protection of water resources, information and scientific support of management decisions, public participation in addressing the environmental problems of water management basin. Provides the following skills and abilities: to conduct the payments for water use in a particular region and basin, to develop measures of effective water management, to provide information and scientific support of water conservation projects, to create databases environmental and water management information, to predict changes in the quality of water resources.

### **Master degree program “Environmental Management and Policy”**

**International Environmental Policy.** Generates knowledge of the following: systems of international environmental activities, priorities, concepts aimed to ensuring the quality of the environment, restoration of natural resources and creation of appropriate environmental conditions for the life of the world's population, development, implementation and coordination of international – global, national, local control, the implementation of international environmental goals and objectives - administrative, legal, market, information, tools, and techniques of public management of environmental issues. Provides the skills to determine the ecological orientation of individual entities in accordance with their goals, objectives and international interests, to develop environmental combined long-term strategies, fundamental plans, intentions of administration of entities as for the international environmental activities, documented and formally approved design, the corporation documents of intent and principles of leadership and adherence to environmental priorities of international importance, to determine the environmental goals and objectives, taking into account legal requirements, regulations and standards, to ensure access of workers and the public, the international community to environmental information, the development and implementation of agreed international standards strategy of use and protection of natural resources, harmonization of indicators of sustainable development indicators and standards of other countries.

**Environmental inspection.** Generates knowledge of the procedures of the influence of society on the environment, monitoring and evaluation of the impact of economic and social activity in the living environment (air, water, soil), the degree of environmental safety or environmental economic activity of the situation at the sites (areas ), natural resources and human health across particular objects, preventing or stopping the negative impact of certain types of human activities on human health and the environment, mastering the methodology and procedures of state control in the sphere of environmental protection and use of natural resources, monitoring of compliance with environmental legislation, prediction, prevention and establishing the degree of environmental risks and ecological security study conclusions environmental control, environmental inspection entities (individuals and legal entities) of all shapes, forms, basic tasks, functions, structures and rights of Environmental Inspection, the procedure for organizing and

---

conducting environmental inspections, order forms and types of prosecution of violators of international and national environmental legislation. Provides the skills of a comprehensive science-based control certain types of activities in order to determine the degree of environmental risk, the definition of sustainable activity in the course of matching the inspected object to the requirements and standards of environmental legislation, evaluating efficacy study of measures for the protection of the environment; training objective conclusions based on the results of environmental monitoring; clearance acts on the results of inspections and public awareness.

**State Environmental governance.** Generates knowledge about the following: the conscious human impact on the economic and natural objects and processes of the environment and the people associated with it, the implementation of an informative conscious human impact on management facilities – the environment as a set of natural and social conditions and processes, natural resources involved in economic turnover and those that are not used in the national economy, landscape, territory, Protection of areas and health in order to obtain the desired results, the main target areas of environmental governance - healing and stabilization of environmental condition of the State, economic management of natural resources, conservation, restoration of natural potential, reduction of anthropogenic pressure, pollution and formation of ecological security, application of management functions - general, carried out by state legislative, and regulatory bodies and authorized (special), which is held by entities that have special powers for environmental management in accordance with the applicable law. Provides skills development of new mechanisms of modern environmental management, their orientation and subordination concerning the natural mechanisms of biological regulation of the environment, the National Ecological Network; greening the general functions of governance (legislative regulation, forecasting, planning, organization, coordination, approval, monitoring, supervision ) of the National Environmental Partnership, ecological socio-economic development, implementing the principles of sustainable development.

**Environmental management of contaminated areas.** Generates theoretical knowledge and practical skills to study the sources and biological effects of toxic compounds and their migration patterns in landscapes, biological circuits of feeding, action and governance mechanisms aimed to the reduction of their accumulation in agricultural products and raw materials. After completing the course the student should know the following: physical-chemical basis of cooperation and migration of contaminants on biota and society, and the nature of pathological changes. The student should be able to evaluate the content of toxic compounds and the intensity of their involvement in the supply chain, to assess risk and to develop ways to reduce the harmful effects of pollutants on living organisms, basing on modern methods of assessment consistent with applicable regulatory requirements using security areas.

**Master Program “Methods of environmental control of environmental objects”**

**Environmental toxicology, risk assessment and environmental safety** studies the toxic effects of pollutants on ecosystems, populations and organisms, existing environmental problems and radiation threats to the population and territories, existing in the state system of environmental and radiation safety evaluation at all levels - from local to global - the probability of negative changes in the environment caused by anthropogenic or other influence.

**Methodology and technical support for modern environmental the discipline** forms the idea in a student of independent creative, scientific thinking and develops the skills of scientific activity, promotes mastery of the latest ecological research methods and technologies that allow to obtain quantitative and qualitative data needed for whole ecological characteristics of objects, processes environment for finding the right

---

technological, organizational and administrative decisions, forms the ability to navigate the laws and regulations and clearly generate evidence-based conclusions.

**Systematic analysis of the quality of environmental objects and crop production** studies a set of scientific, educational, industrial (technological) problems, which in its specificity and diversity are similar and are considered as a whole in terms of the object to be tested in different types of ecosystems, forming skills constructing scenarios of representation of ecosystems and the methods of research objects and their components (description, explanation, interpretation, modeling, prediction, prevention, design, construction).

**Modeling and prognostics for the development of bio-and ecosystems.** Discipline involves mastering the knowledge in information technology, acquiring skills in information and statistical analysis of indicators of environmental quality, building mathematical models of environmental monitoring, forecasting change ecosystems by models, finding the optimal ways to implement the concept of sustainable ecosystems, basic mathematical modeling in ecology allowing promptly and efficiently implementing the objectives of public administration, considering the likelihood of environmental risk for health and life.

**Methods for monitoring and evaluating the quality of soil and water resources** forms in students the idea of structure and elements of the environment, hydrosphere and lithosphere parameters to be measured and evaluated, methods and instruments for measuring the chemical, physical, mechanical and biological parameters, norms and standards for water quality and soil assessment, nature, objectives, types and methods of environmental monitoring, organizing and monitoring the features of geosphere, skills and abilities: measuring the chemical, physical and mechanical parameters of the environment in the field and laboratory during environmental assessments and examining the aquatic environment and soil, conducting the environmental monitoring, assessing by the results of the measurements and making the appropriate predictions about the state of the environment, use of environmental monitoring data, recommend specific types of monitoring the performance of environmental assessments and examinations territories and objects, predicting the environmental situation on the basis of monitoring data.

---

**Master Training  
in specialty “ENVIRONMENTAL ECOLOGICAL BIOTECHNOLOGY AND  
BIOENERGETICS”  
branch of knowledge “Biotechnology”**

<b>Form of training, licensed number of students:</b>	
– full-time	<b>30</b>
– correspondence	<b>30</b>
<b>Term of study</b>	<b>1,5 years</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian, English</b>
<b>Qualification of graduates</b>	<b>Biotechnologist</b>

**The concept of training**

The aim of studying is mastering the theoretical basis and formation of appropriate practical skills by researching biological objects considering classical and modern scientific approaches, which harmonically combine student’s perception and understanding of biotechnological and ecological directions. Special part allows to master main methods of work with genetic material, which is necessary for preparing high-qualified specialists of branch subdivisions. Practical part allows students to master the use of newest biotechnologies that are based on the use of laws of live nature for creation and realization of the newest systems for agrarian- industrial complex, energetics, light, chemical, mining industries, oil refining complex, quality management of biotechnology products, problems of legislative regulations, management and marketing, problems of biosafety and bioethics.

**Research oriented master program**

***Master program “Alternative energetics”***

Program is aimed at studying the problems of usage of alternative energetics in national economy, principles and processes of accumulation of solar energy, technology of production and usage of various types of biofuel, methods of defining technical-economical and ecological efficiency of sources of energy that are based on biotechnological processes, producing alternative fuel from biological material; studies the problem of possibilities to change from mineral fuels to alternative sources of energy; studies the quality of biofuels (biodiesel, biogas, granulated biofuels etc.), parameters and behavior of machines from their production.

**Spheres of employment of the graduates**

Graduates work on the enterprises of food, chemical and biotechnological industry, in engineering-constructing and projecting organizations, energy plants (biogas, biodiesel) and refining of hard and liquid wastes, postgraduate studies.

***Master program “DNA certification and genome mapping”***

The essence of master’s course lies in the studying of main methods of practical diagnostics and identification of genetically modified organisms in food, mastering the methodology and systems of DNA passport systems of precious agricultural plants with the help of modern biotechnologies and molecular-biological methods. The special part of the program gives an opportunity to master main techniques in the work with genetic material that is necessary for training highly qualified specialists of branch subdivisions.

### **Spheres of employment of the graduates**

Graduates work in the enterprises of ecological and sanitary control, in control-producing and control-analyzing laboratories, centers of product certification, commercial firms, and scientific research institutions on the posts of chief specialist, microbiologist, laboratory manager, senior laboratory assistant, scientific employees, bacteriologist, virologist, mycologist etc., postgraduate studies.

#### ***Master program “Biosafety and bioethics”***

The program is aimed at studying heredity and changeability of organisms with new, technically created features and their expansion and possible consequences for ecobiocenoses; studies the main legislative documents and agreements in the sphere of biosafety that are accepted in Ukraine and the range of other leading countries in the world; ethical aspects and problems of biosafety ethics while manipulating the cells, organs and organisms, principles and mechanisms of manipulating the genomes, achievements of gen engineering and therapy and also a range of modern biotechnologies, their benefit and risks for bioworld of the planet.

### **Spheres of employment of the graduates**

Graduates work in institutions of environmental and health surveillance, in the control of production and control and analytical laboratories, centers of certification, commercial firms, post-graduate studies.

#### **Master program of applied biology specialization “Laboratory work” for expert control sphere of employment**

#### ***Master program “Methods of microbiological and virological monitoring objects of crop growing and environment”***

Master program production specialization “Methods of microbiological and virological monitoring objects of crop growing and environment” plays an important role in the training of biotechnology specialist. Future specialists learn advanced biotechnology and molecular-biological methods of work with genetic material that is necessary for the preparation of highly qualified industrial units. The main goal is the assimilation of the theoretical foundations and the formation of appropriate practical skills in the study of biological objects based on classical and modern scientific approaches.

### **Sphere of graduates employment**

Graduates working in diagnostic laboratories, sanitary-epidemiological stations, application laboratories, laboratories of plant protection on the analysis of food, household chemicals, petroleum products, food industry (laboratory analysis of product quality - confectioneries, beverages factories, breweries, bakeries) ministries – Environmental Safety, Health Protection, Agricultural Policy, Environmental protection.

### **Practical training**

Ukrainian Laboratory of Quality and Safety of Agricultural Products, State Enterprise “Ukrainian Research and Training Center of Standardization, Certification and Quality,” State Scientific Control Institute of Biotechnology and strains of microorganisms, LLC “Agrus”, Ukrainian State Research Institute “Resource”, LLC of “Green Wolf”

### **Proposed Topics for Master Theses**

1. Biotechnology and the use of a biological product Tryhoderminu-R based on new strains of fungi of the genus Trichoderma.

---

**MASTER DEGREE PROGRAMS**

2. Studies of the interaction and use of eubacteria Clostridium new-NT for the treatment of cancer kolorektal-tion in Mus Musculus.
3. Biological and molecular genetic characteristics of the viruses perennial legumes.
4. Development of molecular diagnostic systems for the diagnosis and identification of the virus holeness wood apple.
5. Biotechnological processes and modes of equipment for biological protection of corn in SE NUBiP Ukraine “Agronomic Research Station”.
6. Pathological changes of fungi Pleurotus ostreatus Kumm. under conditions of bacterial infection in biotechnological processes.
7. Molecular genetic characteristics of the viruses of lucerne (Medicago sativa).
8. Biotechnological process of composting of agricultural waste.
9. Molecular genetic polymorphism raspberry varieties Ukrainian selection for DNA markers.
10. Development of molecular diagnostic system for diagnosis and identification of virus Sharkey plum (Plum Pox Virus).

**Academic rights of applicants for a master program**

In addition to the specialty “Environmental biotechnology and bioenergy” applicants with a bachelor of arts in the direction of “Biotechnology” can continue studying specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, Standardization and Certification”, master program “Environmental standardization and certification” (see p. 176 )
- 8.18010021 – “Pedagogy of Higher School”, Master's Program “Teaching Methods cycle courses in biotechnology” (see p.434)
- 8.18010018 – “Administrative Management” (see p.397)
- 8.18010020 – “Management of the institution” (see p.427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Environmental Biotechnology and Bioenergy”**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	54	1,0	1,5
2	Philosophy of science and innovation development	1	54	1,0	1,5
3	Labour Protection in Branch	2	36	0,6	1,0
4	Civil defense	2	36	0,6	1,0
5	Agricultural, land and environmental law	1	36	0,6	1,0
<i>Total number</i>			216	3,8	6,0
<i>1.2. Cycle of natural science (basic) training*</i>					
1	Methods and Research	1	54	1,0	1,5
2	International standards and certification technologies, raw materials and finished goods	1	36	0,6	1,0
3	World agriculture and food resources	1	36	0,6	1,0
4	Strategy of sustainable development of nature and society	1	36	0,6	1,0
<i>Total number</i>			378	7,0	10,5
<i>1.3. Cycle of professional and practical training *</i>					
1	Biological Statistics	3	108	2,0	3,0
2	Applied Genetics with the basics of Cytology	2	108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
3	Modeling and analysis of metabolic processes	2	36	0,6	1,0
4	Biotechnology in agriculture and biotechnology in environmental biotechnologies	2	108	2,0	3,0
5	Ecology Biotechnology	2	108	2,0	3,0
6	Plant Biotechnology	2	108	2,0	3,0
7	Alternative energy: bioenergy and bioenergy conversion	2	144	2,6	4,0
8	Information Technology	2	108	2,0	3,0
9	Applied Ecology	1	108	2,0	3,0
<i>Total number</i>			936	17,3	26,0
Total according to regulatory part			1314	24,3	36,5
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.2.1. Cycle of professional and practical training*					
1	Instrumental methods of analysis	1	108	2,0	3,0
2	Agricultural Radiobiology and Radioecology	1	108	2,0	3,0
3	Regulatory support (standards and certification) biotechnological processes, industries, products, raw materials and biofuels	2	108	2,0	3,0
4	Biosafety	2	108	2,0	3,0
5	Design bioprocess	3	180	3,3	5,0
<i>Total chosen by university</i>			612	11,3	17,0
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training *					
Production oriented disciplines					
Master Programme "Methods of microbiological and virological monitoring objects of crop growing and environment"					
1	Microbiology and Virology in crop production and the environment (section microbiology)	3	108	2,0	3,0
2	Microbiology and Virology in crop and environment (Virology Section)	3	108	2,0	3,0
3	Methodology and technical support modern microbiological and virological studies	3	216	4,0	6,0
4	Molecular Diagnostics and bacteria in the environment	3	108	2,0	3,0
5	System Analysis of environmental quality and crop production	3	108	2,0	3,0
Research oriented disciplines					
Master program "Alternative Energy"					
1	Technology of production and processing of raw materials for bioenergy	3	216	4,0	6,0
2	Technology biodiesel in agriculture	3	108	2,0	3,0
3	Technology of biogas in agriculture	3	216	4,0	6,0
4	Bioconversion of organic waste	3	108	2,0	3,0
Research oriented disciplines					
Master program "DNA-certification and mapping the genome"					
1	Diagnosis and identification of GMO DNA Passport	3	216	4,0	6,0
2	Cell and Molecular Biology	3	108	2,0	3,0
3	Population genetics	3	108	2,0	3,0
4	Genetic Engineering	3	108	2,0	3,0
5	Molecular Virology	3	108	2,0	3,0
Research oriented disciplines					
Master program "Biosafety and Bioethics"					
1	Microclonal plant propagation	3	108	2,0	3,0
2	Technology in vitro in crop growing	3	108	2,0	3,0
3	Biotechnology Biosafety	3	108	2,0	3,0



**MASTER DEGREE PROGRAMS**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
4	Immune Biotechnology	3	108	2,0	3,0
5	Biology of individual	3	108	2,0	3,0
Total for specialty			648	12,0	18,0
Total number of elected part			1260	23,3	35,0
Writing and defense of master's thesis			486	9,0	13,5
<i>Total selected by the students</i>			180	3,3	5,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of humanitarian, social and economic training\**

**Business foreign language.** Formation of professional and communicative (linguistic, sociolinguistic and pragmatic) competence of masters to ensure their effective communication in academic and professional environments.

**Philosophy of science and innovation.** Studying the specifics of the philosophy of science and innovation development as a special type of human knowledge and as an academic discipline. The main stages of the historical development of the major trends and methodological techniques solve the main problems of philosophy of science based on the comparative characteristics of classical and nonclassical are considered. Postnonclassical ideals of scholarship. Studying ontological, epistemological, epistemological, methodological, structural and organizational, ideological, moral values and principles of measurement philosophy of science. Philosophical analysis of specific current state of Ukrainian and world science, the prospects for their development and interaction with other spheres of social life, and basic problems of biology and ecology.

**Labour Protection in the industry.** The problems of implementation of safety management for agricultural enterprises, the certification of workplaces on working conditions, investigating accidents and occupational diseases in the field of agriculture, the main responsibilities of safety officers agricultural enterprises. Analysis of dangerous and harmful factors of production environment to prevent accidents, injuries, occupational diseases of workers in enterprises of biotechnological profile.

**Civil defense.** Examining the functions and tasks of a unified state system of prevention and emergency response, protection of economic activity, providing practical skills for the securing of economic activity and its surrounding area.

**Agricultural, land and environmental law.** The purpose of discipline is to explore the regulation of certain types of economic activity of agricultural enterprises and their legal environment and contracts agricultural business management, legal regulation of agricultural land and other natural resources in agriculture in Ukraine.

##### *1.2. Cycle of natural science (basic) training\**

**Methods and research.** Modern methods of environmental and biotechnological research. Discipline creates a picture in a student's self-creative, scientific thinking and develop the skills of scientific activity, promotes mastery of the latest environmental and biotechnological research methods that allow to obtain quantitative and qualitative data needed to general economical and biotechnological characteristics of objects, processes of environmental, ability to navigate in laws and regulations and clearly generate evidence-based conclusions.

**International standardization and certification technologies, raw materials and finished products.** Studying the basic principles of international and regional

organizations for standardization and certification of agricultural products (180, RAO, etc.), their structures and services, duties and rights, fundamental provisions of international and European legislation in the field of standardization and certification.

**World agriculture and food resources.** Economics of agriculture in developed countries. Globalization of the world and the problem of human food. Food and feed capabilities continents. Food resources of crop and livestock sector. Food of animal resources sector oceans. Food pyramid nutrition. The world market for crop production, animal husbandry and its trends. Features pricing of agricultural products and food resources in developed countries. International scientific and technological cooperation in agriculture and food resources.

**Strategy of sustainable development of nature and society.** Studying provision of practical implementation mechanisms, coordination and harmonization of social, economic and environmental sustainable society in the country, organizes plans and timing of stages of the objectives of sustainable development. It promotes mastery and skills monitoring of indicators of sustainable development, identifying environmental risks and hazards for human development and sustainable development, the use of international agreements and documents related to sustainable development, developing plans and programs (region, city, town) in the transition to sustainable development of Ukraine and other countries in transition economy.

### *1.3.Cycle of professional and practical training \**

**Biological statistics.** Generates knowledge of basic methods of statistical data Math. Providing the skills of mathematical processing of the results of research, graphics.

**Applied Genetics with the basics of Cytology** Mechanisms of destruction of the biosphere, methods and techniques of environmental management. Geotechnological, socialeconomical technological ecological and environmental research, the specific relations between organisms and the environment they exist in different geographical areas. Features of natural resources, development of environmental regulations and technical means of environmental protection, restoration of destroyed ecosystems.

**Modeling and analysis of metabolic processes.** Metabolism of various organisms, energy and constructive metabolism, anabolism, amfibolizm, catabolism and metabolism. Particular attention is paid to the cell membranes and their permeability, cell organelles and their interconversion, DNA metabolitsi, metabolitsi and breeding. Coordination of biochemical and biophysical processes of reproduction, growth and development of cells, modeling and creating organisms with new metabolic properties.

**Biotechnology in agriculture and biotekhnology in environmental biotechnologies.** The use of non-waste technologies and processes in agriculture, rational use of organic fertilizers, silage, feed additives, amino acids, enzymes, growth regulators, biological products, plant protection against pests without breaking agocenosis. Biotechnological processes in ecosystems that are created during the growth of environmentally friendly crop production are explained.

**Environmental biotechnology.** Biotransformation, biodegradation bioavailability of major biochemical pathways of microbiological transformation of organic xenobiotics and genetic bases of creation of recombinant microorganisms, degradation of organic xenobiotics, pollutants biodegradation of inorganic nature, natural or synthetic polymeric materials, environments, anaerobic biological treatment, systems design and construction of anaerobic biological treatment, bioremediation soil bioremediation «in situ», «off site», Biological removal of heavy metals and radionuclides, phytoremediation, biological purification and deodorization gas-emission microbiological processing of organic waste.

**Plant Biotechnology.** Studying basic directions and prospects of plant biotechnology, object and methods of biotechnology, culture of isolated cells and tissues, callus and suspension cultures, microclonal plant propagation and recovery from viral

infections, morphogenesis and regeneration of plants under in vitro (organogenesis, embryogenesis), selection of plants under in vitro, cellular and genetic engineering methods for creating transgenic plants.

**Alternative energy: bioenergy and bioenergetical conversion.** Classification and properties of fuels, the essence of the process of burning fuels, technologies and technical means to bring solid biofuels to a condition ready for burning, especially the use of different types of biofuels, their advantages and disadvantages. Technical means for combustion of solid biofuels and biofuel pelletizing, control of key process parameters biodiesel installation, maintenance and repair of equipment for the production of biodiesel, granules and pellets.

**Information Technology.** Mastering the art information technology based on knowledge of technical components of computer systems and required complex software to organize and implement information and research complex in ecology and biotechnology for processing textual, numerical and graphical information, conduct mathematical analysis of experimental studies, as well as preparation of advertising and promotional materials to highlight the research results, methods of mathematical models of the major abiotic and biotic processes, use of basic elementary functions and their combinations for constructing models.

**Applied Ecology.** The mechanisms of destruction of the biosphere, methods and techniques of environmental management. Geotechnological, technosocial economical and environmental research, the specific relationships of organisms and the environment they exist in different geographical areas. Features of natural resources, development of environmental regulations and technical means of environmental protection, restoration of destroyed ecosystems.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional and practical*

**Instrumental methods of analysis.** Studying the basic theoretical principles underlying physical, chemical and visual instrumental systematic study of biological objects in vitro and in vivo. Studying the basic techniques of electrophoresis, chromatography, colorimetry and spectrophotometry, the technique works on light, fluorescent, confocal and electron microscopes.

**Agricultural Radiobiology and Radioecology.** The general question of supply and migration of radionuclides in the environment and agriculture. The basics of specific sectors of agricultural production in the contaminated territories, technological methods of treatment of crop production and animal husbandry of radionuclides are considered. Studying the methodology of radiation monitoring in agricultural production.

**Regulatory support (standards and certification) biotechnological processes, industries, products, raw materials and biofuels).** Studying the principles and methods of technical regulation and its components: standardization, conformity assessment, metrology, requirements for EN, TR, GATS and their place in the world of modern regulations, the requirements of the Directives mandatory for the European market requirements for safety and quality certified quality system of manufacturers, quality indicators to measure them using all the methods of measurement to determine the products in low concentrations of GMO, ways and problems of harmonization of Ukrainian standardization system and certification in the field of biotechnology with international rules and regulations.

**Biosafety.** We study the heredity and variation of organisms with artificially created new features, as well as their distribution and possible consequences for ekobiocenoses.

**Bioprocess design.** Studying the techniques of designing biotechnological equipment and techniques needed to master the development and introduction of new bioprocess.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training \**

*Production oriented disciplines*

**Master Programme “Methods of microbiological and virological monitoring objects of crop growing and environment”**

**Microbiology and Virology in crop growing and the environment.** Studying methods of diagnosis and identification of viruses by biological testing, electron microscopy, immunoassay, a virus-free planting material multiplication method microclonal, the main group of viruses that circulated in biocommunity of Ukraine.

**Methodology and technical support of modern microbiological and virological studies.** Studying kinetic, biochemical (enzymatic and immunochemical) and biological methods used in chemical analysis of different options these methods in the analysis of different nature and composition of objects. Acquired in the course of expertise and ability to allow qualified specialist using methods based on measuring the reaction rate to determine the components of the test object according to the task, to evaluate the feasibility and effectiveness of their use.

**Molecular diagnostics and bacteria in the environment.** The main goal is the assimilation of the theoretical foundations and the formation of appropriate practical skills in the study of biological objects based on classical and modern scientific approaches. Special part of the discipline makes it possible to learn basic techniques in working with genetic material that is necessary for the preparation of highly qualified industrial units.

**Systems analysis of environmental quality and crop production.** The main goal is to develop competencies aimed at the ability to use technical means to measure basic parameters of technological processes, properties of materials, quality of finished biological products, organize and implement the process of production, skills of organization and carrying out the production process, the ability to use regulatory, technical, technological documentation in terms of production.

*Research oriented disciplines*

**Master program “Alternative Energy”**

**Technology of production and processing of raw materials for bioenergy.** The purpose of this course is mastering the theoretical foundations and development of practical skills of students for further research and development of technology solutions using biotechnology operations in designing and establishing energy plantations biological energy crop rotation systems and energy phytomass on the conditions of a particular farm or agricultural landscapes.

**Technology biodiesel production in agriculture.** The discipline involves the examination of the full cycle of biodiesel, basic structure and principles of diesel engines and fuel the parameters that affect the quality of the diesel engine. The basic types of biodiesel, their advantages and disadvantages, raw materials and their possible production in Ukraine.

**Biogas technology in agriculture.** The discipline involves the examination of the full cycle of biogas production, raw materials and microbiological bases its education technology and hardware, storage and purification of biogas production and use of other gaseous biofuels: biowater, generator and pyrolysis gases.

**Bioconversion of organic waste.** Bioconversion of organic waste is one of the most advanced, cost-effective and environmentally acceptable solutions to prevent pollution of the environment. Biological waste treatment aims: the degradation of organic

---

waste and renovation resource to return them to the circulation of substances. Bioconversion of waste of different origins allows to obtain useful products - energy, biogas, organic fertilizer, organic acids, industrially important enzymes, etc.

*Research oriented disciplines*

**Master program “DNA certification and mapping the genome”**

**Diagnosis and identification of GMO, DNA certification.** The main purpose of discipline is the assimilation of theoretical foundations and practical formation of appropriate skills in the study of biological objects and genetically modified organisms, genotyping methods and techniques of agricultural plants and their DNA certification in accordance with modern scientific approaches, harmoniously combining the perception and understanding of practical and theoretical environmental knowledge for students and ecobiotechnological direction.

**Cellular and molecular biology.** The purpose of this course is to familiarize students with the current state of research and practical application fields of the discipline, course Objective is to build students' understanding of the unity of biological systems, resulting in structural and chemical similarities organization, and fundamental molecular processes that distinguish them from inanimate objects. Particular attention is given to mechanisms that ensure the preservation and realization of genetic information in the cell is the basic structure of any organism.

**Population genetics.** Discipline program provides an opportunity for students to expand knowledge and practical skills in basic and applied aspects of population genetics. Main topics of lectures and workshops include the study of population structure, variability of traits in plants, humans and animals, factors that alter the genetic structure of populations, natural selection, population genetics of modern methods used in agriculture, scientific research, biotechnology, ecology, medicine and genetic engineering.

**Genetic Engineering.** The purpose of this course is to familiarize students with current trends and challenges of genetic engineering methods of producing genetically modified organisms. Course description: creates a knowledge of methods of cloning DNA fragments structural features vectors from prokaryotes and eukaryotes, creating libraries genomes, restriction maps, obtaining drugs, obtaining transgenic plants and animals. As a result, the discipline master should be able to based on the latest achievements using the guidelines, plan and choose the optimal conditions for transformation of recombinant DNA and genetic material.

**Molecular virology.** The acquisition of the teoretical foundations and practical skills appropriate formation in the study of biological objects based on classical and modern scientific approaches. Special part of the discipline makes it possible to learn the basic techniques of working with infectious materials, create diagnostic test kits for the identification of viruses, the diagnosis, identification of viruses using molecular biology techniques, to carry out genetic manipulation of viruses analyze genetic sequences and trace phylogenetic relationships, the need for training highly qualified specialists biotechnological areas.

*Research specialization*

**Master program “Biosafety and Bioethics”**

**Microclonal propagation of plants.** Studying theoretical and practical aspects microclonal propagation of plants under in vitro, namely the principles and theoretical basis of preparation of culture media, the effect of growth regulators on the growth and development of plants, the physiological basis of morphogenesis, method and technique microclonal reproduction phenomenon of apical dominance. Attention is focused on microclonal propagation of herbaceous and woody plants (growing of tropical and subtropical plants, technical, cereal, vegetable, fruit, berry and tree crops).

---

**In vitro technologies in crop production.** The purpose of this course is to familiarize students with the principles of the use of biological knowledge in the production of valuable products virtually and gain an understanding of modern biotechnological processes based on genetic and cellular engineering.

**Biotechnologies Biosafety.** Provides fundamental knowledge and practical aspects of ecological biotechnology industry, domestic and international legislation on biosafety biotechnology industries, the concept of the basic principles of design and selection of producers of biotechnology, biotechnological aspects of bakery, dairy, meat, alcohol, yeast, sugar, malt, beer and drinks.

**Immune biotechnology.** Masters get fundamental knowledge in immunology and immunochemistry, get acquainted with the latest developments in the field of science and technology for development of immunological products – vaccines, immunoglobulins, serum diagnostics including the use of genetic engineering. Get knowledge about methods of state control safety and quality of immunological agents. Special part involves mastering molecular genetic and immunochemical methods of analysis and purification method for obtaining biopolymers, for example proteins and nucleic acids.

**Biology of individual development.** The course focuses on the study of genetic information during ontogeny. During the course students are introduced to morphological aspects of development, as well as biochemical and molecular genetic mechanisms that accompany them during embryonic and postnatal development. Particular attention is paid to the molecular-genetic aspects of the determination and differentiation of cells and their stability during ontogeny.

---

**EDUCATION AND RESEARCH INSTITUTE OF  
LIVESTOCK SCIENCE AND WATER BIORESOURCES**

**Director** – Dzitsyuk Valentina Valentinivna, Doctor of Agricultural Science, Senior Researcher

**Tel.:** (044) 527-82-58

**E-mail:** director\_nnitvb@ukr.net

**Location:** Building № 1 Room 34a

**FACULTY OF PRODUCTION AND PROCESSING OF ANIMAL PRODUCTS**

**Dean** – Seba Mykola Vasiliovich, Associated Professor, Candidate of Agricultural Science

**Tel.:** (044) 527-83-95

**E-mail:** nikolay\_seba@ukr.net

**Location:** Building № 1, Room 35

The faculty organizes and coordinates the educational process of bachelors in specialty:

**8.09010201 – “Technologies of production and processing of livestock products”**

Graduate degree is awarded by the following departments:

**M.A. Kravchenko Department of Animal Genetics, Breeding and Reproductive Biotechnology**

**Tel.:** (044) 527-82-30

**E-mail:** krozgen@ukr.net

**Head of Department** - Dzitsyuk Valentina Valentinivna, Doctor of Agricultural Science, Senior Researcher

**Department of Milk, Beef and Pork Production Technology**

**Tel.:** (044) 527-83-93, (044) 527-82-32

**E-mail:** ugnivenko@i.ua

**Head of Department** – Ugnivenko Anatoly Mykolaiovich, Professor, Doctor of Agricultural Science

**Professor P.D. Pshenichniy Department of Animal Nutrition and Feed Technology**

**Tel.:** (044) 527-85-55

**E-mail:** otchenashko@rambler.ru

**Acting Head of Department** - Otchenashko Vladimir Vitaliyovich, Doctor of Agricultural Science

**Department of Horse Breeding, Livestock and Animal Breeding Economics**

**Tel.:** (044) 527-82-68

**E-mail:** horse\_chair@twin.nauu.kiev.ua

**Head of Department** - Skotsyk Vitaly Yevstafiyovych, Candidate of Agricultural Sciences, Doctor of Economics

**Department of Poultry and Small Livestock**

**Tel.:** (044) 527-87-60, 527-84-78, 527-88-49

**E-mail:** NatPP@meta.ua

**Acting Head of Department** - Ponomarenko Natalia Pavlivna, Associate Professor, Doctor of Agricultural Science.

---

**V.A. Nestervodsky Department of Apiculture**

**Tel.: (044) 527-80-71**

**E-mail: k\_pchela@ukr.net**

**Acting Head of Department** - Losev Olexiy Mikhailovich, Associate Professor,  
Candidate of Agricultural Science

**FACULTY OF FISHERIES**

**Dean** – Kondratiuk Vadim Mikolayovich, Associated Professor, Candidate of  
Agricultural Science

**Tel.: (044) 527-85-56**

**E-mail: vadkondratyk@rambler.ru**

**Location: Building № 1, Room. 80**

The faculty organizes and coordinates the educational process of bachelors  
in specialty:

**8.09020101 “Water Bioresources”**

Graduate degree is awarded by the following departments:

**Department of Aquaculture**

**Tel.: (044) 527-89-65**

**E-mail: aqua\_chair@twin.nauu.kiev.ua**

**Head of Department** – Vovk Nadiya Illivna, Professor, Doctor of Agricultural  
Science,

**Department of Hydrobiology**

**Tel.: (044) 527-83-10**

**E-mail: gidrobio@ukr.net**

**Head of Department** – Yevtushenko Mykola Yuriyovich, Professor, Doctor of  
Biological Science,

**Department of General zoology and Ichthyology**

**Tel.: (044) 527-86-83**

**E-mail: shevchenko.petr@gmail.com**

**Head of Department** – Shevchenko Petro Grigorievich, Associated Professor,  
Candidate of Biological Science,

---



**Master Training**  
**in specialty “TECHNOLOGY OF PRODUCTION AND PROCESSING OF LIVESTOCK**  
**PRODUCTS”**  
**Branch of knowledge “Agriculture and Forestry”**

**Form of training, licensed number of students:**

– full-time **90**  
 – correspondence **90**

**Term of study** **1.5 years**

**Credits** **90 ECTS**

**Language of teaching** **Ukrainian Language**

**Qualification of graduates** **livestock products research engineer**

**The concept of training**

The concept of Master degree training level with major in “Technology of production and processing of livestock products” is to have combined theoretical studies, practical training and research to build professional skills in modern energy-saving technologies of high-quality animal products.

The aim of the concept is to satisfy the need for professionals possessing systematic knowledge and ability to solve problems of innovative nature in the livestock industry; scientific basis of research, data acquisition and data statistical analysis; forecasting animal productivity, ability to use inbreeding, improve and create animal branches and species, preserve the gene pool, develop animal breeding programs; design animal feeding trials; be able to analyze, organize and process scientific information on standardized animal feeding; develop and introduce new animal husbandry systems and methods; control physical, chemical and biological environmental factors; perform testing and sanitary-hygienic evaluation of new fodder varieties and additives, processing equipment, animal care products and study their behavior to obtain from them the maximum number of products in terms of their genetic potential; develop various models of technological livestock production processes; analyze populations, species and types of farm animals, determine their and commercial value by origin, individual qualities and progeny; optimize livestock breeding programs; manage milk production of cows based on deep knowledge of lactation physiology, dairy cattle husbandry, specifics of feeding high production cows, processing equipment of dairy companies and intensive technologies of breeding of young cattle stock, management and marketing principles of dairy farming; stimulate egg production of poultry, sheep wool production, yield of bee families, meat productivity of cattle, pigs, chickens and other farm animals; know how to use milk stimulants; manage meat productivity of cattle under market conditions of the industry based on a profound knowledge of beef cattle biology, husbandry and feeding systems, features of breeding environmentally friendly beef; develop competitive pig production and processing technologies; be able to maintain the modern production process and primary processing of table eggs and poultry meat, poultry marketing system; manage processes of procuring voluminous forage, preparation of animal feed and feed additives and know methods of their effective use to feed ruminants and monogastric animals; estimate and predict efficiency of farm animals, evaluate genetic resources in the riding, trotting and draft horse breeding, their rational use in the racing industry, equestrian sport and non-traditional horse breeding, possess the skills of implementing modern methods of experimental studies.

## **Production oriented master program**

### ***Master Degree Program “Animal Genetic Resources”***

The main objective of the master program is to train specialists in animal breeding who are able to work in the Agency for Animal Identification at the Ministry of Agrarian Policy of Ukraine or its regional branches, in the Chief State Breeding Inspectorate of the Ministry of Agrarian Policy of Ukraine or its regional branches, in research institutions, in breeding farms dealing in setting up, improvement or breeding dairy, dual-purpose and beef cattle, pigs, sheep, goats, poultry and horses.

#### **Sphere of graduates employment**

Upon completion of the master's degree program, the managers/ specialists licensed to produce and process, improve and develop animal products can work in public and private breeding farms, provincial and district departments of agriculture, agriculture breeding centers of different levels, as heads of agricultural enterprises and also in higher educational institutions of I-II accreditation levels and in academic schools.

### ***Master Degree Program “Animal Feeding”***

The program aims to provide future research engineers with current knowledge and skills in procuring voluminous forage, preparing fodder and feed additives and getting acquainted with methods of their effective use to feed ruminants and monogastric animals. The program is aimed at learning the basic aspects of performing animal feeding trials, systematization and analysis of scientific information and research results, which presumes knowledge in the following areas that define specialization of the master's programs: animal nutrition, feed resources in animal breeding; feeding of ruminant animals; feeding of monogastric animals; planning of trials and experiments. Studying of these sections contributes to solving practical problems related to production and processing of high quality and biologically safe animal products and to effectively using the acquired knowledge in professional activities to generate new innovative knowledge in animal feed area.

#### **Sphere of graduates employment**

After completion of the master's program the specialists/ managers can work in production livestock and animal feed industries and companies, in feed and feed additives distributor companies, at NAAS of Ukraine's research institutions and apply for the post-graduate studies in graduate schools.

### ***Master Degree Program “Dairy cattle breeding”***

This program provides students with modern deep knowledge of dairy cattle breeding under industry market conditions.

#### **Sphere of graduates employment**

After completion of the master's program the specialists/ managers can work in livestock production enterprises of different ownership forms, at II level of accreditation higher education institutions, NAAS of Ukraine's research institutions and apply for the post-graduate studies in graduate schools.

### ***Master Degree Program “Production and processing of pig breeding products”***

The master's degree program considers the issues related to development of body systems and organs during ontogenesis, characteristics of gestation, generative processes, lactation and energy metabolism and thermoregulation in pigs; breeding biology; behavior of different gender and age groups; adaptation to the environment. The

---

students also examine the issues of animal herding and selection, pure breeding and crossbreeding methods, hybridization and large-scale breeding; methods and ways of identifying estrus cycle in sows; breeding boars and sows; exploitation of breeding boars, methods of obtaining and preparing boar semen, artificial insemination.

#### **Sphere of graduates employment**

After having successfully completed the master's degree program, the specialists licensed to produce and process, improve and develop animal products can apply for employment with livestock production enterprises of different ownership forms, at higher education institutions of I and II accreditation levels, NAAS of Ukraine's research institutions as well as apply for the post-graduate studies in graduate schools.

#### ***Master Degree Program "Poultry breeding"***

The master's degree program provides students with the opportunity to obtain knowledge in biology of chickens, turkeys, ducks, geese, quail, guinea fowl, ostriches and morphophysiological patterns observed in growth of different bird species and to acquire skills of poultry breeding, egg incubation, feeding poultry and egg and poultry meat production by using modern technology and latest equipment, subject to strict observation of veterinary and sanitary measures and quality control through current poultry husbandry management system.

#### **Sphere of graduates employment**

After having successfully completed the master's degree program, the professionals can apply for employment with poultry breeding enterprises of different ownership forms, poultry incubation stations, poultry farms, animal feed mills, in the higher educational institutions of I-II accreditation levels, research institutions as well as apply for the post-graduate studies in graduate schools.

#### ***Master's Degree Program "Equine husbandry and breeding"***

The master's degree program provides specialist with knowledge in the field of breeding and feeding horses of various breeds and is aimed at studying racing industry, sports, organization of small and medium-sized businesses in the context of the industry's future development.

#### **Sphere of graduates employment**

After having successfully completed the master's degree program, the specialists can apply for employment with public and private breeding enterprises, zonal research institutes and stations, at racetracks and in equestrian centers, tourist bases and medical centers and may also apply for and attend graduate school.

#### ***Master Degree Program «Apiculture»***

The program focuses on studies in biology of bee colonies, basics of honey bee genetics, selection work in apiculture industry, bee breeding, breeding of queen bees and inseminating them to use breeding material for increasing productivity of bees and entomophile crops through their pollination. The students enlisted in this program acquire deep knowledge in assessing nectar resources and ability to efficiently use them for improvement of honey harvest and various bee products, effectively use bees for pollination of crops. They will be able to introduce mechanization in bee production processes, know how to handle tools, equipment and automation means to maintain and reproduce bee colonies and reproduce breeding material; operate apiculture facilities. The students under this program will also acquire extensive knowledge about origins, composition, properties and processes of apiculture products and their manufacture,

---

processing and storage processes, standardization and implementation in accordance with market needs.

### **Sphere of graduates employment**

After having successfully completed the master's degree program, the specialists can apply for employment with the leading bee-breeding enterprises, NAS and NAAS of Ukraine's scientific research institutions.

### **Master program of applied biology specialization "Laboratory work" for expert control sphere of employment**

#### **Master Degree Program "Methods of biochemical research"**

The main objective of the master's degree program is to teach master degree students to apply advanced biochemical, physicochemical and molecular biological research methods and effectively use them at work. The objective of this training is to staff specialized laboratories with qualified experts in the field of quality control and safety of agricultural products, food and environmental objects.

### **Sphere of graduates employment**

After having successfully completed the master's degree program, the specialists will be able to apply for employment with specialized veterinary laboratories, diagnostic centers, environmental monitoring laboratories, analytical laboratories of enterprises dealing in production, processing, storage and marketing of agricultural and food products.

### **Practical training**

The aim of practical training is to provide students with knowledge in modern methods, organization forms and tools they can use in their future profession, make them build knowledge and skills based on the knowledge base they have acquired in the University sufficient to make independent decisions in specific lines of work under real market conditions, educate in them the need for regularly replenishing their knowledge and applying it in practice.

Practical training is continuous and consistent and the students undergoing this it obtain the desired scope of practical knowledge and skills as required by qualification of the master's degree.

The main objective of practical training is to consolidate and expand students' theoretical knowledge and their practical skills in organization and management of basic agricultural production processes, and in scientific research.

While studying at the University, the students receive profound theoretical and practical training in modern laboratories equipped with new equipment, computer classes, as well as at the leading animal breeding enterprises, such as IP NUBiP of Ukraine "Agronomic Research Station," "O. Muzychenko Velykosnitynske NDH," "NDH Vorzel," SP "South Crimean Sheep Breeding," PE "Borodino-A," FE "Merino-Zahid," pig breeding complex "Agroprime," AASO Agrokombinat "Kalita", JSC "Agro-Soyuz," Dibrovsky Stud Farm 62, Stud Farm "Shakhtar", JV "NIBULON," FE "Nina," FE "Medovi Polia," Pedigree Bee Breeding Farm "Pribuzki Medobory," JSC "Med Podillia," JSC "Poultry Farm Kiyvska," JSC "Nadia," SE "Nova Peremoha," CJSC "Complex Agromars" and others.

### **Proposed Topics for Master Theses**

1. Optimization of cattle feeding techniques.
  2. Improvement of replacement heifer nutrition.
  3. Productiveness of quails at different levels of fat in feed.
  4. Growth and utilization of feed nutrients in rabbits at different levels of fiber in their diet.
-

## MASTER DEGREE PROGRAMS

5. Effective use of enzymes in poultry nutrition.
6. Improvement of compound feed and premixes' recipes to ensure adequate nutrition of pigs.
7. Better exploitation of sows in conditions of using industrial technologies.
8. Comparative evaluation of performance exhibited by pigs of different genotypes in conditions of using industrial technologies.
9. Effect produced by milk production level on cow reproductive abilities.
10. Assessment of individual cow behavior elements during their milking with milking robots.

### Academic rights of applicants for a master program

Apart from the discipline: "Technology of production and processing of livestock products" the applicants holding a bachelor of arts' degree with major in "Technology of production and processing of livestock products" can continue their studies specialties in the **branch of knowledge 1801 "Specific categories"**:

- - 8.18010010 – "Quality, standardization and certification" under the Master's degree program "Product quality, standardization and certification at poultry enterprises" (see p. 176)
  - 8.18010018 – "Administrative Management" under the Master programs "Management in pig production and processing industry", "Management in bee production and processing industry", "Management in poultry breeding" (see p. 397)
  - 8.18010021 – "Higher School of Pedagogy" under the Master's degree program "Methodology of teaching disciplines related to animal products' production and processing technologies" (see p. 434)
  - 8.18010020 – "Management of educational institution" (see p. 427).

### Curriculum for specialist training of the educational and qualification level "Master" in specialty "Technology of production and processing of livestock products"

№	Discipline, practice	Semester	Scope		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Macro-and Microeconomics	2	108	2,0	3,0
2	Organization of agribusiness	1	108	2,0	3,0
3	Processing of livestock products	1	198	3,6	5,5
4	Research methods in animal husbandry	1	108	2,0	3,0
5	Biological productivity of farm animals	2	180	3,3	5,0
6	Modeling of technological processes in animal husbandry	2	108	2,0	3,0
7	Management of technological processes in animal husbandry	3	144	2,6	4,0
8	Modern trends of selection in animal husbandry	3	108	2,0	3,0
9	Feed resources in animal husbandry	3	144	2,6	4,0
10	Labor safety in animal husbandry	1	54	1,0	1,5
<i>Total number</i>			1260	23,1	35,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional and practical training*</i>					
1	Animal nutrition	1	216	4,0	6,0
2	Physiology of lactation	1	216	4,0	6,0
3	Pigs biology	1	216	4,0	6,0
4	Poultry biology	1	216	4,0	6,0
5	Honeybee biology	1	216	4,0	6,0
6	Population genetics	1	216	4,0	6,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Scope		
			hours	credits	
				national	ECTS
7	Horse biology	1	216	4,0	6,0
8	Quantitative methods of decision making	1	144	2,6	4,0
9	Information technology in animal husbandry	1	144	2,6	4,0
10	Agricultural policy	1	144	2,6	4,0
11	HR management	1	144	2,6	4,0
<i>Total number</i>			360	6,6	10,0
<i>Total chosen by university</i>			1620	29,7	45,0
2.1. Student elective courses					
2.2.1. Cycle of professional and practical training*					
Production specialization					
Master Degree Program "Animal Genetic Resources"					
1	Special genetics	1	108	2,0	3,0
2	Animal genetic resources	2	216	4,0	6,0
3	Biotechnology of animal reproduction	2	180	3,3	5,0
4	Information systems in animal breeding	2	72	1,3	2,0
5	Special breeding	3	72	1,3	2,0
6	Organization of livestock breeding	3	72	1,3	2,0
<i>Total selected by the students</i>			720	13,2	20,0
Master Degree Program "Animal Feeding"					
1	Experiment planning	1	108	2,0	3,0
2	Feeding of ruminant animals	2	252	4,6	7,0
3	Management of bulky fodder	2	216	4,0	6,0
4	Feeding of monogastric animals	3	144	2,6	4,0
<i>Total selected by the students</i>			720	13,2	20,0
Master Degree Program "Dairy cattle breeding"					
1	Maintenance of dairy cattle stock	1	108	2,0	3,0
2	Feeding of high producing cows	2	216	4,0	6,0
3	Management of milk production	2	180	3,3	5,0
4	Production equipment in dairies	2	72	1,3	2,0
5	Intensive technologies of rearing young cattle stock	3	72	1,3	2,0
6	Management and marketing in dairy farming	3	72	1,3	2,0
<i>Total selected by the students</i>			720	13,2	20,0
Master Degree Program "Production and processing of pig breeding products"					
1	Production equipment in pig breeding enterprises	1	108	2,0	3,0
2	Reproduction and breeding of pigs	2	252	4,6	7,0
3	Slaughtering of pigs and processing of pig products	2	216	4,0	6,0
4	Production of pig products	3	72	1,3	2,0
5	Management and marketing in pig breeding	3	72	1,3	2,0
<i>Total selected by the students</i>			720	13,2	20,0
Master Degree Program "Poultry breeding"					
3	Incubation of eggs and embryology basics	1	108	2,0	3,0
4	Production of food eggs	2	216	4,0	6,0
5	Pure-strain stock-breeding in poultry farming	2	180	3,3	5,0
6	Feeding of agricultural poultry	2	72	1,3	2,0
7	Production of agricultural poultry meat	3	72	1,3	2,0
8	Management and marketing in poultry farming	3	72	1,3	2,0
<i>Total selected by the students</i>			720	13,2	20,0
Master Degree Program "Equine and horse husbandry"					
3	Horse breeds	1	108	2,0	3,0
4	Racetrack and sports training in horse breeding	2	216	4,0	6,0
5	World genetic horse breeding resources	2	180	3,3	5,0
6	Reproduction of horses	2	72	1,3	2,0
7	Pure-strain stock-breeding of horses	3	72	1,3	2,0
8	Stud farming	3	72	1,3	2,0
<i>Total selected by the students</i>			720	13,2	20,0
Master Degree Program "Apiculture"					
3	Technological equipment in apiculture	1	108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Scope		
			hours	credits	
				national	ECTS
4	Breeding and keeping of bees	2	216	4,0	6,0
5	Bees' pathology	2	180	3,3	5,0
6	Honey resources and pollination of plants	2	72	1,3	2,0
7	Production, storage and processing of bee products	3	72	1,3	2,0
8	Management and marketing in apiculture	3	72	1,3	2,0
<i>Total selected by the students</i>			720	13,2	20,0
Master Degree Program "Methods of biochemical research"					
1	Special genetics	1	108	2,0	3,0
2	Current methods and devices of biochemical studies	2	216	4,0	6,0
3	Special biochemistry	2-3	252	4,6	7,0
4	Quality management in laboratories	3	144	2,6	4,0
<i>Total selected by the students</i>			720	13,2	20,0
Total number of elected part			1080	43,0	65,0
Practical training			360	6,6	10,0
Writing and defense of master's thesis			540	54,0	15,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of natural science (fundamental) training\**

**Macro-and microeconomics.** This discipline helps students to develop market-oriented economic perspective of social production participants, make them capable professionals or self-employed businesspersons; assists them in mastering versatile tools to make rational economic decisions. The discipline considers the nature of economic behavior exhibited by livestock consumers and producers, resource owners and the state, as well as the issue of livestock industry functioning through market relations as part of the national economy.

**Organization of agribusiness.** This discipline examines the economic substance, specifics of setting up and developing enterprises and businesses, an enterprise as part of business; type of management, business characteristics and functions; economic and legal foundations of business; legal forms of economic activities in agribusiness; business planning at enterprises; cost-effectiveness of small and medium business and methods of its assessment.

**Processing of livestock products.** This discipline focuses on the study of physicochemical and technological properties of animal products as raw materials used to manufacture a wide range of high-quality commodities and their changes under the influence of some technological factors; regulatory requirements to the quality of raw materials and manufactured products prepared from them by using existing technologies and manuals in conditions of processing plants and assessment of their quality in accordance with the requirements of regulatory documentation.

**Research methods in animal husbandry.** The discipline helps students to grasp modern physical, chemical, biochemical and other research methods used in biology and animal husbandry. It considers general and specific research methods in animal husbandry.

**Biological productivity of farm animals.** This discipline allows students to capture extensive knowledge of the problems related to digestion, physiological and biochemical mechanisms of nutrients' transformation in feed ingredients of milk, meat, eggs, wool; control methods and ways by which biologically active substances affect biosynthetic processes in animal tissues. It examines theoretical aspects of hydrolysis mechanisms

and transport of proteins, fats, carbohydrates, amino acids, macro-and microelements in the gastrointestinal tract, the impact of biologically active substances and growth promoters on those processes, and the ways of nutrients transformation in feed constituents of milk, meat, eggs, wool; control methods and ways of improving animal productivity.

**Modeling of technological processes in animal husbandry.** This discipline studies advanced technologies of livestock production, concepts of model and modeling, types of models and basic modeling stages, theoretical and practical methodological foundations, methods, and objects of modeling production processes; economic-mathematical models and modeling processes in animal husbandry by using a personal computer. The students are taught to master modern theoretical concepts of modeling, get acquainted with typical economic-mathematical models of technological processes and their practical application in a production environment.

**Management of technological processes in animal husbandry.** This discipline highlights the essence of process control as a component of production technology and production management in animal husbandry. It focuses on basic principles of organization behind production processes in space and time dimensions, calculating parameters of line production, organization and planning principles of business processes and system of "standard operating procedures" in various fields of animal husbandry. The students learn basic approaches to the operational process control in animal breeding in the context of "deviation management" and methods to identify critical control points in the process chain; study the structure and main functionalities of automatic process control systems.

**Modern trends of selection in animal husbandry.** The objective of discipline is to help students master the breeding theory to identify promising areas of animal husbandry and skills of applying animal assessment, screening and breeding methods in practice. It examines the methodology of selection process in animal husbandry, methods of measuring or determining the main selection parameters. The students examine the issues of using achievements made by population genetics in animal breeding; theoretical basis of selection; animal evaluation and selection methods; inbreeding and heterosis; selection and breeding. The students also learn the features of breeding milk and meat cattle, pigs, sheep, horses and poultry.

**Feed resources in animal husbandry.** The discipline is aimed at creating a system of knowledge and skills of managing planning, production and use of basic feed varieties used in animal nutrition. The discipline curriculum provides for the study of bulky fodder process and operation control system; cattle, sheep and horse feeding systems; management of animal feed and feed additives production and operation system; pig and poultry farming feed systems; information technology used to optimize calculated consumption of animal nutrition.

**Labor safety in animal husbandry.** The discipline helps the future professionals develop skills and competencies to ensure effective management of labor and working conditions on the basis of scientific and technological progress and international experience; it promotes in them awareness of indissoluble unity between successful professional activities and compliance with all safety requirements in a particular area. The discipline examines international safety standards, basic laws and regulations on health and safety in the industry; safety management system in a separate organization; accidents, traumas and diseases in the industry; investigation of accidents, basic fire prevention measures at the sites of animal and poultry production.

---



## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 21.1..Cycle of professional and practical training \*

**Animal nutrition.** The discipline helps the students develop and extend professional knowledge and practical skills to monitor usefulness of animal nutrition, ensure high performance of animals, preserve their health and obtain high biological value products. The object of the discipline is nutritional properties of food; regulation of feed consumption; usefulness of animals feed, which are achieved through elucidation of feed materials' structure and biological role, feed consumption and its regulation, usefulness and quality of animal products.

**Physiology of lactation.** The discipline studies possible causes of breast cancer in ontogeny; milk components; the influence produced by an organism and external environment on the nature of its functioning and optimization of human impact on its exploitation.

**Pig biology.** In this discipline the students familiarize themselves with the structure and functions of somatic, visceral and integrating systems in pigs, their embryonic and postembryonic development, especially gestation, childbirth and lactation; energy metabolism, thermoregulation, ethology, adaptation and stress.

**Poultry biology.** In this discipline the students familiarize themselves with the structure and role played by individual body organs and all systems of birds as a whole. The students acquire knowledge about blood circulation, respiration, digestion, metabolism, thermoregulation, reproduction, neurohumoral regulation of various processes that allow specialists to maintain performance levels of the poultry.

**Honeybee biology.** The discipline sets out a theoretical basis for apiculture. It helps master's degree candidates study the functions of individual species, morphology, anatomy physiology and ecology of the working bee, queen and drone; patterns of bees' social life, i.e. functions that occur as a result of bees living in colonies, which include heat generation, building nests, growth of body weight, swarming, use of honey flow, wintering etc. The students also acquire knowledge about patterns of bees' social life as the foundation on which they can design efficient techniques and methods of apiculture.

**Population genetics.** The discipline provides students with theoretical and practical knowledge of successful breeding techniques and the ways of achieving desired performance parameters in animals through the use of statistical methods in the study of populations; construction of their plausible models; identification of animals who are carriers of agronomic genes and gene ensembles enabling to have progeny with expected performance parameters or new qualitative characteristics; identification of animals who are carriers of inherited genetic conditions.

**Horse biology.** The discipline helps students familiarize themselves with structural features and functions of horse sight, hearing, breathing, digestion, excretion, metabolism, and basics biomechanics (angles of adhered bones, head position and neck movements during fast gait, center of balance and its displacement).

**Quantitative methods of decision making.** The discipline helps students to master methods of predicting external and internal conditions of the future; to make effective management decisions in order to achieve the planned results of livestock production businesses.

**Information technology in animal husbandry.** The discipline provides students with a system of theoretical knowledge and practical skills in modern software used in agricultural production sector, including livestock breeding industry.

**Agricultural policy.** The discipline helps master's degree candidates master theoretical and methodological basis underpinning elaboration and implementation of agricultural policy, acquire the knowledge of evaluating its effectiveness and justify the choice of various state regulation measures.

**HR management.** The objective of this discipline is to provide students with a system of theoretical knowledge about the role and importance of human resource management as a science; teach them basic notions of HR and human resource management; define objectives pursued by the HR management system; introduce the students to HR management classification and its principles.

*2.2. Cycle of professional and practical training \**

*2.2.1. Disciplines chosen by students*

*Production oriented disciplines*

**Master Degree Program “Animal Genetic Resources”**

**Special genetics.** The discipline studies the genetics of basic farm animals: their chromotype features, hereditary anomalies, interbreed gene polymorphism; quantitative and qualitative features. The students acquire knowledge of modern genetic databases and ways of using them. The discipline also considers methods of bioinformatics and genomics of pets.

**Animal genetic resources.** The objective of this discipline is to provide students with theoretical and practical knowledge of industrial activity associated with management of genetic diversity, development of effective breeding technologies, using agricultural animal species in production of agricultural products. It examines the methods used to select and monitor the genetic gene pool of farm animals; theoretical and methodological basis of preserving the genetic pool of animals, animal breeding stock, classification and characterization of animal husbandry genetic resources as well as genetic resources of pigs, cattle, poultry, sheep and horse breeding.

**Biotechnology of animal reproduction.** The discipline allows students to master the latest knowledge and achievement in reproductive biotechnology for intensification of breeding genetically valuable animals to promote selection and enhance livestock productivity and improve its reproductive functions. It examines theoretical and practical bases of embriobiotechnology in farm animals breeding industry, oogenesis, fertilization, embryogenesis, chimerism, transgenosis, cloning, sex determination and their importance for animal breeding; the use of DNA technology in farm animals breeding; identification of animals who are carriers of lethal mutant genes.

**Information systems in animal breeding.** The discipline promotes in students better theoretical and practical knowledge of methods that are currently applied to improve existing and create new herds and breeds of farm animals possessing high performance and better adapted to modern technologies of livestock production. The discipline examines theoretical and practical basis of genetic and mathematical analysis in animal breeding, method of calculating breeding value in breeding animals; considers the software “Baza”, the automated data processing systems in pig breeding, animal selection program “Orsek”, its capabilities and areas of applications; genetic and economic optimization of long-term animal selection programs.

**Special breeding.** The discipline considers the features of selection (evaluation, breeding) of milk and meat cattle, pigs, sheep, horses and poultry; rules of maintaining breeding records; controlling parameters, especially accounting, storage, processing and analyzing primary selection data when working with animals of various species; methods used to control the rate of breeding progress; specifics of using information systems.

**Organization of livestock breeding.** The discipline examines the legislative and regulatory framework of animal breeding in the country (Laws of Ukraine “On the livestock breeding”, “On the National Program in livestock breeding for the period till 2010”, etc.), as well as regulations setting out the general legal, economic and organizational basis for breeding livestock; state tribal registry; state livestock breeding certification; testing newly

---

bred varieties; organization of breeding trials and tests; publishing books and catalogues, organization of exhibitions, auctions, contests.

### **Master Degree Program “Animal Feeding”**

**Experiment planning.** The purpose of this discipline is to help students acquire knowledge and skills in planning animal nutrition experiments as required by description of major discipline: “Technology of production and processing of animal products.” The subject of the study is focused on theoretical foundations of planning animal nutrition experiments, their methods and techniques, breaking down the experiments in stages and implementing research results into production or using them for design research.

**Feeding of ruminant animals.** The purpose of discipline is to help students develop a system of knowledge and skills in feeding ruminants as required by description of major discipline: “Technology of production and processing of animal products.” The subject of study is to know techniques of feeding cattle, sheep and goats; use feed products, diets, ensure nutrition adequacy, quality and safety; prevent animal diseases.

**Management of bulky fodder.** The discipline provides for the study of theoretical and practical issues associated with preparation, evaluation and use of bulky fodder to increase fodder production, improve its quality and enhance the efficiency of livestock breeding industries. Subject of the discipline includes system of rational bulky fodder production, its evaluation and use, development of green fodder conveyor production and pasture management arrangements.

**Feeding of monogastric animals.** The objective of the discipline is to introduce the students to specifics of feeding monogastric animals; modern approaches to regulation and organization of animal feeding. The object of study is nutrition of hogs, horses, poultry, fur animals; feeding of monogastric animals; quality of products depending on nutrition by highlighting theoretical and practical aspects of monogastric animal feeding scientific basis; feeding of pigs and horses; feeding of poultry, rabbits, nutria (European beaver) and fur animals.

### **Master Degree Program “Dairy cattle breeding”**

**Maintenance of dairy cattle stock.** The discipline examines biological characteristics of animals, requirements to parameters of farmyard buildings and equipment, characteristics of materials that are used for manufacturing and constructing animal barns and sheds. During laboratory classes the students conduct analysis of living conditions provided to cows, calves and young cattle at operating enterprises and develop preliminary designs of new and renovated facilities for cattle.

**Feeding of high producing cows.** The discipline allows the students to master modern theoretical concepts of feed nutrition evaluation, rationing and feeding techniques by applying typical economic and mathematical models of optimized diets in a production environment.

**Management of milk production.** The discipline helps the students master the knowledge system underpinning science-based management of milk production through genetic factors and organization of modern milk production operations, based on which the future specialists can implement effective measures to obtain it in market conditions.

**Production equipment in dairies.** The discipline includes analysis of existing domestic and foreign production lines; new dairy processing technologies. It introduces students to the equipment and processes used to produce whole milk, butter, cheese and other products, adopt advanced milk and milk products preprocessing and processing technologies and their practical application in a production environment.

**Intensive technologies of rearing young cattle stock.** The discipline allows students to study the intensification level of animal body growth, development and

---

formation at the early stages of ontogenesis and the influence produced by environmental factors on the process of breeding production animals.

**Management and marketing in dairy farming.** The discipline generates the system of knowledge about the nature and content of management and marketing as a business philosophy under conditions of market economy and competition. It examines the nature and concept of management, marketing and market research of dairy products market, system of marketing (mix-marketing) measures and international marketing.

#### **Master Degree Program “Production and processing of pig breeding products”**

**Production equipment in pig breeding enterprises.** The discipline allows students to master the latest knowledge on European Union and Ukrainian process design standards related to modern pig breeding equipment, machines used to maintain and keep reproductive animals, idle, gestation and lactation sows, weaned piglets, fattening and replacement youngsters, equipment for feeding and watering pigs; for ensuring optimal microclimate conditions; removal and disposal of manure; for active exercise; disinfection, disinfestation and disinsectization.

**Reproduction and breeding of pigs.** The discipline provides the students with knowledge they can use to master modern problems of pigs reproduction and breeding depending on ontogenetic, paratypic and genotypic factors. It examines the structure of animal reproductive system, ovogenesis, spermatogenesis; breeding of replacement young pigs; collecting and storage of boar semen; artificial insemination of sows; specifics of breed formation and trends in pig selection.

**Slaughtering of pigs and processing of pig products.** The discipline allows the students to master methods of slaughter products' rational management; methods of slaughtering pigs and processing pig products. It also examines preparation, pre-processing and storage of raw pig products, pig transport, morphological and chemical composition and factors affecting the quality of meat.

**Production of pig products.** The discipline is designed to teach students make rational choices when using various modern pork production technologies on industrial basis. It examines characteristics of one-, two- and three-phase technology of pork production, and system bioengineering in pig breeding.

**Management and marketing in pig breeding.** The discipline generates in students a system of knowledge about the nature and content of management and marketing as a business philosophy under conditions of market economy and competition. It examines the nature and concept of management, marketing and market research of pig products market, system of marketing measures and international marketing.

#### **Master Degree Program “Poultry breeding”**

**Incubation of eggs and embryology basics.** The discipline allows students to gain knowledge about rules behind production, storage and transportation of standard hatching eggs, techniques of egg processing, treatment and biological control. Students acquire the organization and planning skills in incubation technology, and are introduced to the causes of possible disturbances in the development of embryos and methods of their prevention.

**Production of food eggs.** The discipline introduces students to modern food eggs production and primary processing based on the use of specialized layer chicken breeding crosses and breeds when using all-in-one feeds; full mechanization and automation of production processes subject to the system of veterinary and sanitary measures and quality control.

**Pure-strain stock-breeding in poultry farming.** The discipline introduces students to poultry breeds and breeding crosses; selection and cultivation techniques; types of

---

poultry breeding farms as well as specifics of breeding egg and meat chickens, turkeys, ducks, geese, quails, guinea fowl and ostriches.

**Feeding of agricultural poultry.** The discipline studies the need in different poultry species, productivity and sex-age group trends in energy exchange, nutrients and bioactive substances. The obtained knowledge enables professionals to make recipes of all-in-one feeds, which allow achieving maximum productivity of poultry at lowest poultry feed cost.

**Production of agricultural poultry meat.** The discipline examines modern technologies applied to produce and process broiler chickens, turkeys, ducks, geese, guinea fowl, quail and ostrich meat and techniques to achieve optimal body weight in replacement chicks and poultry parent stock, as well as main factors affecting the growth rate in breeding poultry for meat and fattening for fatty liver.

**Management and marketing in poultry farming.** The discipline examines the system, concept, process, functions, key management factors and conditions of efficient administration in poultry farms; role played by quotes in enterprise marketing and possibility of applying price methods of competition on the market; interrelations between economic, business and trade opportunities and poultry market conditions.

### **Master Degree Program “Equine and horse husbandry”**

**Horse breeds.** The discipline describes evolution of horse breeds in ancient times; introduces students to a world breeding center and its impact on Asian and European breeding; principles of breed classification; unpromising breeds and ways of their preservation for future breeding purposes; main horse breeds in Ukraine.

**Racetrack and sports training in horse breeding.** The purpose of this discipline is to help students study physiological bases of training fast and athletic horse breeds; indoors and racetrack training; rules of testing horses on racetrack; using the results of racetrack testing in breeding work. The discipline highlights the experience of Great Britain and the United States in improving technologies of training thoroughbred and standardbred horses.

**World genetic horse breeding resources.** The discipline introduces students to horse genetic resources as a factor fostering development of small and medium businesses. It examines characteristics, preservation and improvement methods of genetic resources in horse breeding.

**Reproduction of horses.** The discipline examines biological characteristics of horses associated with reproduction, preparation of stallions and mares to coupling; coupling of horses; control and progress of kidling; colting of mares; infertility of stallions and mares and its prevention; rearing the youngsters before weaning; adaptation to existence and operation conditions.

**Pure-strain stock-breeding of horses.** Key issues covered by this discipline are: the structure of horse breeding and brief description of its components, breeding process as a social demand; government measures to promote breeding.

**Stud farming.** The discipline introduces students to heredity and variations of basic selection traits in breeding horses of various breeds and species; relationship between major selection parameters; organization of breeding; specifics of matching mares and stallions in horse breeding; ways of evaluating stallions and mares by quality of their progeny and equine breeding base in the country.

### **Master Degree Program “Apiculture”**

**Technological equipment in beekeeping.** The objective of this discipline is to develop new and improve the existing methods of setting up the automated systems of controlling technological and production processes in beekeeping; methods and algorithms for maintenance and repair of complex electromechanical and computer-integrated

---

automation systems. It highlights main provisions underlying manufacture and operation of beekeeping equipment, comb embedding foundation equipment, raw wax processing equipment, honey pumping, processing, and packaging equipment, equipment for preparation of other bee products, breeding of queen bees, bee disease control equipment, bees transport mechanisms, beekeeping structures.

**Breeding and keeping bees.** This discipline helps students to: study systems designed to monitor and sustain bees and their colonies, maintain them during the annual cycle; variability and heredity characteristics of individual bees and their colonies; organization and performance of breeding work in the industry; study theoretical foundations underlying natural reproduction of bee colonies and stasis bees, development and implementation on the basis of modern technologies and methods of breeding and bee breeding material output.

**Bees' pathology.** This discipline allows students to obtain necessary knowledge about importance of maintaining the bees' feeding, housing and breeding conditions; preventing diseases in bee colonies, know biology of infectious disease pathogens, the ways they spread, losses bees suffer from diseases and pests, especially pathogenesis; symptoms, course of illness and fight against them, as well as to acquire skills of detecting signs of changes in bee colonies' behavior under various diseases at apiary sites; select material for laboratory studies and introduce recreational measures.

**Honey resources and pollination of plants.** This discipline helps students to get better knowledge about food plants that bees use for their nutrition and provide a marketable products; characteristics of nectareous plants, their classification, using nectareous plants to create honey flow in different season periods; clarify the role of bees as pollinators of plants; machinery and pollination of various crops; effectiveness in increasing fruit and seed harvests.

**Production, storage and processing of bee products.** This discipline introduces students to technologies of producing honey, wax, pollen (bee pollen), propolis (bee-glue), royal jelly and bee venom; biology and chemistry of honey, wax and other biologically active products' making process. The discipline allows students to study properties of biologically active products, their effect on quality of different factors and methods of determining fraud; organization of production at the apiaries of different ownership; definition of quality; measures of enhancing apiculture economic efficiency.

**Management and marketing in apiculture.** The objective of this discipline is to generate knowledge and skills that the apiculture professionals need to be able to perform basic management functions and effective management of agricultural production. It studies management of modern social and economic systems of different organizational forms; comprehensive analysis and forecasting of agrarian market; ways of developing marketing strategies and their implementation: commodity, pricing, communication policy and distribution policy, analysis and control of marketing activities.

### **Master Degree Program "Methods of biochemical research"**

**Special genetics.** This discipline studies genetics of the farm animal breeds: their chromotype features, hereditary anomalies, interbreed gene polymorphism; quantitative and qualitative features. The students acquire knowledge of modern genetic databases and ways of using them. The discipline also considers methods of bioinformatics and genomics of pets.

**Current methods and devices used in biochemical studies.** This discipline examines modern electrochemical, spectrometric and chromatographic techniques and devices used in instrumentation laboratory tests to monitor quality and safety of agricultural, food products and environmental objects. It provides basic knowledge for laboratory professionals.

---

## MASTER DEGREE PROGRAMS

**Special biochemistry.** This is a basic discipline providing students with better knowledge of biochemical processes occurring in living organisms that may undergo pathological changes or be poisoned with chemical substances as well as techniques of manufacturing and maintaining livestock products. The master's degree candidates will acquire in-depth knowledge of special biochemistry that play a special role in professional education of biology researchers and facilitate better understanding of other master's degree program disciplines.

**Quality management in laboratories.** This discipline examines national and international standards applicable to organization of chemical analytical laboratories, focuses on assessment of suitability of current methods, traceability and uncertainty of achieved results. The knowledge gained by students will enable them to sufficiently well understand the laboratory work and safely perform analytical measurement techniques.



**Master Training  
in specialty “WATER BIORESOURCES”  
Branch of knowledge “Fisheries and Aquaculture”**

**Form of training, licensed number of students:**

– full-time **75 persons**

– correspondence **75 persons**

**Term of study** **1,5 years**

**Credits** **90 ECTS**

**Language of teaching** **ukrainian language**

**Qualification of graduates** **Aquaculture researcher**

**The concept of training**

In the process of their studies, the specialists in water bioresources familiarize themselves with biological resources of the hydrosphere: production of aquatic resources, productivity, raw water resources. They also study dynamics, abundance and biomass of aquatic organisms, fish productivity of water bodies, dynamics of fishing hydrocole (fish), predicting abundance and biomass of aquatic resources and levels of allowable catch. As a result, the students acquire technology of rational (sustainable) management of aquatic resources in fishery ponds.

Over the course of their training, the specialists in aquaculture study and master the techniques of artificial breeding and reproduction of aquaculture industrial facilities and production as well as technologies of restoring native, rare and endangered hydrocole (fish) species. By the end of the course, the students acquire the techniques of artificial and natural reproduction and production of aquatic resources in fishery ponds.

Finally, the future experts on protection, reproduction and rational use of hydro-bioresources acquire knowledge of hydrocole (fish) selection methods applied for their protection. They also study technologies used to protect and restore native, rare and endangered hydrocole (fish), as well as rational (sustainable) use of aquatic resources, predicting their abundance, biomass and levels of allowable catch. As a result, the master gree candidates acquire the techniques of artificial and natural restoration and protection of native, rare and endangered aquatic resources (AR) in fishery ponds.

**Production oriented master program**

***Master Degree Program “Sturgeon Breeding”***

The objective of the Master’s degree program is to train sturgeon breeding specialists who will work at sturgeon fisheries, in specialized sturgeon fish farms of different types, and in research institutions focusing on preservation of sturgeon populations and breeding of its industrial stocks in natural waters and promote development of commercial sturgeon breeding; the graduatre students will also be employed in agencies of the State Department of Fisheries of Ukraine and address issues related to restoration and monitoring the use of natural resources and ensuring further development of sturgeon commercial aquaculture.

**Sphere of graduates employment**

After having successfully completed the master's degree program, the specialists can apply for employment with the State Department of Fisheries of Ukraine, Ukrainian sturgeon factories and private farms, Department of Aquatic Biological Resources Protection, Reproduction and Regulation of Fisheries in Kyiv Oblast, and the Research Institute of Fisheries, NAAS of Ukraine.



***Master Degree Program “Protection of Hydro-bioresources”***

The main objective of the master's degree program is to prepare specialists of environmental protection who are able to work in the agencies under jurisdiction of the Ministry of Environment or the State Department of Fisheries of Ukraine, oblast or regional fisheries departments, in research institutions, public or private enterprises, whose business relates to protection and reproduction of rare and endangered fish species, moving them into the water in order to restore biodiversity, increasing biological and fish productivity of aquatic ecosystems. Implementation of these measures is based on the scientific substantiation of the main approaches used to optimize efficiency of water use and commercial utilization of water resources and on development of specific measures for protection of aquatic biodiversity, increasing its abundance and sustainable use.

**Sphere of graduates employment**

After having successfully completed the master's degree program, the specialists can apply for employment with the State Department of Fisheries of Ukraine, Department of Aquatic Biological Resources Protection, Reproduction and Regulation of Fisheries in Kyiv Oblast, territorial (oblast and raion) fishery protection bodies, the territorial agencies of the Ministry of Environmental Protection of Ukraine, Research Institute of Fisheries, NAAS of Ukraine, the Institute of Hydrobiology, NAS of Ukraine, public and private fishery farms; the State Fishery Inspection in Kyiv and other Ukrainian Oblasts.

**Research oriented master program**

***Master degree program “Ichthyofauna of Mixed-Use Ponds”***

The main objective of the master's degree program is to train ichthyology professionals who can work in the State Department of Fisheries of Ukraine, State Fishery Inspection, its oblast and raion structures, research institutions and other public and private enterprises dealing with cultivation and fishing in the fish farms, particularly in mixed-use ponds.

**Sphere of graduates employment**

After having successfully completed the master's degree program the specialists can apply for employment in Ichthyological Service of the State Department of Fisheries of Ukraine, Water Bioresources Unit of the State Department of Fisheries of Ukraine, State Institution "Ukrryba"; ichthyological services of Aquatic Biological Resources Protection, Reproduction and Regulation of Fisheries oblast offices and as private entrepreneurs in specialized fish farms at mixed-use ponds.

**Master program of applied biology  
specialization “Laboratory work” for expert control sphere of employment**

***Master degree program “Methods of biochemical research”***

The main objective of the Master's degree program is to teach master degree students perform advanced biochemical, physico-chemical and molecular biological research and use it at work. Preparation of such master degree students will allow staffing specialized laboratories with qualified experts in the field of quality control and safety of agricultural products, food and environment.

**Sphere of graduates employment**

After having successfully completed the master's degree program, the specialists will be able to get employed in specialized veterinary laboratories, diagnostic centers,

---

laboratories, environmental monitoring laboratories, analytical laboratories of companies dealing in production, processing, storage and marketing of agricultural and food products.

### Practical training

Practical training of Fisheries Department students is a component of the curriculum the students require to obtain necessary qualification, professional skills and abilities. This training is performed at the forefront of modern fishery enterprises under organizational and methodological guidance of Department of Aquaculture's faculty and specialists of the enterprises.

While studying at the University, the students receive a thorough theoretical and practical training in modern laboratories equipped with new equipment, in computer classes as well as at leading fishery enterprises such as PJSC "Kyyivrybhosp", SE "Irkliiv Fishpond", SE "Ukrryba", DG "Great Lubin", PJSC "Hmelnytskrybhosp", PE "Aquarium Technologies", PJSC "Sumyrybhosp", PJSC "Hersonrybhosp", JSC "Vilshanka", ARC "Kherson Fishermen", PJSC "Poltavarybhosp", Fishing Farm "Nyvka", IRG NAAS of Ukraine, JSC "Chernihivrybhosp", Astrakhan State Technical University (Astrakhan, Russia) and the Louis Pasteur National Lyceum (France) and others.

### Proposed Topics for Master Theses

1. Fish-breeding and biological rationale for the project of full-scale Lena Sturgeon (*Acipenser baery* Brandt) pond fishery.
2. Features and methodological approaches to breeding domesticated stock of Russian Sturgeon (*Acipenser guldenstadty* Brandt) in sturgeon fisheries.
3. Aqua-design of South America aquasystem decorative freshwater habitat.
4. Innovations in Cichlid fish (*Cichlidae*) keeping and breeding technologies.
5. Methods to improve bioproductivity potential of industrial fishing farms.
6. Forecasting biological productivity of fishery ponds based on the aquatic environment's abiotic factors.
7. Methodological approaches applied to selection and breeding of rainbow trout (*Oncorhynchus mykiss*) in breeding farms.
8. Effective use of synthetic germ cell ovulation stimulants in artificial reproduction of the white carps (*Hypophthalmichthys molitrix*).
9. Current status of fish fauna in mixed-use fishery ponds and ways to improve their fish productivity.
10. Structural and functional characterization of plankton, benthic organisms, and macrophytes in changing aquatic environment conditions.

### Academic rights of applicants for a master program

Apart from the major discipline: "Water Bioresources" the applicants with a bachelor's degree and major in: "Water Bioresources and Aquaculture" can continue their specialties in the **branch of knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification" under the Master's degree program "Management of food safety and quality" (see p.176)
- 8.18010021 – "Pedagogy of Higher School" under the Master program "Methodology of teaching fisheries and aquaculture" (see p. 434)
- 8.18010018 – "Administrative Management" under the Master's degree program "Administrative Management and Agribusiness Marketing System" (see p. 397)
- 8.18010020 – "Management of educational institution" (see p. 427)

MASTER DEGREE PROGRAMS

**Curriculum for specialist training of the educational and qualification level  
“Master” in specialty “Water Bioresources”**

№	Discipline, practice	Semester	Scope		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of professional and practical training *</i>					
1	Psychology of labour relations in fishery enterprises	1	72	1,3	2,0
2	Civil Defence in fishing industry	2	72	1,3	2,0
3	Acclimatization of hydrocole	2	108	2,0	3,0
4	Theoretical foundations of fish farming	1	144	2,7	4,0
5	Fisheries research methods	2	144	2,7	4,0
6	Theory of fish population dynamics	2	108	2,0	3,0
7	Basics of aquatic organisms evolution theory	2	108	2,0	3,0
8	Intensive aquaculture technologies	2	180	3,3	5,0
9	Environmental physiology and biochemistry of aquatic organisms	2	144	2,7	4,0
10	Financial aspects of fishery business	2	108	2,0	3,0
11	Modelling technological processes in fish farming	1	144	2,7	4,0
12	Occupational Health in fish farming	1	108	2,0	3,0
13	Doing business in fish farming	2	72	1,3	2,0
14	World fisheries	2	72	1,3	2,0
<i>Total number</i>			1584	29,3	44,0
Total according to regulatory part			1584	29,3	44,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional and practical training*</i>					
1	Business foreign language	1	54	1,0	1,5
2	Philosophy of science and innovation development	1	54	1,0	1,5
3	Sustainable development of nature and society	1	36	0,7	1,0
4	Agricultural, land and environmental law	1	36	0,7	1,0
5	International standardization and certification of technologies, raw materials and finished goods	1	36	0,7	1,0
Total according to regulatory part			216	4,0	6,0
Production oriented disciplines					
Master degree program “Protection of hydrobioresources”					
<i>2.2. Disciplines chosen by University</i>					
<i>2.2.1. Cycle of professional and practical training *</i>					
1	Protection of aquatic organisms	3	180	3,3	5,0
2	Management of aquatic organisms	3	180	3,3	5,0
3	International fisheries regulation	3	144	2,7	4,0
<i>Total chosen by university</i>			504	9,3	14,0
<i>2.3. Disciplines chosen by students</i>					
<i>2.3.1. Cycle of professional and practical training *</i>					
1	Native ichthyofauna	3	216	4,0	6,0
<i>Total selected by the students</i>			216	4,0	6,0
Master degree program “Sturgeon breeding”					
<i>2.4. Disciplines chosen by University</i>					
<i>2.4.1. Cycle of professional and practical training</i>					
1	Biotechnology of sturgeon breeding	3	180	3,3	5,0
2	Selection of sturgeon breeding objects	3	180	3,3	5,0
3	Biological productivity of sturgeon species	3	144	2,7	4,0
<i>Total chosen by university</i>			504	9,3	14,0
<i>2.5. Disciplines chosen by students</i>					
<i>2.5.1. Cycle of professional and practical training *</i>					
1	Sturgeon husbandry in ponds	3	216	4,0	6,0
<i>Total selected by the students</i>			216	4,0	6,0
Master degree program "Methods of biochemical research"					
<i>2.6. Cycle of professional and practical training *</i>					
<i>2.6.1. Disciplines chosen by University</i>					

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Scope		
			hours	credits	
				national	ECTS
1	Current methods and devices used in biochemical studies	3	288	5,3	8,0
2	Special biochemistry	3	288	5,3	8,0
3	Quality management in laboratories	3	144	2,7	4,0
<i>Total University elective courses</i>			720	13,3	20,0
<i>Research oriented disciplines</i>					
Master degree program "Ichthyofauna of mixed-use ponds"					
2.7. Disciplines chosen by University					
2.7.1. Cycle of professional and practical training*					
1	Ichthyofauna of Ukrainian ponds	3	180	3,3	5,0
2	Ichthyocenology	3	180	3,3	5,0
3	Modern methods of ichthyological research	3	144	2,7	4,0
<i>Total chosen by university</i>			507	9,3	14,0
2.8. Disciplines chosen by students					
2.8.1. Cycle of professional and practical training*					
1	Prediction of fish harvest	3	216	4,0	6,0
<i>Total selected by the students</i>			216	4,0	6,0
Total number of elected part			936	17,3	26,0
Practical training			360	6,7	10,0
Writing and defense of master's thesis			360	6,7	10,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

*1.1. Cycle of professional and practical training \**

**Psychology Labour Relations in fishery enterprises.** The discipline focuses on the facts, and psyche consistent patterns and mechanisms. The master degree candidates are taught to understand the nature and specifics of mental processes, states, personality traits of managers as the basis of their development in the process of training and education, assimilation of basic terms and concepts pertaining to psychology of management.

**Civil Defence in fishing industry.** The discipline examines the ways of setting up protection measures and protecting the public against the effects of economic, natural and environmental emergencies; prevent emergencies; reduce losses; disseminate threat alerts; provide life support during accidents, major fires, natural calamities and disasters, military conflicts; conduct rescue operations; forecast, monitor and control radioactive and chemical contamination; ensure sustainability of agricultural facilities in emergency situations.

**Acclimatization of hydrocole.** This is an important discipline for professional training of ichthyologists/ fish breeders and research personnel targeting such subjects as protection and reproduction of hydrobio-resources and increasing biological productivity and fish productivity of reservoirs. The objective of this discipline is to teach future professionals clearly identify the need for acclimatization works with certain types of aquatic organisms, consider all the risks associated with migration of species into new reservoirs, correctly choose acclimatization objects given their economic value and environmental safety, avoid concomitant pollution with biological material that is dangerous for native fauna, evaluate the effectiveness and profitability of operations.

**Theoretical foundations of fish farming.** This discipline focuses on basics of breeding theory, evidence-based methods and techniques underpinning the modern farming and reproduction of fish stocks under specific environmental conditions in order to

improve existing technologies applied in artificial reproduction of rare and endangered species; develop science-based methods enhancing vitality of fish stocking material at different stages of ontogenesis; grow high-quality commercial fish farming products; create optimal conditions for breeders in factory conditions; develop new sustainable resource-breeding technologies.

**Fisheries research methods.** The discipline combines general methods and techniques of hydrological, hydrochemical, hydrobiological, ichthyological and fisheries research aimed at enhancing sustainable use of natural and artificial hydrobiocenoses.

**Theory of fish population dynamics.** The discipline offers an introduction into the science of sustainable fisheries management and quasi-natural reservoirs relying on the consistent patterns of dynamics in fish populations, estimation of the extent of their stocks and correlation between changes of this value and fishing intensity. The value of fish stocks and their composition undergo annual and long-period fluctuations that can be forecasted and planned by combination of such processes as replenishing industrial fish herds, nutrition, fertility, growth and maturation, mortality from fishing and natural reasons.

**Basics of aquatic organisms evolution theory.** This discipline represents a combination of theoretical and practical knowledge base about evolution based on knowledge of the main evolutionary theory provisions, driving forces behind evolution, study of contemporary perspective on development of wildlife especially the evolution of fishes. It summarizes and organizes knowledge from the standpoint of evolutionary views, introduces students to the history of the different views on nascence and development of wildlife and synthetic theory of evolution, mechanisms of microevolutionary processes, speciation, concept of macroevolution, characteristics and main evolution paths of fish and other aquatic organisms.

**Intensive aquaculture technologies.** This discipline completes the cycle of special courses and focuses on the most recent world and national achievements and scientific research in the field of freshwater and marine aquaculture. Future professionals studying this discipline must get acquainted with the latest global and domestic research and foster their creativity in future careers.

**Environmental physiology and biochemistry of aquatic organisms.** This discipline studies physiological and biochemical processes occurring in the body of aquatic animals at different stages of embryonic and postembryonic development and during their growth in ontogenesis under normal conditions and under the influence of natural aquatic environment factors (temperature, gas treatment, water salinity, etc.). The curriculum of this discipline provides also for studying age-related characteristics and seasonal peculiarities of metabolism in fish at different periods of their annual cycle, as well as physiological and biochemical mechanisms of fish adaptation to natural factors.

**Financial aspects of fishery business.** This discipline considers the trends and challenges of financing activities in fishery enterprises. Particular attention is paid to methodological aspects of financial support in the fishing industry. By the end of this course the master's degree candidates shall be aware of accounting regulations (standards); loans; source documents required for loans; methods of economic analysis (liquidity, profitability, solvency), basic financial statements (balance sheet, income statement).

**Modelling technological processes in fish farming.** Studying this discipline is aimed at developing science-based solutions of process control in fish production, learning measures to increase efficiency of technological processes, develop production plans and evaluate their effectiveness through modeling techniques. Knowledge of methodological approaches to development of mathematical models improve qualification of fishery engineers, help them develop a scientific understanding of technology and enable with new opportunities of improving it in their future careers.

**Occupational health in fish farming.** This is a regulatory discipline that is taught to develop in the future professionals holding the master's degree the knowledge about current status and issues in the field of labor safety in the fishery sector adjusted to the priorities of their basic training. It summarizes organizational requirements of inter-sectoral and industrial safety regulations (NPAOP – Ukrainian Labor Protection Regulations) to be implemented in fishery enterprises at safety management units; requirements to setting up and operating at businesses and enterprises the labor protection services; ways, methods and means of enforcing environment and labor protection regulations during technological processes in the fishing industry to adopt managerial decisions to prevent accidents, injuries and occupational diseases in the industry.

**Doing business in fish farming.** This discipline is included in the final phase of training the students with major in “Water Bioresources.” Students studying this discipline will acquire qualities required of managers and professionals with a firm grasp of business theory and methodology fundamentals and practical skills of doing business in fishing industry. The task of the course “Doing business in fish farming” is to provide solid theoretical and practical business training for students.

**World fisheries.** This discipline provides for a clear understanding of modern methods used in fisheries management, the current state of fish production in the world and in Ukraine, the ability to assess the prospects of the fishing industry in the current environment with regard to trends in global fish market, available resources, increasing fishery production and aquaculture.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professional and practical training \*

**Business foreign language.** The students learning this discipline will develop practical skills of foreign language in everyday, general and professional areas of communication and have sufficient linguistic communicative competence, which - according to the recommendations issued by the Council of Europe - is composed of linguistic, sociolinguistic and pragmatic competence. The discipline is an integral part of training provided to highly skilled agricultural specialties under conditions of building a market economy in Ukraine, expanding Ukraine's international economic relations, enhancing humane and humanistic features of higher education.

**Philosophy of science and innovation development.** The discipline is an important factor in intellectual and spiritual development of students that is called to build in students the ability of adequately understanding and addressing theoretical, methodological, philosophical problems of modern science. The course covers specifics of the science philosophy and innovation development as a special type of human knowledge and as an academic discipline; the course provides description of historical background of major trends and methodological techniques that are used to solve the main problems faced by philosophy of science; the course considers methodological, structural, ideological and perceptual principles and characteristics of scientific knowledge, philosophical analysis of current world and national science, prospects of their development and interaction with other spheres of society.

**Sustainable development of nature and society.** This discipline belongs to one of most recent training courses and relies on interdisciplinary and systematic approach to studying the issue of interaction between humans and the environment in terms of sustainable development policies and strategies.

**Agricultural, land and environmental law.** The discipline generates a system of knowledge in legal regulations pertaining to agrarian relations, legal support of agricultural businesses and farms, land ownership and land use, environmental protection, natural resource management and environmental security.

**International standardization and certification of technologies, raw materials and finished goods.** The objective of this discipline is to help student acquire knowledge of the basic guidelines of international and regional agricultural products standardization and certification organizations, their structure and services, duties and rights; fundamental provisions of international and European legislation in the field of standardization and certification. Since standardization is the area closely associated with all national economy sectors, acquiring appropriate knowledge and skills is a prerequisite for education of true professionals. Considering Ukraine's integration efforts toward the world community the discipline "International standardization and certification of technologies, raw materials and finished goods" is apt to become an important element in the training of professionals seeking to be competitive and possessing current knowledge and experience.

*2.2. Disciplines chosen by University*

*2.2.1. Cycle of professional and practical training \**

*Production oriented disciplines*

**Master degree program "Protection of hydrobioresources"**

**Protection of aquatic organisms.** This discipline examines the scientific basis underlying development and implementation of substantiated hydrosphere protection measures where hydrosphere is regarded as an environment inhabited by aquatic organisms, biological balance of aquatic ecosystems is restored, aquatic biodiversity is maintained, sustainable use of water resources is provided and human impact on water bodies of different types is reduced.

**Management of aquatic organisms.** This discipline studies basic fisheries management principles and structure of fish farming legislation, a specific activity of the state agencies that can be of executive and prescriptive nature and produces an organizing effect on social relationship through public authorities. The students will learn regulations concerning fishery and other aquatic resources and acquire skills of creatively using in each new transaction the corresponding updated regulatory and technological documentation in order to apply this knowledge in their professional activity.

**International fisheries regulations.** This discipline examines the issue of jointly using bioresources in the international water bodies, and the role that Ukraine plays as a sovereign state in regulation of these processes based on Ukraine's foreign and domestic policy priorities in the field of aquatic resources protection, use and reproduction taking into account the country's course towards integration into the European Union and, in particular, harmonization of its national legislation with the EU directives and international environmental regulations.

*2.3. Disciplines chosen by students*

*2.3.1. Cycle of professional and practical training \**

**Native ichthyofauna.** The goal of this discipline is to introduce students to a variety of fish species in ponds and reservoirs that have appeared and evolved in certain areas, and to its indigenous inhabitants. The study of this discipline is needed to prevent mass loss of fish, improve technologies of artificially reproducing industrial, rare and endangered species, creating optimal conditions for natural and artificial reproduction of fish in order to restore, preserve and protect industrial shoals of native fish species.

*2.4. Disciplines chosen by University*

*2.4.1. Cycle of professional and practical training \**

**Master degree program "Sturgeon Breeding"**

---

**Biotechnology of sturgeon breeding.** This discipline examines the organizational structure of sturgeon fish farms, their arrangement, biological basis of comprehensive measures applied to intensify pond sturgeon aquaculture, enhance the biological productivity of water bodies and fish productivity, foster spawn in sturgeon breeding farms, and breed fish stocking material and commodity sturgeon species in the warm pond aquaculture, taking into account systems, forms and cycles of fisheries management.

**Selection of sturgeon breeding objects.** This is the discipline that studies theory and practice of selection and breeding in sturgeon farming. The students will obtain knowledge about sturgeon's biological characteristics and commercial traits in order to develop theoretical and practical foundations for development and operation of domesticated reproduction sturgeon stock, identifying areas of sturgeon selection and breeding work.

**Biological productivity of sturgeon species.** This discipline studies biological and economic features of sturgeon, the current state of sturgeon stocks in the world, population structure and life cycle of most valuable species, the impact produced by natural and anthropogenic factors on performance and techniques of sturgeon artificial reproduction in order to increase the abundance of this species.

## *2.5. Disciplines chosen by students*

### *2.5.1. Cycle of professional and practical training \**

**Sturgeon husbandry in ponds.** This is the discipline that completes the cycle of special courses and provides students with knowledge about the most recent world and national research in the field of sturgeon husbandry in ponds, examines organizational structure of sturgeon fish farms, their arrangement, biological basis of comprehensive measures to intensify pond sturgeon aquaculture, enhance biological and fish productivity of ponds, technologies for fostering spawn in sturgeon breeding farms, technologies of building the reproduction sturgeon stock and stock of commodity pond sturgeon in warm-water aquaculture, taking into account systems, forms and cycles of fisheries management.

## *2.6. Disciplines chosen by University*

### *2.6.1. Cycle of professional and practical training \**

#### **Master degree program "Methods of biochemical research"**

**Current methods and devices used in biochemical studies.** This discipline examines modern electrochemical, spectrometric and chromatographic techniques and devices used in instrumentation laboratory tests to monitor quality and safety of agricultural, food products and environmental objects. It provides basic knowledge for laboratory professionals.

**Special biochemistry.** This is a basic discipline providing students with better knowledge of biochemical processes occurring in living organisms that may undergo pathological changes or be poisoned with chemical substances as well as techniques of manufacturing and maintaining livestock products. The master degree candidates will acquire in-depth knowledge of special biochemistry that play a special role in professional education of biology researchers and facilitate better understanding of other master's degree program disciplines.

**Quality management in laboratories.** This discipline examines national and international standards applicable to organization of chemical analytical laboratories, focuses on assessment of suitability of current methods, traceability and uncertainty of achieved results. The knowledge gained by students will enable them to sufficiently well understand the laboratory work and safely perform analytical measurement techniques.

---



*2.7. Disciplines chosen by University*

*2.7.1. Cycle of professional and practical training \**

*Research oriented disciplines*

**Master degree program “Ichthyofauna of mixed-use ponds”**

**Ichthyofauna of Ukrainian ponds.** This discipline is part of professional and practical training of master’s degree students with major in “Water Bioresources”; upon completion of this course, the students will master modern data on fish biodiversity of Ukraine’s inland waters, Azov and Black Seas, and the current classification system for ichthyoid and fish, their biological characteristics; fundamentals and principles of Ukrainian ichthyofauna’s systematics.

**Ichthyocenology.** This discipline provides knowledge about fish grouping habits and patterns of such grouping in water reservoirs of different types, dependence of fish communities (ichthyocenosis) on environmental factors. Particular attention is given to groups dominated by commercial fish species and some rare and endangered species of Ukrainian fauna.

**Modern methods of ichthyological research.** This is a comprehensive professional applied discipline for ichthyologists and fish breeders. It generalizes and extends the hydrological, hydrochemical, ichthyological research methods in fish husbandry.

*2.8. Disciplines chosen by students*

*2.8.1..Cycle of professional and practical training\**

**Prediction of fish harvest.** This is the professional applied discipline targeting the audience of ichthyologists and fish breeders. Its main task is to teach students make industry forecasts that are necessary to achieve rational planning of fishing industry and ensure its sufficiency of raw materials. The discipline generalizes and extends the knowledge of laws applicable to fish population dynamics, as well as ichthyological and commercial fishery research methods in fish husbandry.

---

**EDUCATION AND RESEARCH INSTITUTE  
OF VETERINARY MEDICINE,  
QUALITY AND SAFETY OF LIVESTOCK PRODUCTS**

**Director** - Doctor in Biology, Professor Mykola Ivanovych Tsvilikhovskiy  
**Tel.:** (044) 527-82-31  
**E-mail:** m\_tsvilikhovsky@nubip.edu.ua  
**Address:** building № 12, room №324

**FACULTY OF VETERINARY MEDICINE**

**Dean** - Doctor of Veterinary Sciences, Professor Prus Mykhaylo Petrovych  
**Tel.:** (044) 527-82-98  
**E-mail:** Prus.dean@i.ua  
**Address:** building № 12, room №303

**Faculty provides organization and coordination of studying process of training masters in direction:**

**8.11010101 “Veterinary medicine (by specialities)”**

**Graduating departments:**

**Obstetrics, Gynecology and Animal Reproduction Biotechnology**

**Tel.:** (044) 527-83-46

**E-mail:** reproduce\_chair@twin.nauu.kiev.ua

**Head of Department** - Doctor of Veterinary Sciences, Professor Lubetskiy Vitaliy Josephovich

**Veterinary-sanitary examination**

**Tel.:** (044) 527-88-41

**E-mail:** vse@nauu.kiev.ua

**Head of Department:** Doctor of Veterinary Sciences, Professor Yakubchak Olga Mykolaivna

**Hygiene of the livestock named after A.K Skorokhodko**

**Tel.:** (044) 527-80-69

**E-mail:** sanitary\_chair@twin.nauu.kiev.ua

**Head of Department** - Doctor of Veterinary Sciences, Professor Mykolay Oleksandrovych Zakharenko

**Epizootiology and organization of veterinary medicine**

**Tel.:** (044) 527-89-22

**E-mail:** infection\_chair@twin.nauu.kiev.ua

**Head of Department:** Doctor of Veterinary Sciences, Professor Nedosekov Vitaliy Volodymyrovych

**Parasitology and Tropical Veterinary Medicine**

**Tel.:** (044) 527-83-65

**E-mail:** kaf\_parasitology@mail.ru

**Head of Department:** Doctor of Veterinary Sciences, Professor Soroka Natalia Mykhaylivna

**Pathological anatomy**

**Tel.:** (044) 527-86-17

**E-mail:** patanat\_chair@twin.nauu.kiev.ua

---

MASTER DEGREE PROGRAMS

**Head of Department** - Doctor of Veterinary Sciences, Professor Borisevich Boris Vladymirovych

**Therapy and clinical diagnosis**

**Tel.:** (044) 527-87-92

**E-mail:** golopura@ukr.net

**Head of Department:** Candidate of Veterinary Sciences, Associate Professor Golopura Sergiy Ivanovych

**Pharmacology and Toxicology**

**Tel.:** (044) 527-80-29

**E-mail:** pharma\_chair@twin.nauu.kiev.ua

**Head of Department:** Doctor of Veterinary Sciences, Professor Volodymyr Bogdanovych Dukhnytsky

**Surgery named after prof. I.O Povazhenko**

**Tel.:** (044) 527-88-68

**E-mail:** surgeryfvm@i.ua

**Head of Department:** Candidate of Veterinary Sciences, Associate Professor Doroschuk Victor Oleksandrovych

---

**Master Training  
in specialty “VETERINARY MEDICINE”  
Branch of knowledge “Veterinary”**

**Form of training, licensed number of students:**

– full-time **250**

– correspondence **25**

**Term of study** **2 years**

**Credits** **120 ECTS**

**Language of teaching** **Ukrainian, English, Deutsch**

**Qualification of graduates** **Doctor of veterinary medicine**

**The concept of training**

Means training of highly qualified specialists in veterinary medicine, quality and safety of animal products in accordance to international standards. Professional herd health management, issues of quality and safety of animal products during its production, transportation, processing, storage and marketing. Elaboration and implementation in practice of innovative methods of prevention, diagnostics and treatment of animal diseases

**Production oriented master program**

***Master Program of Veterinary preventative technologies of animal health support***

The program includes training of professional doctors of veterinary medicine who possess knowledge required for veterinary service of owners of productive animals and poultry, horses, small animals and who is ready to analyze the epizootic situation, carry out preventive measures and diagnostic tests, to ensure the provision of medical care the animals suffering from infectious and non-infectious pathology.

**Sphere of graduates employment**

The field of employment of graduates of the program can be specified professional activities in the state veterinary medicine in rural areas (hospitals veterinary medicine, paragraphs, sections), a private veterinary practice to meet the needs of owners of productive veterinary service and small animals, farms and collective farms.

**Practical training**

It will be carried out during the laboratory sessions, master production practices and implementation of the master's work in the educational and research enterprises NUBiP of Ukraine, government veterinary institutions (regional management of veterinary medicine, veterinary stations), agricultural enterprises of different ownership.

***Master Program of “Veterinary service in livestock, sheep and goats”***

The program provides training of professional masters in cattle, sheep and goat farming and aimed up to the formation of veterinary knowledge and skills to implementation and using of innovative technologies in nutrition, genetics, breeding, biotechnology and ruminant reproduction and ensuring of preventive technologies from noncontagious and contagious diseases of ruminants.

**Sphere of graduates employment**

Professional activity of expert due to master's program means working in manufacturing sector of employment associated with modern highly technological

enterprises and dairy companies, complexes with beef, lamb and sheep, production, farms that specialized on growing of goats and the production goat farming.

### **Practical training**

Practical training will took place during the laboratory sessions, master production practices and implementation of the master's work in the educational and research enterprises NUBiP of Ukraine, livestock enterprises that manufacture products of cattle farming, sheep and goat, dairy companies, public institutions of Veterinary Medicine (Local Management of veterinary medicine, veterinary stations), agricultural enterprises of different ownership.

### ***Master Program “Providing of pig breeding”***

The program includes training of professional doctors of veterinary medicine who have knowledge of modern technologies of production of pig welfare, veterinary ensuring of specialized high-tech pig complexes and became capable to improve processes, veterinary and sanitary, preventive and diagnostic measures aimed the economic indicators of the industry.

### **Sphere of graduates employment**

The field practical activity which is specified in graduate programs are complex and specialized farms producing pork, breeding, reproducers fattening centers and research institutions engaged in scientific accompaniment of the industry, innovational and advisory activities in pig industry.

### **Practical training**

Done during the laboratory sessions, master production practices and implementation of the master's work in the educational and research enterprise NUBiP of Ukraine, pig farms, state veterinary institutions (regional management veterinary medicine, veterinary stations) and agricultural enterprises of different ownership.

### ***Master Program “Providing horse breeding”***

Training of specialists of veterinary medicine involves material development of undergraduates related on biotechnology of horse reproduction and other hoofed animals, modern technologies of breeding, housing, feeding and maintenance. During the training masters acquire the latest methods of diagnosis, treatment and prevention of animal diseases.

### **Sphere of graduates employment**

Professional activity of graduates by certain program will be associated with the veterinary maintenance of industry in large state stud farms, horse farms, equestrian sports schools, racetracks, divisions of Ministry and border guards, maintenance of individual horse owners and collective farms and wild hoofed animals in nature reserves, innovation and advisory activities.

### **Practical training**

Done during the laboratory sessions, master production practices and implementation of the master's work at the stud farm, farms for breeding horses, hippodrome, Kiev Zoo, where reserves are odd-toed animal hospitals for horses, veterinary public institutions (regional management veterinary medicine, veterinary stations), agricultural enterprises of different ownership.

---

***Master Program “Providing poultry farming”***

The program provides training for doctors of veterinary medicine who possess theoretical knowledge and practical skills for work in the field of modern poultry farming (technological processes of production, methods ecological safe methods, poultry waste utilization, health and safety requirements for poultry farms, technological schemes of prevention of contagious and noncontagious diseases of poultry, economy of modern poultry farming).

**Sphere of graduates employment**

Practical activities of graduates encompasses national and regional industrial associations poultry farming, National Centre for specialists of veterinary medicine poultry raising, Regional Departments of Veterinary Medicine, commercial egg and poultry meat plants , Incubator stations poultry processing plant etc.

**Practical training**

Practical training will be provided during the laboratory sessions, master production practices and performance of the master's work in the public enterprise "Teaching and Research Bird Breeding Plant named by Frunze", modern industrial poultry enterprises producing eggs and meat chickens, incubator stations.

***Master Program of “Veterinary care of dogs and cats”***

The aim of program is to train a doctor of veterinary medicine who has knowledge of biology of dogs and cats, their housing, feeding and breeding, also to study the modern methods of diagnosis and prevention of contagious and non-contagious diseases , effective schemes of therapy for small animals.

**Sphere of graduates employment**

Field of graduate`s practice includes official dog breeding by Ministry of Internal Affairs and the State Border Service, kennels for dogs, dog clubs, shelters for small animals, veterinary clinics for small animals, private service for owners of small pets.

**Practical training**

Practical training will be done during the laboratory sessions, master production practices and implementation of the master's works in the field of the clinic researches of small animals, urban clinics for small animals, shelters for small animals, kennels for dogs, dog clubs, during the exhibition of dogs and cats.

***Master Program of “Veterinary care about exotic and wild animals”***

The aim of program is to train a doctor of veterinary medicine who has knowledge of biology of exotic and wild animals, their housing, feeding and breeding, diagnosis and prevention of contagious and non-contagious diseases , treatment of animals in conditions of wild fauna or kept in zoos, apartments owners.

**Sphere of graduates employment**

The field of graduate`s practice may be state-owned enterprises which affiliated to the Ministry of Environment and the State Forestry Committee (national parks, forestry, hunting, nature reserves and wildlife sanctuaries, zoos) research zoological institutions and veterinary clinics for small animals.

**Practical training**

Practical training will be provided during the laboratory at the Department of Parasitology and Tropical Veterinary Medicine, Master of production practices and

---

implementation of master's work in clinics for small animals, educational clinics and research institute of veterinary medicine, quality and safety of animal products, Kiev Zoo, National Circus, private clinics exotic animals in Kyiv.

### ***Master Program of “Veterinary support of pisciculture”***

The master's program provides graduate students to master the knowledge of the fundamentals of development and reproduction, cultivation of fish and other aquaculture objects, quality and safety of fish products, sanitary requirements for water and food for growing fish, diagnosis and prevention of noncontagious diseases and poisonings, infectious and parasitic diseases, carrying out therapeutic measures for diseases of fish and other aquatic organisms, providing hygienic standards and veterinary-sanitary requirements for the technological processes on fish processing plants.

### **Sphere of graduates employment**

Doctor of Veterinary Medicine by the Master's program "Veterinary service of pisciculture" is ready for work on the corresponding positions in the system of the fishing industry of Ukraine, such as fishery, fish processing plant, fishing farm, breeding plants for veterinary welfare of aquaculture of objects.

### **Practical training**

Practical training of undergraduates will be provided during the laboratory sessions, master production practices and implementation of the master's works at the Nemishayevsky training center of fisheries, fishing farm, fishery, breeding and reclamation plants, research institutions sector.

### ***Master Program “Veterinary-sanitary inspection, safety and quality of foodstuffs and fodder”***

Program is aimed to train masters who have theoretical knowledge and practical skills to carry out veterinary-sanitary inspection and control over the quality and safety of food and fodder.

The program studies hygiene requirements for the production of milk and dairy products, meat and meat products, fish and fish products, honey, eggs, vegetables and fodder products on all stages the technological process in order to produce safe and qualitative products.

### **Sphere of graduates employment**

Mastering of program will provide training of veterinary-sanitary expert, the field of which may be the State Veterinary Service, food and fodder industry (official doctors of meat processing and milk processing plants, fishing plants, cold storage facilities, doctors of veterinary-sanitary expertise of state veterinary laboratories, food laboratories and laboratories of mixed fodder factories).

### **Practical training**

Practical training of undergraduates will be provided during the laboratory sessions, master production practices and implementation of master's thesis in the Institute of Veterinary Medicine and Veterinary examination, laboratory processing enterprises animal products, fish, poultry processing plant, laboratories, food and feed industry, laboratories, veterinary and sanitary examination.

### ***Master Program in “Veterinary pharmacy”***

In accordance to their future master's degree in veterinary pharmacy should be ready for creative and professional pharmaceutical activities in the sphere of veterinary

---

medicinal products, providing of their research, development, production, packing, storage, transportation, state registration, certification, standardization and quality control, sale, marketing, use and disposal of medicines which came shelf life.

### **Sphere of graduates employment**

Professional activity of Masters in Veterinary Pharmacy can be productive (pharmacy, pharmaceutical and chemical-pharmaceutical companies, etc.).organizational and managerial, supervisory (licensing, certification, registration), the total pharmaceutical practice (city and district veterinary pharmacy, pharmacy in rural areas, veterinary pharmacies in therapeutic and diagnostic centers and clinics), information and education, research.

### **Practical training**

The practical component of the training of masters in veterinary pharmacy will be provided during the laboratory sessions, master production practices and implementation of master's works in veterinary pharmacies, pharmaceutical compositions, Ukrzoovetprompostach regional associations, enterprises engaged in the production of veterinary medicinal products ("Ukrzoovetprompostach", "Brovafarma", "Basalt"), production units of regional veterinary laboratories, laboratories for drug quality control).

### ***Master Program in "Veterinary Hygiene and Sanitation"***

Training of doctors of veterinary medicine for the Master's program "Veterinary Hygiene and Sanitation" involves the formation in students of theoretical knowledge and skills in veterinary hygiene and sanitation to solve practical problems in production of animal products, milk and meat enterprises on border and transport and other objects of veterinary medicine.

### **Sphere of graduates employment**

Training of Masters in frame of program will provide training of doctor of veterinary hygiene and sanitation for the relevant positions of the State Veterinary and Phytosanitary Service, companies of fodder industry, milk and of meat processing plants, customs and in production and processing of various types of livestock.

### **Practical training**

The practical component in the preparing of the Master of Veterinary Hygiene and sanitation will be provided during the laboratory sessions, master production practices and implementation of the master's work in the SRF NUBiP of Ukraine, modern high-tech enterprises with livestock production, processing plants, veterinary and sanitary items rail transport units of veterinary medicine dealing with disinfection, disinsection and deratisation.

### **Research oriented master program**

#### ***Master Program "Scientific fundamental problems of Veterinary Medicine"***

The program`s aim is training of veterinary-sanitary scientist who has knowledge that is necessary for carrying out researches in modern morphology, cytology and embryology, genetic engineering and biotechnology, DNA technology and biochemical studies on the cellular level, veterinary immunology, biology and ecology of microorganisms and viruses.

---



### **Sphere of graduates employment**

Further study in graduate school for basic specialties of veterinary and biological profiles, professional activities in research institutions of biological, veterinary and medical standpoints, Ukrainian Laboratory of Quality and Safety of Agricultural Products, Institute of Laboratory Diagnostics and veterinary-sanitary examination, regional and district state laboratory of veterinary medicine.

### **Practical training**

Practical training of masters and researchers will be made during the laboratory sessions, master production practices and implementation of the master's work in research laboratories fundamental departments of the Educational and Research Institute of Veterinary Medicine, Quality and Safety of Animal Production and Ukrainian Educational and Research Institute of Quality of Life and Life Safety, Ukrainian Laboratory of Quality and Safety of Agricultural Products, scientific research institutions of the State Veterinary and Phytosanitary service for further study in graduate school.

### ***Master Program "Problems of Veterinary Medicine"***

The program's aim is training doctor of veterinary medicine- scientist who has knowledge that is necessary for support of scientific problem solving of veterinary medicine to ensure preventive measures to prevent contagious and non-contagious diseases etiology and productive animals protection of the territory of Ukraine from entering of dangerous zoonoses , obtaining animal products high quality and safety.

### **Sphere of graduates employment**

Further study in graduate school for applied scientific veterinary specialist, professional activities in research institutions of veterinary guidance, inspection function in the Department of Veterinary Medicine, scientific support during the production of cattle, pigs, poultry in modern high-tech livestock farms consulting and innovation.

### **Practical training**

Practical training of masters and researchers will be provided during the laboratory sessions, master production practices and performance of the master's work in research laboratories clinical departments of the Educational and Research Institute of Veterinary Medicine, Quality and Safety of Animal Production, SRF NUBiP of Ukraine, Ukrainian Laboratory of Quality and Safety of Agricultural Products, scientific research institutions of the State Veterinary and Phytosanitary Service to subsequent studies in graduate school.

### **Master program for training of masters in applied biology Specialization "Laboratory Work" Expert-control field of employment**

### ***Master program "Methods of biochemical research"***

Preparation of masters in applied biology specializing on "laboratory work" in the MA program provides training of specialists capable to perform modern biochemical, physicochemical and molecular biological research methods in order to conduct biochemical analysis of the environment and the macro system, analytical, biochemical, physic-chemical analysis of raw materials, food and forages in production laboratories for various purposes.

### **Sphere of graduates employment**

Ukrainian Laboratory of Quality and Safety of Agricultural Products and its affiliates, state analytical and diagnostic centers for standardization and certification of agricultural products, research institutes and laboratories of veterinary medicine, analytical

---

laboratories of companies engaged in production, processing, storage and marketing of agricultural products.

### **Practical training**

During the laboratory sessions, master production practice and implementation of the master's work in certified modern laboratories that deals with the quality and safety of agricultural products, perform diagnostic tests in veterinary medicine and animal husbandry, deals with veterinary and sanitary examination.

#### ***Master program “Microbiological diagnostic methods in veterinary medicine”***

The aim of the program is to train of highly qualified specialists in laboratory diagnosis of infectious diseases, microbiological (bacteriological, virological) study of materials and foodstuffs, animal feed and environmental objects.

The basic task of the program is to master modern methods of detection of bacteria and viruses, the formation of future professionals in the environmental and of biological thinking, knowledge of their possible essence of phenomena caused by microorganisms (viruses) in animal organisms, raw materials, food and various environmental objects.

### **Sphere of graduates employment**

Microbiological laboratories , providing diagnostic tests in veterinary medicine (state laboratories of veterinary medicine) and general sanitary practice, providing microbiological control of animal products, industry labs (poultry farms, incubator stations, pig farms, companies producing animal feed), laboratories of food industry.

### **Practical training**

Its aim is to master the knowledge of laboratory methods for detection of microorganisms and viruses, their identification, establishing pathogenicity and virulence. The development of methods for microbiological and virological studies in veterinary medicine and animal husbandry in order to establish the diagnosis, level of microbial contamination of livestock facilities, enterprises that deals with animal product processing and determination the effectiveness of disinfection.

#### ***Master Program “Veterinary-sanitary examination of agricultural and food products”***

State veterinary-sanitary inspection of agriculture and food products under the patronage of veterinary control. Control of quality and safety of animal products, methods of their determination in Ukraine and the EU.

Consider the problems of hygienic assessment and food safety, prevention of potential dangers related to food, determine the degree of risk to the consumer, mastery of modern methods of veterinary-sanitary examination of foods.

### **Sphere of graduates employment**

Achievement mastery of program enables graduates to carry out expert-monitoring function in veterinary medicine and food processing industry, at the custom offices ( control of the import /export) Animal raw materials and finished products, trade establishments (supermarkets). The place of employment may be Ukrainian Laboratory of Quality and Safety of Agricultural Products, State Research Institute of Veterinary Medicine and Veterinary expertise, state laboratory of veterinary-sanitary examination of agro-food markets, meat enterprises, processing plants of animal products, veterinary border posts and supermarkets.

---

### **Practical training**

Is performed during laboratory and laboratory-practical classes (directly under industrial conditions), as well as during the production of master practice. Bases of practical training can be Ukrainian Laboratory of Quality and Safety of Agricultural Products NUBiP Ukraine, State Research Institute of Veterinary Medicine and Veterinary examination, laboratory veterinary-sanitary examination of agro-food markets, modern high-tech enterprises of milk production, dairy plants, meat processing plants, poultry processing plant and etc.

#### ***Master Program “Pathomorphological diagnostics of animal diseases”***

The program involves the study of the structure of government veterinary laboratories, the main methods of histological studies, pathomorphological diagnostics of diseases of different etiology (bacterial, viral, parasitic, noncontagious, poisoning) in animals of different species.

We study the methodological and methodical features of pathoanatomical diagnostics and formulating of conclusion about the cause of death of the animal based on done preventive and therapeutic measures. The program includes the following courses: quality management laboratory activities, basis of histological techniques and research methods; pathomorphology of animal diseases of different etiologies.

### **Sphere of graduates employment**

Professional activity of veterinary medicine doctor under this program will be carried out in the field of veterinary medicine in positions veterinary pathologist in the regional offices of Veterinary Medicine, Institute of Laboratory Diagnostics and Veterinary Examination, State Veterinary Laboratory of regional and district levels, pig, poultry other types of industrial enterprises, as well as provide solutions for forensic veterinary medicine.

### **Practical training**

Practical training for undergraduates will take place at laboratory classes in the departments: pathological anatomy, cytology, histology and embryology, biochemistry and during the training and production practice in educational and research farms NUBiP Ukraine, Ukrainian Laboratory of Quality and Safety of Agricultural Products NUBiP Ukraine, State Scientific - Research Institute of Laboratory Diagnostics and veterinary and sanitary examination, veterinary laboratories of regional and district levels.

### **Proposed Topics for Master Theses**

1. Management in dairy farming and monitoring indicators of safety and quality of milk.
  2. The organization of veterinary support in pig farming using Dutch technology.
  3. Development of quality management system in production of veterinary drugs.
  4. Obstetric and gynecological clinical examination of mares at stud-farm.
  5. Monitoring the spread of genetically modified food products in Ukraine.
  6. Veterinary preventive measures in the system of preventing respiratory diseases in calves.
  7. Substantiation treatment methods for pets in case of poisonings by components of health care animal feed.
  8. Anaesthetization in surgery of wild feline.
  9. Forensic veterinary examination the causes of death in poultry farming of industrial type.
  10. Clinical and pharmaceutical approaches to the selection of drugs in pathologies of the cardiovascular system.
-

**Academic rights of applicants for a master program**

In addition to the specialty “Veterinary Medicine (by directions)” entrants with a bachelor's degree in the specialty of “Veterinary Medicine” can continue their studies specialties in the **branch of knowledge 1801 “Specific categories”**:

**8.18010010** – “Quality, standardization and certification” Master`s Program “Management of safety and quality of food” (see p. 176)

**8.18010021** – “Pedagogy of Higher School" Master's Program “Teaching Methods of the cycle of veterinary sciences” (see p. 434)

**8.18010018** – “Administrative Management" Master's Program "Organization management in veterinary medicine" specialty (see p. 397)

**8.18010020** – “Management of Educational Institution,” Master Program “Management activities in higher education institutions of I-II levels of accreditation” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Veterinary Medicine”**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Philosophy of science and innovation development	1	72	1,3	2,0
2	Foreign language in professional activities	1	54	1,0	1,5
3	Information Technology in Veterinary Medicine	1	54	1,0	1,5
<i>Total number</i>			180	3,3	5,0
<i>1.2. Cycle of natural science (fundamental) training *</i>					
1	Comparative morphology, special pathomorphology and forensic veterinary medicine	1	90	1,7	2,5
2	Veterinary legislation of Ukraine and international veterinary law	1	90	1,7	2,5
3	Methodology of scientific research	1	90	1,7	2,5
<i>Total number</i>			270	5,1	7,5
<i>1.3. Cycle of professional and practical training *</i>					
1	Obstetrics, Gynaecology and Animal Reproduction Biotechnology	2	108	2,0	3,0
2	Special propaedeutics, therapy and prevention of internal diseases	2	126	2,3	3,5
3	Surgical diseases of animals with anesthesiology	2	108	2,0	3,0
4	Special epizootiology	2	108	2,0	3,0
5	Global parasitology	2	108	2,0	3,0
<i>Total number</i>			558	10,3	15,5
Total with the statutory part			1080	18,7	28,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of humanitarian, social and economic training**</i>					
1	Philosophy of science and innovation development	1	36	0,67	1,0
2	Foreign language in professional activities	1	36	0,67	1,0
3	Information Technology in Veterinary Medicine	1	36	0,66	1,0
<i>Total number</i>			108	2,0	3,0
<i>2.1.2. Cycle of natural science (fundamental) training *</i>					
1	Comparative morphology, special pathomorphology and forensic veterinary medicine	1	54	1,0	1,5
2	Veterinary legislation of Ukraine and international veterinary law	1	54	1,0	1,5
3	Methodology of scientific research	1	36	0,67	1,0

**MASTER DEGREE PROGRAMS**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<i>Total number</i>			144	2,67	4,0
2.1.3. Cycle of professional and practical training **					
1	Obstetrics, Gynecology and Animal Reproduction Biotechnology	2	72	1,3	2,0
2	Special propaedeutics, therapy and prevention of internal diseases	2	54	1,0	1,5
3	Surgical diseases of animals with anesthesiology	2	54	1,0	1,5
4	Special epizootiology	2	54	1,0	1,5
5	Global parasitology	2	54	1,0	1,5
<i>Total number</i>			288	5,3	8,0
<i>Total chosen by university</i>			540	10,0	15,0
2.2. Disciplines chosen by students					
2.1.1. Cycle of humanitarian, social and economic training*					
1	Foreign language in professional activities	1	54	1,0	1,5
2	Information Technology in Veterinary Medicine	1	54	1,0	1,5
<i>Total number</i>			108	2,0	3,0
2.2.2. Cycle of natural science (fundamental) training*					
1	Comparative morphology, special pathomorphology and forensic veterinary medicin	1	54	1,0	1,5
2	Veterinary legislation of Ukraine and international veterinary law	1	54	1,0	1,5
3	Methodology of scientific research	1	54	1,0	1,5
<i>Total number</i>			162	3,0	4,5
2.2.3. Cycle of professional and practical training *					
1	Obstetrics, Gynecology and Animal Reproduction Biotechnology	2	54	1,0	1,5
2	Special propaedeutics, therapy and prevention of internal diseases	2	54	1,0	1,5
3	Surgical diseases of animals with anesthesiology	2	54	1,0	1,5
4	Special epizootology	2	54	1,0	1,5
5	Global parasitology	2	54	1,0	1,5
<i>Total number</i>			270	5,0	
Production oriented disciplines					
Master program "Preventive veterinary technologies providing animal health"					
1	Preventive technologies to ensure the health of productive animals	3,4	576	10,7	16
2	Preventive technologies to ensure the health of horses	4	576	10,6	16
3	Preventive technologies to ensure the health of small animals	3	576	10,7	16
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
Master program "Veterinary welfare of cattle, sheep and goats"					
1	Innovative technologies nutrition, genetics and breeding of cattle, sheep and goats	3	360	6,7	10,0
2	Preventive veterinary technology non-communicable diseases of ruminants	3,4	684	12,7	19,0
3	Preventive veterinary technology communicable diseases of ruminants	3,4	684	12,6	19,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
Master program "Veterinary welfare swine breeding"					
1	Innovative technologies nutrition, genetics and breeding pig	3	360	6,7	10,0
2	Preventive veterinary technology non-communicable diseases of pigs	3,4	684	12,7	19,0

**MASTER DEGREE PROGRAMS**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
3	Preventive Veterinary Technology contagious disease of pigs	3,4	684	12,6	19,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Veterinary equine welfare"</b>					
1	Innovative technologies nutrition, genetics and horses breeding	3	360	6,7	10,0
2	Preventive veterinary technology non-communicable diseases of horses	3,4	684	12,7	19,0
3	Preventive veterinary technology contagious disease of horses	3,4	684	12,6	19,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Poultry veterinary welfare"</b>					
1	Innovative technologies nutrition, genetics and poultry breeding	3	360	6,7	10,0
2	Preventive veterinary technology non-communicable diseases of poultry	3,4	684	12,7	19,0
3	Preventive veterinary technology contagious disease of poultry	3,4	684	12,6	19,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Dogs and cats veterinary support"</b>					
1	Innovative technologies nutrition, genetics and dogs and cats breeding	3	360	6,7	10,0
2	Preventive veterinary technology non-communicable diseases of dogs and cats	3,4	684	12,7	19,0
3	Preventive veterinary technology contagious disease of dogs and cats	3,4	684	12,6	19,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Exotic and wild animals veterinary support"</b>					
1	Housing, feeding and reproduction of exotic and wild animals	3	360	6,7	10,0
2	Modern diagnosis and treatment of non-communicable diseases exotic and wild animals in the non-contagious diseases	3,4	432	8,0	12,0
3	Infectious diseases of exotic and wild animals	3,4	468	8,7	13,0
4	Parasitic diseases of wild and exotic animals	3	468	8,6	13,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Veterinary fish farming welfare "</b>					
1	Sanitation and hygiene in fish farming	3	360	6,7	10,0
2	Diseases of fish farming	3,4	432	8,0	12,0
3	Hygiene and Sanitation fish farming processing enterprises	3,4	468	8,7	13,0
4	Aquaculture	3	468	8,6	13,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Veterinary-sanitary inspection, safety and quality of food and feed"</b>					
1	Hygiene of milk and milk products	3,4	684	12,7	19,0
2	Hygiene primary processing of animals and products of slaughter	3,4	684	12,6	19,0
3	Dental products of animal and plant foods	3	360	6,7	10,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Veterinary Pharmacy"</b>					

**MASTER DEGREE PROGRAMS**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
1	Pharmacognosy, Pharmaceutical Chemistry and Toxicological Chemistry	3,4	540	10,0	15,0
2	Pharmacy and pharmaceutical technology	3	360	6,7	10,0
3	Clinical Veterinary Pharmacology and Clinical Pharmacy Veterinary	3	396	7,3	11,0
4	Preclinical and clinical studies of drugs	3,4	432	8,0	12,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Veterinary Hygiene and Sanitation"</b>					
1	Waste of animal husbandry and their recycling	4	540	10,0	15,0
2	Veterinary and sanitary facilities	3	432	8,0	12,0
3	Animals ethology	3	360	6,7	10,0
4	Animals health	4	396	7,3	11,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master Program "Methods of biochemical research"</b>					
1	Quality management of the laboratory	4	360	6,7	10,0
2	Modern methods and instruments biochemical studies	3	684	12,6	19,0
3	Special biochemistry	3,4	684	12,7	19,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Microbiological diagnostic methods in veterinary medicine"</b>					
1	Quality management of the laboratory	4	360	6,7	10,0
2	Biology of microorganisms	3,4	684	12,6	19,0
3	Methods for microbiological testing	3,4	684	12,7	19,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Veterinary-sanitary examination of agricultural and food products"</b>					
1	Quality management of the laboratory	4	360	6,7	10,0
2	Hygiene of food and feed	3	504	9,3	14,0
3	Methods of veterinary-sanitary inspection of food and feed	3	468	8,7	13,0
4	Analysis of microbiological hazards in food and feed	4	396	7,3	11,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Pathomorphological diagnostics of animals diseases"</b>					
1	Quality management of the laboratory	4	360	6,7	10,0
2	Pathomorphology animal diseases by type	3,4	684	12,6	19,0
3	Fundamentals of histological techniques and histological research methods	3,4	684	12,7	19,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Research oriented disciplines</b>					
<b>Master program "Scientific fundamental problems of Veterinary Medicine"</b>					
1	Scientific fundamental problems of morphology, cytology and embryology	3	576	10,7	16
2	Scientific fundamental problems of biochemistry and physiology of animals	3,4	576	10,7	16
3	Scientific fundamental problems of microbiology, immunology and biotechnology in veterinary medicine	3,4	576	10,6	16
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
<b>Master program "Scientific applied problems of Veterinary Medicine"</b>					
1	Scientific applied problems of noncontagious pathology of animals	3,4	576	10,7	16,0
2	Scientific applied problems of contagious pathology	3,4	576	10,7	16,0

**MASTER DEGREE PROGRAMS**

№ п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
	of animals				
3	Scientific applied problems of veterinary toxicology, hygiene and sanitary and quality and safety of animal production	3,4	576	10,6	16,0
<i>Total number</i>			1728	32,0	48,0
<i>Total selected by the students</i>			2268	42,0	63,0
Total number of elected part			2808	41,0	62,0
Practical training			288	5,3	8,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			4320	80,0	120,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of humanitarian, social and economic training\**

**Philosophy of science and innovation development.** The philosophical and scientific approaches to the study of science and innovational activities. Philosophy of science: ontological, epistemological dimension. Forms of organization science. Classical, non-classical, postnonclassical ideals of scholarship. Methodology of scientific cognition and innovation. Study of basic scientific forms. The value of basic and applied research strategies. Philosophical foundations of sciences classification. Philosophy of technology: theoretical and methodological aspects. Philosophical understanding of scientific world. The logic of scientific research in the context of contemporary global issues (environmental, technological and social). Axiological dimension of science: the problem of responsibility of the scientist.

**Foreign language in professional activities.** A comprehensive learning of language of profession. Types of language activities: reading, listening, speaking. Formation of skills of dialogue and monologue speech and train students for professional communication in oral and written forms in foreign languages. Learn how to translate specialized texts as a way of adequately presentation of the content of scientific information. Formation of the knowledge and skills necessary to ensure master's communicative ability in the field of professional communication: the ability to organize and carry out scientific conference by the specialty, to participate in the conference and make a scientific lecture, a business meeting or negotiations with foreign counterparts and partners.

**Information technologies in Veterinary Medicine.** The purpose of discipline is to systematize the techniques and methods of data processing with computer technology, also to detect, application and development of advanced, more effective technologies in the automation of data processing steps and the methodical support of new technology research in the field of veterinary medicine.

The main task of discipline is to master modern information computer technologies used in veterinary medicine to highlight research results with sufficient validity and clarity.

##### *1.2. Cycle of natural science (fundamental) training\**

**Comparative morphology, special pathomorphology and judicial Veterinary Medicine.** The discipline studies data on the comparative morphology of organs of various animals in close connection with their functions and development, additionally one studies veterinary and biological issues that arise in law enforcement agencies in pre-trial



investigation and court proceedings, procedural and organizational foundations of forensic veterinary examination and compiling of forensic veterinary documentation.

**Veterinary legislation of Ukraine and international veterinary law.** Discipline examines the theoretical and practical basis of legal and legislative activity in the field of veterinary medicine. Considering the law as "laws of social nature, embodied in the law," this discipline manifests the value of action in the field of veterinary medicine. Study of legally significant, legally regulated activities and transactions that are aimed at satisfying of public and private interests in the veterinary.

**Methodology of research.** Discipline examines the main stages of development of Ukrainian science and higher education, their current status, characteristics of degreeal reformation of higher education with a focus on training Masters, PhD or PhD. Methods of research (historical, biological, zootechnical, veterinary, special), used in veterinary medicine, bioethics of behavior of doctor, researcher, scientist, choosing the topic and forming aims of research, inventions and patents.

### *1.3. Cycle of professional and practical training \**

**Obstetrics, Gynaecology and Animal Reproduction Biotechnology.** Discipline studies obstetric pathology, gynecological diseases in female animals of different species, focusing on their features with modern highly technological breeding and prevention of infertility. Methods of hormonal stimulation of the sexual cycle and biotechnological methods of animal reproduction.

**Special propaedeutics, therapy and prevention of internal diseases.** Examines modern methods of predicting the emergence of non-contagious diseases in animals of different species, schemes of prevention metabolic disorders in high-producing animals, equipment, devices and methods of diagnostic research and therapy in case of internal diseases.

**Surgical Pathology of anesthesiology.** Examines surgical pathology in animals of different species, modern methods, tools and instruments used for diagnostic studies and operative treatment. Modern tools for local anesthesia and narcosis of animals of different species.

**Special epizootiology.** Learn infectious diseases, modern methods of of diagnostics and prophylaxis in conditions of large high-tech livestock farms and poultry farms, non common infections of agricultural, small domestic and wild and exotic animals.

**Global parasitology.** Examines global problems of modern veterinary parasitology, biological features of parasitic diseases pathogens, their distribution in nature, distribution and routes of transmission, methods of diagnosis, prophylaxis and treatment of animals in the case of parasitic diseases.

## **2. ELECTIVE ACADEMIC DISCIPLINES**

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training \**

**Obstetrics, Gynecology and Animal Reproduction Biotechnology.** Discipline studies obstetric pathology, gynecological diseases in female animals of different species, focusing on their features with modern highly technological breeding and prevention of infertility. Methods of hormonal stimulation of the sexual cycle and biotechnological methods of animal reproduction.

**Special propaedeutics, therapy and prevention of internal diseases.** Studies modern methods of predicting the emergence of non-contagious diseases in animals of different species, schemes of prevention of metabolic disorders in high-producing animals, equipment, devices and methods of diagnostic research and therapy in case of internal diseases.

---

**Surgical pathology with the anesthesiology.** Studies surgical pathology in animals of different species, modern methods, tools and instruments used for diagnostic studies and operative treatment. Modern tools for local anesthesia and narcosis of animals of different species.

**Special epizootiology.** Studies non common infections, modern methods of diagnostics and prophylaxis in conditions of large high-tech livestock farms and poultry farms, non common infections of agricultural, small domestic and wild and exotic animals.

**Global parasitology.** Studies global problems of modern veterinary parasitology, biological features of parasitic diseases pathogens, their distribution in nature, distribution and routes of transmission, methods of diagnosis, prophylaxis and treatment of animals in the case of parasitic diseases.

## *2.2. Disciplines chosen by the students*

### *2.2.1. Cycle of professional and practical training \**

#### *Production oriented disciplines*

#### **Master program “Preventive Veterinary Technology of Animal Health Providing”**

**Preventive health technologies of farm animals.** Discipline studies preventive veterinary measures for the emergence of non-contagious and contagious diseases in productive livestock and poultry farms of different ownership, planning epidemic measures, diagnosis of diseases of different etiology, clinical and laboratory studies of biological material, modern technology of growing animals and birds, monitoring the conditions of detention and animal feed and poultry.

**Preventive technologies to ensure the health of horses.** Mastering the disciplines will give the opportunity to acquire knowledge on feeding, housing, breeding, use and maintenance of horses, modern methods of reproduction, including the prevention of non-contagious obstetric and surgical pathology. Modern methods of diagnosis of infectious and parasitic diseases of horses and their means of prevention.

**Preventive health technologies of small domestic and exotic animals.** Discipline studies preventive veterinary measures for the emergence of non-contagious and contagious diseases in small domestic and exotic animals including their feeding and maintenance. Contemporary instrumental and laboratory methods for diagnosis of infectious and noninfectious diseases. Tools and schemes specific prevention of infectious and parasitic diseases. Providing professional assistance and medicines used for the treatment of small domestic and exotic animals.

#### **Master program “Animal welfare of livestock, sheep and goat farming”**

**Innovative technologies of nutrition, genetics and breeding of cattle, sheep and goats.** Discipline is aimed at in-depth study of the properties of feed nutrients absorption and conversion in the body of ruminants. The nutrient requirements depending on the direction and production technology, innovative technologies of feeding ruminants.

**Genetics and breeding of cattle, sheep, goats farming.** Features of karyotypes, hereditary anomalies, interbreed gene polymorphism of quantitative and qualitative features. Modern genetic database in cattle and their use. Veterinary genetics.

**Preventive veterinary technologies of noncontagious diseases of ruminants.** Discipline studies preventive veterinary measures for the emergence of diseases related with metabolic disorders, hormonal disorders, vitamin and mineral nutrition. Prevention of infertility and obstetric pathology in cows, sheep and goats, modern methods of reproduction of ruminants. Prevention of surgical pathology and modern technology in veterinary surgery.

---

**Preventive veterinary technologies of contagious diseases of ruminants.**

Discipline is studying advanced technological schemes of diagnostic tests and prevention of infectious and parasitic diseases of ruminants. Vaccine prophylaxis of infectious diseases of ruminants, the use of serum, immunoglobulin, preparations which have interferonogens action. Prevention of helminthoses and diseases caused by protozoa.

---

### **Master program “Animal welfare pig”**

**Innovative technologies nutrition, genetics and breeding pig.** Discipline is aimed at in-depth study of the properties of feed nutrients absorption and conversion in the body of pigs. The nutrient requirements according to age-sex groups of pigs and production technology, innovative technology feeding pigs. Genetics and breeding in pigs. The theoretical basis of breeding pigs. The task of selection due to the intensification of the industry. Features karyotypes, hereditary anomalies interbreed gene polymorphism, quantitative and qualitative features. Modern genetic database in the pig and their use. Veterinary Genetics.

**Preventive veterinary technology non-communicable diseases of pigs.** Discipline studies preventive veterinary measures for the emergence of diseases associated with metabolic disorders, hormonal disorders, vitamin and mineral nutrition. Preventive measures for prevention of non-communicable diseases calves. Prevention of obstetric pathology in pigs, modern methods of pig reproduction. Prevention of surgical pathology and modern technology in veterinary surgery.

**Preventive Veterinary Technology contagious disease of pigs.** Discipline focused on the study of modern technological schemes diagnostic tests and preventive measures for infectious and parasitic diseases of pigs. Vaccine Infectious Diseases adult pigs and calves, the use of biological products that enhance the natural resistance of the body (serum immunoglobulins preparations possessing interferonogens action). Prevention of helminthoses and entomoses, acaroses, diseases caused by protozoa.

### **Master program “Equine veterinary welfare”**

**Innovative technologies nutrition, genetics and breeding horses.** Discipline aims to provide future professionals in-depth knowledge about the properties of an innovative nature nutrient feed control full feeding horses. The nutrient requirements depending on the direction of the industry (breeding horse breeding, stud, sport horse breeding, horse jobs). Modern technologies of breeding horses. Genetic database breeding and their use. Veterinary Genetics.

**Preventive veterinary technology non-communicable diseases of horses.** Discipline studies preventive veterinary measures for the emergence of diseases associated with metabolic disorders, hormonal disorders, vitamin and mineral nutrition. Prevention of infertility and obstetric pathology in mares, modern methods of breeding horses. Features surgical pathology horses and their prevention. Modern Veterinary Surgery and Anesthesiology especially horses.

**Preventive veterinary technology infectious diseases of horses.** Discipline focused on the study of modern technological schemes diagnostic tests and preventive measures for infectious and parasitic diseases of horses. In the course of study students will learn morphological features and life cycle of pathogens and their systematic position, epizootology, pathogenesis and formation of immunity in horses. Prevention helminthoses, acaroses, entomoses and diseases caused by protozoa.

### **Master program “Poultry veterinary welfare”**

**Innovative technologies nutrition, genetics and breeding of poultry.** The discipline studying poultry need the nutrient feed, modern technology feeding of different species (chickens, ducks, geese, turkeys, pheasants, guinea fowl, quail), depending on the direction of production (meat or poultry egg) control full feeding. Features of breeding birds. Methods for determining the performance and value of poultry breeding, Creating lines and crosses. Veterinary Genetics. Methods for genetic studies, chromosomal and genomic mutations determining mutagenic environment.

**Preventive veterinary technology non-contagious diseases of poultry.** Discipline is studying advanced circuit techniques and means of preventing non-

---

communicable diseases during the growing broiler poultry and egg productivity directly (prevention of metabolic disorders, vitamin and mineral nutrients). Poisoning prevention of poultry from harmful air substances (ammonia, hydrogen sulfide, carbon dioxide) and feed components of natural and anthropogenic approval (mycotoxins, heavy metals, sodium chloride, urea).

**Preventive Veterinary Technology contagious poultry diseases.** Discipline focused on the study of modern technological schemes diagnostic tests and preventive measures for infectious and parasitic diseases. Vaccine Infectious Diseases parent flock birds, chickens and egg productivity when growing broilers. Application of biological products that enhance natural resistance and resistance (immunoglobulins preparations possessing interferonogens action). Prevention of helminthoses, acaroses, entomoses, diseases caused by protozoa.

#### **Master program “Veterinary welfare of dogs and cats”**

**Innovative technologies nutrition, genetics and breeding of small animals.** Discipline aims to provide future professionals in-depth knowledge of innovative character of the need for nutrient feed composition feed control full feeding dogs and cats. Dog breeds, Dog breeding business and domestic breeds of cats. Application of inbreeding in the breeding of small animals, methods preserve the gene pool of dogs and cats. Veterinary Genetics.

**Preventive veterinary technology non-communicable diseases of dogs and cats.** Discipline studies preventive veterinary measures for the emergence of diseases associated with metabolic disorders, hormonal disorders, vitamin and mineral nutrition in dogs and cats. Prevention of obstetric pathology in dogs and cats, methods of hormonal regulation of the sexual cycle in dogs and cats. Traumatology, dentistry, orthopedics, microsurgery. Prevention of surgical pathology and modern technology in veterinary surgery.

**Preventive veterinary technology infectious diseases of dogs and cats.** Discipline aims to study modern methods of diagnostic tests and preventive measures for infectious and parasitic diseases of dogs and cats. In the course of study students will learn morphological features and life cycle of pathogens and their systematic position, etiology, pathogenesis and formation of immunity in dogs and cats. Prevention helminthoses, acaroses, entomoses, diseases caused by protozoa.

#### **Master program “Veterinary care of exotic and wild animals”**

**Housing, feeding and reproduction of exotic and wild animals.** The discipline studying the characteristics of a place in the animal world and the importance for humanity and environment at all major species of exotic and wild animals (wild Artiodactyles and odd-toed, primates, animals, rodents, reptiles birds). Features of housing, feeding, reproduction in captivity.

**Modern diagnosis and treatment of non-communicable diseases exotic and wild animals in the non-contagious diseases.** Learn the latest methods of research animals, such as endoscopy (laparoscopy, gastroscopy, esophagogastroduodenoscopy, cystoscopy, renoscopy, uteroscopy, laryxbronchoscopy, thoracoscopy, rectokolonoscopy, visual biopsy), ultrasound (U.S.), magnetic resonance imaging (MRI) features cardiography, phonocardiography and radiological studies. Peculiarities of non-communicable diseases of organs and body systems and general principles of surgery in different species of exotic and wild animals.

**Infectious diseases of wild and exotic animals.** The discipline studies the most common dangerous general and specific for each type of animal diseases of viral, bacterial, and fungal origin and neglected diseases that threaten livestock in general.

---

**Parasitic diseases of wild and exotic animals.** Discipline introduces undergraduates from diseases that are caused by worms, mites, insects, especially their distribution, clinical manifestation in different species of exotic and wild animals, and measures to combat them.

#### **Master program “Fish farming welfare”**

**Hygiene and Sanitation in fish farming.** The study involves the development of students' discipline of modern techniques, methods and techniques of veterinary and sanitary requirements for breeding, cultivating, maintaining and gain that fish in ponds, lakes, rivers, reservoirs and estuaries, as well as artificial water bodies, the organization of veterinary reliable quality control water, feed and feed additives and protection of water bodies from toxic pollutants, the use of modern means of disinfection and decontamination and desinvasion of fishery ponds, compliance with veterinary and sanitary measures to protect public health against diseases common to man and animals.

**Diseases of fish.** Discipline shaping students' knowledge of complex etiology, pathogenesis and methods of prevention and treatment of infectious and parasitic diseases of freshwater and marine fish and other aquaculture facilities through the use of various drugs, disinfectants, improve water quality, aquatic immune prophylaxis and acclimatization. Special attention is paid to the diagnosis and prevention of non-communicable diseases freshwater fish related to changes in gas composition and hydrochemical regime of water, metabolic disorders, negative impact on the body of xenobiotics, heavy metals, radionuclides, sewage livestock enterprises.

**Hygiene and Sanitation fish processing companies.** Discipline provides knowledge to provide veterinary hygiene and sanitation requirements for basic technological processes of fish and other aquatic organisms and aquatic plants in fish processing plants for frozen fish and seafood, canning, smoked, dried, drying and pickling fish, making preparations. The questions on the use of different disinfectants, schemes and methods of disinfection for storage and processing of fish and seafood, as specified risks reducing the quality of aquaculture products processing facilities, discusses how to prevent poisoning of people substandard food processing.

**Aquaculture.** Discipline examines organizational structure ponds and industrial farms use biological basis of complex measures of intensification of aquaculture aimed at increasing biological productivity and fish productivity of ponds and technology for seed cultivation facilities, production of planting material and commercial fish in the warm-water and cold-water ponds and industrial aquaculture with regard systems, forms and cycles of fisheries management.

#### **Master program “Veterinary-sanitary inspection, safety and quality of food and feed”**

**Hygiene of milk and dairy products.** Discipline regards health requirements for: livestock animals used are milk, livestock buildings, stalls, equipment, identification of animals and herds, Hygiene during milking, reception and transportation of persons involved in the production of raw milk supply. Highlights the veterinary inspection dairy farms, milk collecting centers and other entities engaged in the primary production of milk. Requirements for obtaining good quality milk. Veterinary requirements concerning import into Ukraine of milk and dairy products. Hygiene in the use of modern technologies for drinking kinds of milk and dairy products.

**Hygiene primary processing of animals and products of slaughter.** Discipline regards veterinary and sanitary requirements for primary processing of animals and slaughter products at all stages from breeding animals and ending production of meat products. Discipline studies sanitary requirements processes: slaughter, primary processing of animal carcasses and different types of poultry technological processing

---

hides, intestinal raw materials, by-products, endocrine-enzyme raw food animal fats, sausages, canned Jar. Considered as hygiene requirements for storage facilities, refrigerators and transport of meat and meat products, household facilities, personal hygiene of staff.

**Dental products of animal and plant foods.** Discipline highlights issues of health of fish and fish products, honey, eggs, plant products, animal feed, to ensure their safety, ability to prevent potential hazards associated with the consumption of these products, analysis and mastery of modern methods of veterinary-sanitary examination.

### **Master program “Veterinary Pharmacy”**

#### **Pharmacognosy, Pharmaceutical Chemistry and Toxicological Chemistry.**

Pharmacognosy provides the knowledge, skills and working knowledge of medicinal raw materials of plant origin, the composition of biologically active compounds and methods for their identification, the establishment of high quality and purity of practical use as a source of modern effective drugs for the treatment of animals in various pathologies. Pharmaceutical Chemistry occupies a leading position in the sector of pharmaceutical sciences, as trains professionals to address the twin problems: the creation of new medicines and quality control of drugs. Its main aim is to create a methodology and quality assessment of drugs based on general and specific patterns of pharmaceutical chemistry as an applied discipline to perform professional tasks of Veterinary Medicine degree. Toxicological Chemistry provides the basic knowledge, skills, skills for working in the field of chemical toxicology, forensic toxicology, hygiene research, forms the basis of knowledge of the biotransformation of xenobiotics, toxicodynamics toxicokinetics and toxic substances, mechanisms of toxic action of poisons, the differential diagnosis of poisoning animal natural and artificial methods of detoxification and specific antidote therapy.

**Pharmacy and pharmaceutical technology.** Pharmacy, a discipline that aims to deepen the theoretical knowledge, familiarity with regulatory and legislative documents regulating the development, production, sale and use of veterinary drugs, get practical skills and prepare graduates to work independently. The subject of discipline is the system of veterinary pharmaceutical drugs, particularly Licensing Terms pharmacy business, retail sales rules, regulations, governing state control and supervision over the quality veterinary preparations and substances regulations transportation and storage of veterinary drugs. Pharmaceutical technology – the science of the theoretical foundations and production processes of processing medicinal products prepared medication storage and dispensing. The objectives of the discipline is the study of the theoretical foundations and practical issues of making drugs in pharmacy and industrial production; familiarization with equipment and instrumentation used in pharmacies and pharmaceutical companies, identifying the right kind of packaging, exploring the normative documentation in the finished product.

**Clinical Veterinary Pharmacology and clinical veterinary pharmacy.** Clinical Pharmacology and Pharmacy – integrated applied science that combines pharmaceutical and clinical aspects knowledge about medicines. Its main task is to establish the theoretical foundations and methodological approaches of rational use of medicines. In studying the discipline, students will be acquainted with the basic principles of medical and veterinary ethics, basic types of documentation, mastering the basic techniques of laboratory and instrumental examination of patients, total absorption syndromology and clinical sympatology of most common internal diseases, learning general methodology and principles of selection of drugs for effective drug therapy, the study of clinical manifestations of drug side effects.

**Preclinical and clinical studies of drugs.** Purpose of nonclinical studies is to determine the toxicity and therapeutic efficacy of future drug, its effects on major body systems, and installation of the possible adverse effects on laboratory animals and test

---

facilities. Implementation of Good Laboratory Practice (GLP), which guarantees the quality of the emerging drugs of high therapeutic effectiveness; GLP - a system of rules that cover the organizational process and the conditions under which non-clinical studies are planned, performed, provided their monitoring, a registration and storage provided a report on the test results. Clinical studies conducted to identify or confirm the clinical pharmacodynamic effects of the investigational drug or detect all adverse reactions to it, and to study absorption, distribution, biotransformation and excretion of the drug. Such studies should be conducted in compliance with Good Clinical Practice (GCP), which are governed by the rules of the advanced clinical trials.

#### **Master program “Veterinary Hygiene and Sanitation”**

**Waste of animals and recycling.** The discipline studies the composition, properties and sanitary evaluation of animal waste, modern methods of waste management facilities, sanitary and veterinary-sanitary requirements for systems and methods for their transportation, storage, recycling and safe disposal.

**Veterinary and sanitary facilities.** Discipline provides students with knowledge of the latest tools and equipment used for disinfection, disinfestation, deodorants and other methods of animal sanitation facilities. The purpose of discipline is also of students' skills in today's job disinfection facilities and sanitary facilities for livestock territory of the objects and the environment from infectious and parasitic diseases of animals.

**Ethology animals.** Discipline is studying animal behavior, her life signs, the impact of genetic factors, housing conditions, feeding, operation in different species, sex and age groups of animals and technology, their adaptation, acclimatization, social behavior in the herd, depending on the technology of animal production environment, anthropogenic factors on animals.

**Animal Health.** Discipline measures and exploring ways to ensure animal health companies in the intensive technologies of milk, meat, chicken, table eggs and receipt of breeding material. Among the issues to be considered, prevention of animal diseases caused by violation of housing, feeding, breeding, care and use.

#### **Master program ”Methods of biochemical research”**

**Quality management of the laboratory.** Discipline examines national and international standards for the organization of chemical analytical laboratories, evaluation of fitness techniques, traceability and uncertainty of the results. The knowledge gained will enable professionals already sufficiently understood in the laboratory and safely perform analytical measurement techniques.

**Modern methods and instruments biomedical research.** Discipline is studying advanced electrochemical, spectrometric and chromatographic techniques and instrumentation laboratory tests used to monitor the quality and safety of agricultural products, food products and environmental objects. It provides basic knowledge for laboratory professionals.

**Special biochemistry.** There is a basic discipline within which we study in depth knowledge of the biochemical processes occurring in living organisms, the pathological changes poisoning chemicals and manufacturing techniques and keeping livestock production. Deepening knowledge of biochemistry play a special role in the formation of professional biology and contribute to better learning of sciences master's program.

#### **Master program “Microbiological diagnostic methods in animal husbandry and Veterinary Medicine”**

**Quality management of the laboratory.** Discipline examines national and international standards for the organization of chemical analytical laboratories, evaluation

---



of fitness techniques, traceability and uncertainty of the results. The knowledge gained will enable professionals already sufficiently understood in the laboratory and safely perform analytical measurement techniques.

**Biology of microorganisms.** Discipline provides for the formation of future professionals in environmental and biological thinking, knowing their possible effect phenomena caused by microorganisms (viruses) in animals, raw foods and various environmental objects.

**Methods for microbiological studies.** The basic goal of discipline is to master modern methods of detecting microorganisms and viruses. Diagnosis of bacterial and viral infections in animals. Modern immunological (serological) methods for diagnosis of infectious diseases, determine the tension immunity.

### **Master program “Veterinary-sanitary examination of agricultural and food products”**

**Quality management of the laboratory.** Discipline examines national and international standards for the organization of chemical analytical laboratories, evaluation of fitness techniques, traceability and uncertainty of the results. The knowledge gained will enable professionals already sufficiently understood in the laboratory and safely perform analytical measurement techniques.

**Hygiene of food and feed.** Discipline involves learning the basics of health legislation in the production of food and feed in the EU and Ukraine, hygiene and quality control of meat and meat products, milk and dairy products, fish and fish products, eggs, vegetable and feed products to all stages of production.

**Methods of veterinary-sanitary inspection of food and feed.** The discipline involves the examination requirements of legal acts of Ukraine regarding the research in the laboratories of veterinary-sanitary examination. Studies also accelerated (screening) and arbitration methods of veterinary-sanitary inspection of food and feed sampling procedure.

**Analysis of microbiological hazards in food and feed.** In the discipline presents an analysis of microbiological risks associated with animal products, information on infections and food poisoning arising from the use of food, microorganisms that cause them and lead to spoilage of food and feed; microbiological methods for their detection.

### **Master program “Pathological diagnostics”**

**Quality management of the laboratory.** Discipline examines national and international standards for the organization of chemical analytical laboratories, evaluation of fitness techniques, traceability and uncertainty of the results. The knowledge gained will enable professionals already sufficiently understood in the laboratory and safely perform analytical measurement techniques.

**Pathomorphology animal diseases by type.** In the discipline of data considered pathomorphological changes in diseases of different etiology (bacterial, viral, parasitic etc.) in different species of animals, large and small ruminants, horses, pigs, dogs, cats, exotic animals and birds. We study the method of organizing and conducting postmortem autopsy of animals of different species on the basis of the current legislation of Ukraine. Methodological and methodical features performances postmortem diagnosis and formulating a conclusion about the cause of death of the animal performed based preventive and therapeutic measures.

**Fundamentals of histological techniques and histological research methods.** In the discipline of data examined histological laboratory equipment, preparation utensils, tools, devices, fixing agents, dyes and reagents for histological studies and data about the stages of making histological preparations (selection of material, its fixation, washing, drying, packing, production cuts and coloring different methods), the creation of the

---

painted sections in balsam or other medium. In addition, students are introduced to the safety at work in histological laboratory microscopy technique made histopreparations and documentation of research results.

*Research oriented disciplines*

**Master program “Scientific fundamental problems of Veterinary Medicine”**

**Scientific fundamental problems of morphology, cytology and embryology.**

Discipline provides an in-depth study of the structural and functional relationship between organs, apparatus and systems in species and age factors. Electron-microscopic structure and microstructure and morphometric parameters of various cell types.

**Scientific fundamental problems of Biochemistry and Physiology.** The discipline studies cells and cell organelles, metabolic processes in cells of tissues of animal body, metabolism in the body and cell under the different conditions (dormancy, anesthesia, cryopreservation, etc.). Methods for the regulation of biochemical processes in the cell and in its organelles. Flow of physiological processes in animal organism and their changes under different conditions environment.

**Scientific fundamental problems of microbiology, immunology and biotechnology in veterinary medicine.** The basic goal of discipline is to master the modern methods of detection bacteria and viruses, the formation of future professionals in ecological and biological thinking, cognition by them the essence of every possible phenomena caused by microorganisms (viruses) in animal organism. Methods of immunological research, assessment of the immune status of the organism and methods of its correction. Autoimmune reactions. Biochemical technologies in the production of antibiotics, enzymes, hormones, proteins and amino acids, feed additives and protection of animals from diseases.

**Master program “Scientific practical issues of Veterinary Medicine”**

**Research applied problems of non-contagious disease of animals.** Discipline studies the causes, characteristics of development and special methods of instrumental diagnostics internal diseases in today's management of livestock industries in order to develop effective means of prevention and implementation prophylaxis measures. Scientific approaches to solving the problems of infertility and implement economically sound and effective schemes and reproduction of animals. Investigation of the causes, development of diagnostic tests and implementation of effective measures to prevent surgical pathology.

**Research Applied Problems contagious diseases of animals.** Discipline provides training for master-researcher who has knowledge of modern methods of diagnostics of infectious and parasitic diseases of animals (immuno-chemical and ELISA, serological, bacteriological and virological studies), studies of the immune system and evaluate the degree of disorder, prediction epizootology situation and evaluation of its risk to the animals.

**Research applied problems of veterinary toxicology, hygiene and sanitation and the quality and safety of animal products.** The discipline studying methods of toxicological studies in veterinary medicine, toxic effects on animals and natural toxicants anthropogenic origin in order to develop acceptable levels of toxicants in feeds and animal products; scientific problems of hygiene and sanitation on modern farms (how safe disposal of animal waste, sewage, processing of animal products, disposal of disinfectants, antibiotics) risk analysis in the production and processing of animal products, methods of quality and safety of animal products.

---

**EDUCATIONAL AND RESEARCH INSTITUTE  
OF BIORESOURCES QUALITY AND LIFE SAFETY**

**Director** – doctor of biological sciences, professor, corresponding member of NAAS of Ukrain Melnychuk Sergiy Dmitrovich

**Tel: (044) 527-86-39**

**E-mail: director@quality.ua**

**Location: educational building number 12, room. 315**

**FACULTY OF FOOD TECHNOLOGIES AND QUALITY MANAGEMENT OF PRODUCTS  
OF AGRICULTURAL INDUSTRIAL COMPLEX**

**Dean** – Bal-Prilipko Larissa Vatslavivna, doctor of technical sciences, associated professor

**Phone: (044) 527-89-509**

**E-mail: bplv@mail.ru**

**Location: educational building number 12, room. 305**

**Faculty is carried out training of masters in the field:**

**8.05170104 “Technologies of Preservation, Conservation and Processing of Meat”**

**Department in charge of training gradulators:**

**Technology of meat, fish and sea products**

**Phone : (044) 527-88-85**

**E-mail: t\_lebskaya@ukr.net**

**Head of department** – doctor of technical sciences, professor Lebska Tatiana Kostyantynivna

**8.05170105 “Technologies of Preservation and Processing of Water Bioresources”**

**Department in charge of training gradulators:**

**Technology of meat, fish and sea products**

**Phone : (044) 527-88-85**

**E-mail: t\_lebskaya@ukr.net**

**Head of department** – doctor of technical sciences, professor Lebska Tatiana Kostyantynivna

**8.18010010 “Quality, standardization and certification”**

**Department in charge of training gradulators:**

**Agricultural production standardization and certification**

**Phone : (044) 527-82-78**

**E-mail: standardization@ukr.net**

**Head of department** – doctor of agricultural sciences, professor Gumeniuk Galina Denisovna

---

**Master Training**  
**in specialty “TECHNOLOGIES OF PRESERVATION, CONSERVATION**  
**AND PROCESSING OF MEAT”**  
**Branch of knowledge “Food industry and agricultural production processing”**

**Form of training, licensed number of students:**

- |                     |    |
|---------------------|----|
| - full-time study   | 30 |
| - by correspondence | 30 |

**Term of study** 1,5 years

**Credits** 90 ESTS

**Language of training** Ukrainian

**Qualification of graduates** master's degree in meat storage, conservation and processing

**The training concept**

For quality conducting of raw meat storage, preservation and processing it is necessary to extend the network of specialists training and upgrading this direction.

Today there has been improved the efficiency of new technologies implementation.

It is clear that the successful practical solution of important for Ukraine meat processing industry problems is possible through training engineers in specialty “Meat storage conservation and processing” at the “Master’s” educational qualification level.

The factors that determine the demand in Master’s Degree training in “Meat storage conservation and processing” are:

- high quality traditional and new kinds of food production increasing;
- implementation and development of new intensive technologies
- new meat processing areas appearance, which are associated with new resource-saving technologies application

**Production oriented master program**

***Master Program in “Meat and meat products processing”***

The program is aimed at forming the theoretical knowledge and practical skills of modern technology in storage, preservation and processing of meat and adaptation requirements for raw materials and finished products to international and European requirements.

**Sphere of graduates employment**

The main program task is to train the ability of meat storage conservation and processing technology engineers to work in meat processing and related industries enterprises, organizations and companies. To perform their functions in labour organization, staff management, products manufacturing, engineering and investigations of new and improvement of existing technologic methods for the manufacturing of meat finished and half – finished products.

**Master program of applied biology**  
**specialization “Laboratory work”for expert control sphere of employment**

***Master Program “Biochemical research methods”***

Master Degree Programs “Biochemical research methods” performed within the specialization “Laboratory skills”

---

The program's main task is to teach future masters to perform advanced biochemical, physico-chemical and molecular biological research methods for their daily work optimal application.

The such Master's training will provide specialized laboratories by qualified experts in the field of agricultural products, food and environmental objects quality and safety control.

### **Graduates employment field**

After master's program graduation the experts will be able to work in the specialized veterinary laboratories, diagnostic centers, environmental monitoring laboratories, analytical laboratories of companies engaged in agricultural and food products storage, marketing, processing.

### **Practical training**

Student's practical training is an integral part of the educational – training process for the EQL "Master" in specialty 8.05170104 "Technologies of Preservation, Conservation and Processing of Meat".

During the practical training practical activities, practical skills, abilities' and competencies of the future specialist in meat processing industry are founded.

At the Master educational period at the University, they are passing two industrial practical training courses. The practical courses are different from each other by purpose, content and duration.

Practice is held at the leading meat processing plants after fundamental, general engineering, socio-economic disciplines studying.

Students have practice at processing enterprises regardless of their ownership. Practice databases selecting is taking into account specialization, technical and engineering level and orders for specialists training.

The main practice training bases are – SD NULES of Ukraine TRE "Velykosnitynske named after A. Muzychenko"( slaughtering plant, educational, scientific and industrial laboratory of meat and meat products technology), SD NULES Ukraine Nemishaivo Agricultural College (Nemishaivo fish section) "Polis LTD", PE "Marshal", "PE "Drygalo", Kyiv region, t. Belaya Tserkov, "Hlobynskyy meat plant LTD" Poltava region, "Cherkasy food Company LTD" Cherkasy region, J-SC "Kozyatinsky meat", "Gaysinsky meat LTD" Vinnitsa region, "Chernihiv meat", "Skvortsov LTD" AR Crimea.

### **Proposed Topics for Master Theses**

1. The poultry products technology improvement multicomponent brines applying under conditions of "Cherkasy Food Company, LTD" t. Cherkasy.

2. The meat products technology with vegetable additions development under conditions of "Hlobynskyy meat" Poltava region.

3. The animal protein drugs application in the meat products technology under conditions of "Polis LTD" Kyiv region.

4. Content of nutrients in ostrich meat research in dependance of the morphological structure at ostrich farm conditions CJ-SC "Agro-Soyuz" Dnepropetrovsk region.

5. Improving technology of cooked smoked pork products under conditions of "Ahrotehspilka Ukraine LTD" Kyiv region.

6. Improvement of the meat pastes enriched by functional ingredients under conditions of "Cherkasy food company LTD" t. Cherkasy

7. The research of enzymes drag impact at the half- finished natural products structural characteristics under conditions of private company "Kozyatinsky m' yasokombinat", Vinnitsa region.

---

**MASTER DEGREE PROGRAMS**

8. The pork products technology improvement by multicomponent brines application under conditions of private company “Kozyatinsky m' yasokombinat”, Vinnitsa region.

9. The plant extracts application efficiency in pastes technology under conditions of private company “Kozyatinsky m' yasokombinat”, Vinnitsa region.

10. The preservative agents application efficiency in storage technology of meat and meat products under conditions of “Skvortsov LTD” AR Crimea

**Academic rights of applicants for a master program**

In addition to the specialty “Technologies of Preservation, Conservation and Processing of Meat” entrants with a bachelor degree diploma in the direction “Food Technology and Engineering” can continue education under the specialty knowledge **at knowledge field “Food industry and agricultural production processing”**:

- 8.05170105 – “Technologies of Preservation and Processing of Water Bioresources” (see p. 169);

**under the specialty at knowledge field 1801 “Specific categories”:**

- 8.18010010 – “Quality, standardization and certification”, (see p.176)
- 8.18010021 – “Pedagogy of Higher School”(see p. 434)
- 8.18010018 – Administrative management (see p. 397)
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Technologies of Preservation, Conservation and Processing of Meat “**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	54	1,0	1,5
2	Philosophy of science and innovation development of nature and society	1	54	1,0	1,5
<i>Total number</i>			108	2,0	3,0
<i>1.2. Cycle of natural scientific (the fundamental) training *</i>					
1	Modern research methods in industrial branch	2	144	2,7	4,0
2	Labor protection in industrial branch	1	252	4,7	7,0
<i>Total number</i>			396	7,4	11,0
<i>1.3. Cycle of professional and practical training*</i>					
1	Actual problems of the industrial branch	1	360	6,7	10,0
2	Meat technology preservation and storage	2	360	6,7	10,0
3	Biologically active agents from animal material	3	144	2,7	4,0
<i>Total number</i>			864	16,1	24,0
Total according to regulatory part			1368	25,5	38,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of professional and practical training*</i>					
1	Technological equipment operation	2	144	2,7	4,0
2	Technological calculations, accounting and reporting	2	144	2,7	4,0
3	Electric power supply in the industry	3	144	2,7	4,0
4	Technological processes optimization	2	144	2,7	4,0
<i>Total number</i>			576	10,8	16,0
<i>2.1.2. Cycle of humanitarian, social and economic training*</i>					
1	Strategy for stable development of nature and	1	36	0,7	1,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				national	ECTS
	society				
2	Agrarian and environmental law	1	36	0,7	1,0
3	World agriculture and food resources	1	36	0,7	1,0
4	International standardization and certification of technology, raw materials and finished products	1	36	0,7	1,0
<i>Total number</i>			<i>144</i>	<i>2,8</i>	<i>4,0</i>
2.2. Disciplines chosen by student					
2.2.1. Cycle of professional and practical training*					
Production oriented specialization					
Master Program "Meat and meat products processing"					
1	Pet food technology	3	216	4,0	6,0
2	Heat supply industry enterprises	3	216	4,0	6,0
<i>Total selected by the students</i>			<i>432</i>	<i>8,0</i>	<i>12,0</i>
Master Program "Biochemical research methods"					
1	Special biochemistry	3	162	3,0	4,5
2	Modern methods and instruments of biochemical research	3	162	3,0	4,5
3	Laboratory activities quality management	3	108	2,0	3,0
<i>Total selected by the students</i>			<i>432</i>	<i>8,0</i>	<i>12,0</i>
Total number of elected part			1368	26,7	35,0
Practical training			360	6,7	10,0
Writing and defense of master's thesis			360	6,7	10,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

*1.1. Cycle of humanitarian social and economic training\**

**Business foreign language.** In connection with Ukraine's integration into European society, the spread of networking and contacts in the field of public administration, foreign language increases the effectiveness of mutual partnership contributes to understanding the parties and strengthens the relationship between the different countries. Discipline is intended to form the skills and knowledge in English language in the daily communication between various countries representatives on different professional topics, to teach students for informational written exchange, to take part in projects and discussions, participation in international conferences.

**Philosophy of science and innovation development of nature and society.** In the course highlights the specificity of philosophy of science and innovation development as a special type of human knowledge, presents the major trends in characteristics of the historical development and methodology of philosophy science main problems solution. The methodological, structural, ideological – value principles and characteristics of scientific knowledge, modern philosophical analysis the global and domestic science, the prospects for their development and interaction with other spheres of social life are studied

*1.2. Cycle of natural science (fundamental) training\**

**Modern research methods in industrial branch.** The program includes the study of the basic principles of research methodology in the food industry, the modern classification of experiments, methods of selection, systematization, scientific information and research results analysis, the order of research work and intellectual property rights registration.

**Labor protection in industrial branch.** Health maintaining and promoting methods for, diseases preventing and professional capacity providing. Principles of selection exercise their arrangement and sequence of intended use. Healthy lifestyle. Methods and tools for the professional development of significant mental and physical qualities. Methods of psychophysical training. Rules to prevent physical fatigue, overtraining, overexertion, and other manifestations of the crisis. Methods of self monitoring of health, physical development and operation of functional systems.

*1.3. Cycle of professional and practical training\**

**Actual problems of the industrial branch.** Program envisages advanced study of theoretical and practical problems of modern resources saving technologies of new types meat and meat based combined products and their storage life increasing.

**Meat technology preservation and storage.** Main task of discipline is to improve knowledge in meat and meat products preserving processing, new canning and storage technologies methods mastering the aimed at losses reducing, the formation of knowledge and practical skills to improve core processes and scientific approach to the selection of storage technologies and preserving meat products.

**Biologically active agents from animal material.** During the discipline study is expected to provide for future professionals, information about different chemical nature basic properties of biological substances and composition, which are incorporated into raw animals, using these substances in the biologically active agents production. Students have been reviewed toe characteristics of raw materials for biologically active agents production, harvesting rules, primary processing, preservation and transportation of endocrine-enzyme raw materials. Students get the knowledge with the technology of biologically active additives from animal raw materials.

## **2. ELECTIVE ACADEMIC DISCIPLINES**

### *2.1. Disciplines chosen by University*

#### *2.1.2. Cycle of humanitarian, social and economic training\**

**Strategy for stable development of nature and society.** Discipline provides formation of knowledge about optimization and harmonization of relations between humans and the environment, creating theoretically reasonable steps to stabilize and improve the environmental situation in the contemporary socio-economic conditions. Any – human activity affect the environment, and biosphere deterioration is dangerous to all living, including humans. All these put forward the problem of our planet biosphere preservation. A comprehensive study of existing problems of man's relationship with the environment should provide a strategic approach to address both immediate and prospective planetary mankind problems.

**World agriculture and food resources.** Students training on orientation in actual problems of the global food system, make informed decisions to improve the competitiveness of domestic agricultural enterprises in domestic and foreign markets.

**International standardization and certification of technology, raw materials and finished products.** At the present stage of society and its productive forces development, standardization is becoming as an important means to improve production efficiency and product quality. Under modern conditions products, production manufacturing standardization and certification quality management systems in the food industry is increasing. This necessity is related to the increasing demand for its products in Ukraine and abroad. The discipline learning provides meeting consumers requirements on product quality and safety with continued growth regard production value and of trade turnover between countries. All it requires mastering methods to increase competitiveness, new, innovative products creation stimulate.

---



*2.1.1. Cycle of professional and practical training\**

**Technological equipment operation.** The educational program include the study of theoretical and practical issues related to the operation of typical special processing equipment which is used in meat production it's repair and installation.

**Technological calculations, accounting and reporting.** During the discipline study future professionals are expected to prepare for independent effective professional activity, perform calculations of basic raw materials, auxiliary materials and finished products, the main production equipment using computer technology, to use knowledge in terms of implementation and optimization of production processes, make rational technological solutions , analyze the production situation.

**Electric power supply in the industry.** The educational program includes the study of electrical machines, transformers, lighting, power supply of the food industry, saving electricity.

**Technological processes optimization.** The educational program includes the study of theoretical and practical issues typical technology optimization, aimed at identifying the best conditions under the chosen process quality criterions. During study of discipline future professionals are planned to provide knowledges about food production processes optimization models. And also find out the most important methods of optimization and with their help to learn modeling of processes stage, production sites hardware design. Based on estimated parameters of process or devices design it is possible to select those of them which can use to maximize technological effect in the planned production volume.

*2.2. Disciplines chosen by Students*

*2.2.1. Cycle of professional and practical training\**

*Production oriented master program*

**Master Program “Meat and meat products processing”**

**Pet food technology.** Program provides theoretical and practical study of modern manufacturing technologies of feed and feed additives. Methods for selection of the optimal variants for specific natural and economic conditions in order to increase production and improve feed quality and efficiency of their use.

**Industry enterprises heat supply.** Program provides the study of theoretical foundations of thermodynamics, heat and mass transfer theory, rational use of thermal energy and environment protection.

**Master Program “Biochemical research methods”**

**Special biochemistry.** Is a basic discipline within improving knowledge of biochemical processes occurring in living organisms, the poisoning chemicals pathological changes and processing and livestock production preservation. In-depth knowledge of biochemistry play a special role in the professional formation of and facilitate better learning of sciences master's program.

**Modern methods and instruments of biochemical research.** Studies modern electrochemical, spectrometric and chromatographic techniques and instrumentation laboratory tests used to monitor the quality and safety of food and agricultural products and environmental objects. It provides basic knowledge for laboratory professionals.

**Laboratory activities quality management.** Examines national and international standards for the organization of chemical analytical laboratories, evaluation of the suitability techniques, traceability and uncertainty of the results. Received knowledge will allow to work professionals in the laboratory and safely perform analytical measurement techniques.

---

**Master Training**  
**in specialty “TECHNOLOGIES OF PRESERVATION AND PROCESSING OF**  
**WATER BIORESOURCES”**  
**Branch of knowledge “Food industry and agricultural production processing”**

**Form of training, licensed number of students:**

- |                     |    |
|---------------------|----|
| - full-time study   | 30 |
| - by correspondence | 30 |

**Term of study** 1,5 years

**Credits** 90 ESTS

**Language of training** Ukrainian

**Qualification of graduates** master's degree in preservation and processing of water bioresources

**The training concept**

Competence of professional's by EQL “Master” in specialty “Technologies of preservation and processing of water bioresources” is defined by high professional potential and training for the activity at the food industry enterprises. The program aims at forming master's theoretical knowledge and practical skills of modern technology in fish and seafood storage, preservation and processing and adaptation international and European requirements for raw materials and finished products.

**Production oriented master program**

***Master Program in “Fish and seafood storage, preservation and processing technology”***

The program aims at forming master's theoretical knowledge and practical skills of modern technology is fish and seafood storage, preservation and processing and adaptation international and European requirements for raw materials and finished products.

**Sphere of graduates employment**

The main objective of the program is to train processing engineers in technology of fish and seafood storage, preservation and processing, who are able to work at seafood processing plants and vessels, a scientific – research institutions, including the Southern scientific – research institute of fisheries and oceanography, Ministry of Agrarian Policy and Food of Ukraine and the State Agency of Fisheries of Ukraine subdivisions.

**Master program of applied biology**  
**specialization “Laboratory work” for expert control sphere of employment**

***Master Program “Biochemical research methods”***

Master Degree Programs “Biochemical research methods” performed within the specialization “Laboratory skills”

The program's main task is to teach future masters to perform advanced biochemical, physico - chemical and molecular biological research methods for their daily work optimal application.

The such Master training will provide the qualified experts specialized in laboratories in the field of agricultural products, food and environmental objects quality and safety control.

---

### **Sphere of graduates employment**

After master program graduation the experts will be able to work in the specialized veterinary laboratories, diagnostic centers, environmental monitoring laboratories, analytical laboratories of companies engaged in agricultural and food products storage, marketing, processing.

### **Practical training**

Student's practical training is an integral part of the educational – training process for the EQL “Master” in specialty 8.05170105 “Technologies of Preservation and Processing of Water Bioresources”. During the practical training practical activities, practical skills, abilities' and competencies of the future specialist fish processing industry are founded.

At the Master educational period at the University, they are passing two industrial practical training courses. The practical courses different from each other by purpose, content and duration

Practice is held on the leading fish processing plants after fundamental, general engineering, socio - economic disciplines studying.

Students have practice at processing enterprises regardless of their ownership. Practice databases selecting is taking into account specialization, technical and engineering level and orders for specialists training.

The main practice training bases are: “Proliv LTD” t. Kerch, AR Crimea, “Simferopol fish-processing plant named after Kirov” AR Crimea, “Kerch fish-processing plant LTD” AR Crimea, “Fish manufactory LTD” Kyiv region, “Alaska LTD” Kyiv region, “Sea Pearl” AR Crimea, “Berdyansk fish-processing plant LTD”, Zaporozhye region, J-SC “Ochakov fish-canning factory”, Mykolaiv region, J-SC Chernigov company fish products processing and trade “Chernihivryba” Chernihiv region, “Fish proctssing technology” Zhytomyr region. and others.

### **Proposed Topics for Master Theses**

1.The fish salting technology improvement using the injection method at fish processing plant “Pleiades” Kyiv region.

2. The biological technology application for conservation of moist fish feed at Kerch fish processing plant AR Crimea.

3. Improving technology of hydrolyzed fish and plant feed mixtures under electrochemical hydrolysis application at Kerch fish processing plant AR Crimea.

4. Technology of dried sea fish species using aeroions at “Pleiades fish processing plant”, Kyiv region.

5. Technology of minced structured products using picowave treatment at Divial-2000 LTD, t. Kyiv.

6. Improvement of technology for children food from seaweed at “Odessa Baby Food Cannery”, t. Odessa.

7. Improving technology preserves of aquatic invertebrates with pre heat treatment of raw materials at “Olvana LTD”, Kyiv region.

8. Improvement of technology of canned fish for baby food at “Odessa Baby Food Cannery”, t. Odessa.

9. Improving seafood technologies from freshwater fish at “Divial-2000 LTD”, t. Kyiv

10. Liquid emulsified products based on raw fish technology improvement at “Factory of cooking”, t. Kyiv.

### **Academic rights of applicants for a master program**

In addition to the specialty “Technologies of Preservation and Processing of Water Bioresources” entrants with a bachelor degree level diploma in the field of “Food

---

MASTER DEGREE PROGRAMS

Technology and Engineering" can continue education under the spesilty **at knowledge field "Food industry and agricultural production processing"**

- 8.05170104 "Technologies of Preservation, Conservation and Processing of Meat" (see p. 163);

under the spesilty **at knowledge field 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
- 8.18010021 – "Pedagogy of Higher School"(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – "Educational Institution Management" (see p. 427).

**Curriculum for specialist training of the educational and qualification level "Master" in specialty "Technologies of Preservation and Processing of Water Bioresources"**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				National	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	54	1,0	1,5
2	Philosophy of science and innovation development of nature and society	1	54	1,0	1,5
<i>Total number</i>			108	2,0	3,0
<i>1.2. Cycle of natural science (the fundamental) training *</i>					
1	Modern research methods in industrial branch	2	144	2,7	4,0
2	Labor protection in industrial branch	1	252	4,7	7,0
<i>Total number</i>			396	7,4	11,0
<i>1.3. Cycle of professional and practical training *</i>					
1	Actual problems of the industrial branch	1	360	6,7	10,0
2	Modern technologies of fish storage and conservation	2	360	6,7	10,0
3	Protein products technology from fish and seafood	3	180	3,3	5,0
<i>Total number</i>			900	16,7	25,0
<i>Total according to regulatory part</i>			1404	26,1	39,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of professional and practical training *</i>					
1	Technological equipment operation	2	144	2,7	4,0
2	Technological calculations, accounting and reporting	2	144	2,7	4,0
3	Electric power supply in the industry	3	180	3,3	5,0
4	Technological processes optimization	2	144	2,7	4,0
5	Biologically active substances from fish and seafood	3	144	2,7	4,0
<i>Total number</i>			756	14,1	21,0
<i>2.1.2. Cycle of humanitarian and socio-economic training*</i>					
1	Strategy for stable development of nature and society	1	36	0,7	1,0
2	Agrarian and environmental law	1	36	0,7	1,0
3	World agriculture and food resources	1	36	0,7	1,0
4	International standardization and certification of technology, raw materials and finished products	1	36	0,7	1,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				National	ECTS
<i>Total number</i>			144	2,8	4,0
2.2. Disciplines chosen by student					
2.2.1. Cycle of professional and practical training*					
Production oriented specialization					
Master Program "Technologies of aquatic biological resources storage and processing"					
1	Fish meal processing	3	216	4,0	6,0
2	Heat supply industry enterprises	3	216	4,0	6,0
<i>Total selected by the students</i>			432	8,0	12,0
Master Program "Biochemical research methods"					
1	Special biochemistry	3	162	3,0	4,5
2	Modern methods and instruments of biochemical research	3	162	3,0	4,5
3	Laboratory activities quality management	3	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
Total number of elected part			1332	24,7	37,0
Practical training			360	6,7	10,0
Writing and defense of master's thesis			144	2,7	4,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### *1.1. Cycle of humanitarian, social and economic training\**

**Business foreign language.** In connection with Ukraine's integration into European society, the spread of networking and contacts in the field of public administration, foreign language increases the effectiveness of mutual partnership contributes to understanding the parties and strengthens the relationship between the different countries. Discipline is intended to form the skills and knowledge in English language in the daily communication between various countries representatives on different professional topics, to teach students for informational written exchange, to take part in projects and discussions, participation in international conferences.

**Philosophy of science and innovation development of nature and society.** In the course highlights the specificity of philosophy of science and innovation development as a special type of human knowledge, presents the major trends in characteristics of the historical development and methodology of philosophy science main problems solution. The methodological, structural, ideological - value principles and characteristics of scientific knowledge, modern philosophical analysis the global and domestic science, the prospects for their development and interaction with other spheres of social life are studied.

#### *1.2. Cycle of natural science ( fundamental) training\**

**Modern research methods in industrial branch.** The program includes the study research methodology basic principles in the food industry, the modern classification of experiments, methods of selection, systematization, scientific information and research results analysis, the order of research work and intellectual property rights registration

**Labor protection in industrial branch.** Health maintaining and promoting methods for, diseases preventing and professional capacity providing. Principles of selection exercises their arrangement and sequence of intended use. Healthy lifestyle. Methods and tools for the professional development of significant mental and physical qualities.

Methods of psychophysical training. Rules to prevent physical fatigue, overtraining, overexertion, and other manifestations of the crisis. Methods of self monitoring of health, physical development and operation of functional systems.

*1.3. Cycle of professional and practical training\**

**Actual problems of the industrial branch.** Study program provides study on the current state and prospects of the raw materials of Ukraine in freshwater ponds and oceans, characteristics of the main indicators of quality of fish raw materials, products and methods of definition, description of the main techniques and methods to preserve the quality of live, chilled, frozen, salted fish; smoked, dried, and other methods of preserving fish and aquatic organisms, fish preparations and culinary products and more.

**Modern technologies of fish storage and conservation.** Study program provides on the current state and perspectives of storage technologies and preserving of fish and seafood; characteristic principles of conservation: bioz, suspended animation, abioz, conservation methods, description of the main techniques and methods to preserve the quality of live fish, way chilling fish and seafood; characterization modern methods of freezing fish and seafood, frozen food products and semi-finished products, sterilization, pasteurization of fish products.

**Protein products technology from fish and seafood.** Program provides theoretical and practical study of modern technologies of protein masses, stuffing, concentrates, hydrolysates, molded, structured, and multicomponent emulsion products controlled composition and structure, choice of the best options for specific natural and economic conditions to promote the range, increase output and increase the efficiency of use of raw materials.

## 2. ELECTIVE ACADEMIC DISCIPLINES

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of professional and practical training\**

**Technological equipment operation.** The educational program includes the study of theoretical and practical issues related to the operation of typical special processing equipment which is used in meat production it's repair and installation.

**Technological calculations, accounting and reporting.** During the discipline study future professionals are expected to prepare for independent effective professional activity, perform calculations of basic raw materials, auxiliary materials and finished products, the main production equipment using computer technology, to use knowledge in terms of implementation and optimization of production processes, make rational technological solutions, analyze the production situation.

**Electric power supply in the industry.** The educational program includes the study of electrical machines, transformers, lighting, power supply of the food industry, saving electricity.

**Technological processes optimization.** The educational program includes the study of theoretical and practical issues typical technology optimization, aimed at identifying the best conditions under the chosen process quality criterions. During study of discipline future professionals are planned to provide for knowledges about food production processes optimization models. And also find out the most important methods of optimization and with their help to learn modeling of processes stage, production sites hardware design. Based on estimated parameters of process or devices design it is possible to select those of them which can use to maximize technological effect in the planned production volume.

**Biologically active substances from fish and seafood.** Curriculum includes the study of properties of biologically active substances in the various aquatic organisms,

theoretical principles and technology of biologically active substances in fish and seafood and general methods for their control.

*2.1.2. Cycle of humanitarian, social and economic training\**

**Strategy for stable development of nature and society.** Discipline provides formation of knowledge about optimization and harmonization of relations between humans and the environment, creating theoretically reasonable steps to stabilize and improve the environmental situation in the contemporary socio - economic conditions. Any – human activity affect the environment, and biosphere deterioration is dangerous to all living, including humans. All these put forward the problem of our planet biosphere preservation. A comprehensive study of existing problems of man's relationship with the environment should provide a strategic approach to address both immediate and prospective planetary mankind problems.

**Agrarian and environmental law.** Involves the study of peculiarities of the agricultural legislation in the modern period. Particular attention is paid to the study of the legal regulation of land reform and property relations in the countryside. We study the basic directions of state support for agricultural producers, namely the system of tax incentives, loans and insurance. The ways of investment in the agricultural sector of the country as a means of removing it from the crisis.

**World agriculture and food resources.** Students training on orientation in actual problems of the global food system, make informed decisions to improve the competitiveness of domestic agricultural enterprises in domestic and foreign markets.

**International standardization and certification of technology, raw materials and finished products.** At the present stage of society and its productive forces development, standardization is becoming as an important means to improve production efficiency and product quality. Under modern conditions products, production manufacturing standardization and certification quality management systems in the food industry is increasing. This necessity is related to the increasing demand for its products in Ukraine and abroad. The discipline learning provides meeting consumers requirements on product quality and safety with continued growth regard production value and of trade turnover between countries. All it requires mastering methods to increase competitiveness, new, innovative products creation stimulate.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training\**

*Production oriented master program*

**Master Program “Technologies of aquatic biological resources storage and processing”**

**Fish meal processing.** Discipline involves the study of methods and techniques of manufacture, storage, use and evaluation of quality feed products from aquatic, study the current state of fodder production in the global and domestic fishing industry, fish meal production methods, its energy and biological value, and changes that occur during the production and storage.

**Industry enterprises heat supply.** Program provides the study of theoretical foundations of thermodynamics, heat and mass transfer theory, rational use of thermal energy and environment protection.

**Master Program “Biochemical research methods”**

**Special biochemistry.** Is a basic discipline within improving knowledge of biochemical processes occurring in living organisms, the poisoning chemicals pathological changes and processing and livestock production preservation. In-depth knowledge of

## MASTER DEGREE PROGRAMS

biochemistry play a special role in the professional formation of and facilitate better learning of sciences master's program.

**Modern methods and instruments of biochemical research.** Studying modern electrochemical, spectrometric and chromatographic techniques and instrumentation laboratory tests used to monitor the quality and safety of food and agricultural products and environmental objects. It provides basic knowledge for laboratory professionals.

**Laboratory activities quality management.** Examines national and international standards for the organization of chemical analytical laboratories, evaluation of the suitability techniques, traceability and uncertainty of the results. Received knowledge will allow to work professionals in the laboratory and safely perform analytical measurement techniques.

---



**Master Training  
in specialty “QUALITY, STANDARDIZATION AND CERTIFICATION”  
Branch of knowledge “Specific categories”**

**Form of training, licensed number of students:**

- full-time study	30
- by correspondence	30
<b>Term of study</b>	<b>1,5 years</b>
<b>Credits</b>	<b>90 ESTS</b>
<b>Language of training</b>	<b>Ukrainian</b>
<b>Qualification of graduates</b>	<b>master's degree in quality, standardization and certification</b>

**The training concept**

The peculiarity of training specialists of quality, standardization and certification is that this program is open for various areas of training graduates.

Its peculiarity is the openness, multivectority, flexibility and multi-varianity.

However, there are significant differences in the list elective disciplines of the curriculum for bachelors who have degree in economy from the list of disciplines in programs for bachelors in technology, engineering or biological basic education.

The main tasks are to impart students' knowledge in:

- main components of the technical regulation, the basic legislative acts of Ukraine in technical regulation sphere;
- main tasks, principles, research and practical approaches in the field of standardization, certification, metrology, quality, technical regulations impact on the efficiency of the economy;
- basic regulatory documents on standardization, certification, metrology, quality management of international and European experience, legislative regulatory framework in the field of technical regulations.

**Production oriented master program**

***Master program “Food of safety and quality management”***

Master Program mission is the European level specialists training in the field of standardization, certification and quality with aim to ensure competitive on the world market production and services.

The program aims at training professionals with basic knowledge in the field of food safety and quality, including the following items:

legal and regulatory issues to ensure the food quality safety in Ukraine, EU and international practice; food safety system management; food system quality management, food quality and safety monitoring.

**Sphere of graduates employment**

Master in “Quality, standardization and certification” allows graduates to take up a wide range of positions: quality expert, quality engineer, quality management department officer validation department, technical control department, metrological service expert standardization and certification expert, internal auditor and others.

This education is also necessary for professionals involved in new products standardization, products and services certification, technical documentation improving, internal audits and self inspections, validation processes, personnel equipment and facilities certification.

***Master program “Product’s quality, standardization and certification at poultry enterprises”***

The program is aimed at in-depth issues study related to the product’s quality, standardization and certification at poultry industry enterprises including: legal and regulatory issues poultry cultivation standardization obtaining and processing poultry farming products; poultry farming products quality and safety management; required indicators modern control methods performance; conformity assessment procedures; environmental risk management in poultry.

**Sphere of graduates employment**

Master in “Quality, standardization and certification” can work at local authorities and research structures consumed State Standard of Ukraine, departments and services of standardization, metrology and certification for enterprises and organizations of many industrial branches.

***Master Programme “Environmental standardization and certification”***

The program aims at students training in development, implementation and environmental management systems improvement in accordance with international environmental standards, environmental labeling and declaration, environmental risk management during economic activity, use of genetically - modified organisms with international and European standards.

**Sphere of graduates employment**

The program training specialists in quality, standardization and certification meets the staffing needs environmental protection state departments in regions, districts, Kyiv and Sevastopol;

***Master program “Forestry companies and organizations quality, standardization and certification management”***

The program aims to master’s training in organizational issues of forestry sector raw materials quality, processes and products requirements adaptation to the international and European legal and regulatory documents.

The program covers the certification issues in forestry sector, adapting national certification procedures for international.

**Sphere of graduates employment**

Masters in “Forestry companies and organizations quality, standardization and certification management” can work at local authorities and research structures, State Standard of Ukraine, departments and services of standardization, metrology and certification for forestry organizations and enterpraisis.

**Practical training**

Student’s practical training for the EQL “Master” in specialty 8.18010010 “Quality, standardization and certification” is performed in two stages - an introductory practical training, which takes place directly after students admission and pre-diploma practical training. During the practical training practical activities, practical skills, abilities’ and competencies of the future specialist in standardization, certification and quality management are founded.

At the Master’s educational period at the University, they are passing two industrial practical training courses. All this practical courses different from each other by purpose, content and duration.

---

The main practice training bases are in specialty 8.18010010 "Quality, standardization and certification" are: State corporation "Ukrainian research and training center standardization and certification problems", "Mironivsky meat processing plant Legko", "Ukrain Quality Association", Veritas bureau LTD, "TUFF Ray Land Ukraine", Ukrainian Institute of Agricultural Radiology, Ukrainian Research Institute of forecasting and testing techniques and technologies in agricultural branch, named after Leonid Pogorelovo, State Certification and Examination agricultural center t. Kyiv, J-SC "Zhashkiv Creamery" Cherkasy region, SE "Malyn forestry" Zhytomyr region, "Starynska Poultry LTD", SD NULES Ukraine TRE "Velykosnitynske named after A. Muzychenko", "Belaya Tserkov processing plant" Kyiv region, "Galakton LTD" Kyiv region, Bread complex № 10 t. Kyiv, "Obolon LTD", t. Kyiv, "Dewdrop LTD", t. Kyiv; "Olkom LTD", t. Kyiv, J-SC "Kozyatinsky meat", Vinnitsa region, "Gaysinsky meat LTD" Vinnitsa region and others.

### **Proposed Topics for Master Theses**

1. The development of interlaboratory comparisons program of testing soil for compliance with ISO / IEC Guide 43-1:1997 on PRAT "MHP".
2. The development of environmental production aspects management program at the processing enterprises O J-SC "Farmak".
3. Implementation of statistical process control system at agricultural machinery testing laboratory
4. Research of consumer demands on wood quality for furniture production.
5. The development of proposals to improve the system of monitoring the production of condensed milk at "Bershad-Milk" LTD.
6. The development of technology for growing gladioli standard and justification of standardized indicators at the GP "UkrNDNC".
7. Development of models of optimal feeding rations of cattle.
8. Development of technology for growing ostriches standard and justification of standardized indicators.
9. Development of elements of safety and quality control system for berries, grown in private households.
10. Evaluation of EU requirements for validation methods for testing food and development of recommendations for implementation in practice of ULYABP agriculture.

### **Academic rights of applicants for a master program**

The peculiarity of quality, standardization and certification specialists training is that this program can be entered by graduates of various areas of training with bachelor or specialist degree. In addition to the specialty "Quality, standardization and certification" with a bachelor degree level diploma can continue education under the specialty **at knowledge field 1801 "Specific categories"**:

- 8.18010021 – "Pedagogy of Higher School"(see p. 434);
  - 8.18010018 – Administrative management (see p. 397);
  - 8.18010020 – "Educational Institution Management" (see p. 427).
-

**MASTER DEGREE PROGRAMS**

**Curriculum for specialist training of the educational and qualification level  
“Master” in specialty “Quality, standardization and certification”**

№	Training Discipline, Practice	Semester	Volume		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Humanitarian, social and economic training cycle*</i>					
1	Philosophy of science and innovative development	1	54	1	1,5
2	Labor protection	3	90	1,7	2,5
3	Economic aspects of business	3	126	2,3	3,5
4	Business foreign language	1	54	1	1,5
<i>Total number</i>			324	6,0	9,0
<i>1.2. Cycle of natural science ( fundamental) training*</i>					
1	Research and innovative processes	2	126	2,3	3,5
2	Systems approach and decision-making methods basis	3	162	3,0	4,5
3	International and regional standardization and certification	3	36	0,7	1,0
<i>Total number</i>			324	6,0	9,0
<i>1.3. Cycle of professional and practical training*</i>					
1	Quality control	1	198	3,7	5,5
2	Standartization	1	162	3,0	4,5
3	Audit and certification	1	162	3,0	4,5
4	Quality, safety and health of agricultural products	2	180	3,3	5,0
5	Monitoring and methods of improvement of agricultural products	1	126	2,3	3,5
6	Quality Management of Agricultural products and production	2	180	3,3	5,0
7	Standardization and certification of agricultural products	2	198	3,7	5,5
8	Environmental Management	2	126	2,3	3,5
9	Human resource management	2	126	2,3	3,5
10	Mathematical modeling	3	72	1,3	2,0
<i>Total number</i>			1530	28,3	42,5
<b>Total by the statutory element</b>			<b>2178</b>	<b>40,3</b>	<b>60,5</b>
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of humanitarian social and economic training*</i>					
1	World agriculture and food resources	1	36	0,7	1,0
2	Management decisions legislation	2	126	2,3	3,5
3	Psychology of management	1	126	2,3	3,5
4	Information Technology	3	126	2,3	3,5
<i>Total on university selection</i>			414	7,6	11,5
<b>2.2. Disciplines chosen by students</b>					
<i>2.2.1. Cycle of professional and practical training*</i>					
Production specialty					
Master program “Management of safety and quality of food”					
1	Veterinary Sanitation and processing of animal products hygiene	3	108	2,0	3,0
2	Sanitary microbiology	3	108	2,0	3,0
<i>Total selected by students</i>			216	4,0	6,0
Master program “Environmental standardization and certification”					
1	Environmental standards and certification	3	216	4,0	6,0
<i>Total selected by students</i>			216	4,0	6,0
Master’s degree program “Quality of products, standardization and certification at the poultry enterprises”					
1	Meat of agricultural poultry production	3	108	2,0	3,0
2	Management and marketing of poultry	3	108	2,0	3,0
<i>Total selected by students</i>			216	4,0	6,0

**MASTER DEGREE PROGRAMS**

№	Training Discipline, Practice	Semester	Volume		
			hours	credits	
				national	ECTS
Master's degree program "Management of quality, standardization at forestry companies and organizations"					
1	Foreign-economic activity in the forestry sector	3	216	4,0	6,0
<i>Total selected by students</i>			216	4,0	6,0
Total number of elected part			630	11,7	17,5
Practical training			360	6,7	10,0
Writing and defense of master's thesis			72	1,3	2,0
Total for specialty			3240	60	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## **Annotations of disciplines in the curriculum**

### **1. REGULATORY ACADEMIC DISCIPLINES**

#### *1.1. Cycle of humanitarian, social and economic training*

**Philosophy of science and innovation development of nature and society.** The course highlights the specificity of philosophy of science and innovation development as a special type of human knowledge, presents the major trends in characteristics of the historical development and methodology of philosophy science main problems solution.

The methodological, structural, ideological – value principles and characteristics of scientific knowledge, modern philosophical analysis the global and domestic science, the prospects for their development and interaction with other spheres of social life are studied

**Labor protection.** Health maintaining and promoting methods for disease preventing and professional capacity providing. Principles for selection of exercises, their arrangement and sequence. Healthy lifestyle. Methods and tools for the professional development of significant mental and physical qualities. Methods of psychophysical training. Rules to prevent physical fatigue, overtraining, overexertion, and other manifestations of the crisis. Methods of self-health control, physical and operation of functional systems development.

**Economic aspects of business.** Curriculum subjects include the study of theoretical concepts, as well as acquiring and mastering of practical skills in the ability to find specific ways and means of making specific management decisions, economic calculations, analysis and research and identification of internal reserves of industrial and business enterprises.

During training the discipline provides future specialists with the current planning and development management of company basic knowledge, decision making, monitoring decisions implementation, identifying reserves to increase production efficiency, performance evaluation as the enterprise as a whole and its individual departments and employees.

**Business foreign language.** In connection with Ukraine's integration into European society, the spread of networking and contacts in the field of public administration, foreign language increases the effectiveness of mutual partnership contributes to understanding the parties and strengthens the relationship between the different countries. Discipline is intended to form the skills and knowledge in English language in the daily communication between various countries representatives on different professional topics, to teach students for informational written exchange, to take part in projects and discussions, participation in international conferences.

#### *1.2. Cycle of natural science (fundamental) training\**

**Research and innovative processes.** Methods of scientific research. Methods of study of forming quality products (services). Type and capacity of material resources (equipment, resources) to determine the conditions of formation of quality products

(services). Methods for determining the usefulness of material resources (equipment, resources) to determine the conditions of formation of quality products (services). Forming quality of goods (services) data streams. Collection and processing of data streams. Analysis and systematization of information. Modeling processes. Cause-effect relationships in the areas of quality, standardization and certification. Prediction of production system. Analysis of the production system. Analysis of motivation. The methods of scientific research. Collection and processing of data streams. Analysis and systematization of information.

**Systems approach and methods of decision-making basics.** Mastering program provides skills to identify systemic patterns highlighting milestones solution, identify technology of system management, which is a reasonable goal based on performance and resource utilization, usage of the most known methods of decision making. Study of the principles of a systematic approach, technologies of standard management methods, multicriteria method algorithm scales.

**International and Regional Standardization and Certification.** Program provides study of the principles of international standardization, accreditation and conformity assessment requirements of the major European and international legislative, regulatory documents on standardization, certification and accreditation, environmental protection in agriculture, quality assurance and safety food and activities of international and regional organizations for standardization, accreditation and conformity assessment.

### 1.3. *Cycle of professional and practical training\**

**Quality control.** Quality control System of products and/or services. The structure of the organization (company, institution). Standards of quality management system of ISO 9000. Special features of quality management of products and/or services. Creating, implementing and managing quality systems. Documentation of quality control of products and/or services. Technical documentation. The plan works on quality control and or services. Identification of the needs and demands of consumers for products and/or services. The process of quality control at the stage of marketing. Evaluation of the quality of products and/or services. Determination of the capacity of the organization (companies, institutions) quality products and/or services required. Warning of the results of internal audits of quality management system. Measurement, analysis and improvement of the quality management system. Adjustment of action for non-conformities identified as a result of internal and external audits of quality management system.

**Standardization.** Standards of organizations (businesses, institutions). Checking for compliance with the achieved level of development of science and technology in the relevant area of the standard. Determination of the achieved level of development of science and technology in the relevant area of the standard. Procedure for amending the regulations. Technical regulations. Legislation in the field of standardization. Order cancellation regulations. Information about changes in the regulations. Unification of products and/or services. Standardization of products and/or services. The state system of standardization. Control of norms of organizations (companies, institutions) technical documentation. Methods of providing service organizations (enterprises, institutions) with the necessary documentation standardization, quality control and certification. Reports on the implementation of standards and operation of all service organizations (enterprises, institutions) for quality control and certification.

**Audit and certification.** Order of the application form for certification of products and/or services and/or quality systems. Objects certification. Certification schemes. Rules of certification schemes. Rules of choice of certification schemes. Scheme of testing products and/or services and/or quality systems. Certificates of conformity. The national system of certification and accreditation of foreign countries. Self-assessment and internal audits of quality systems. Internal audits of the quality. Certificates in UkrSEPRO.

**Quality, safety and health of agricultural.** Program courses include study of basic methods of determining the quality and safety of agricultural products, the factors that determine the quality of agricultural products, and related regulatory and legislative base.

**Monitoring and methods of improvement of agricultural production.** Program courses include the study of various systemic and methodological approaches of monitoring methods related to the quality and safety of food products and raw materials of animal and vegetable origin, processes that occur in these products and ways to improve product quality and production in general.

**Quality Management of Agricultural products and production.** Program provides study of the Laws of Ukraine and regulations concerning the quality and safety of agricultural products and materials, the study of the maximum allowable levels of safety performance by national, European and international regulations for different types of agricultural product, standards EN ISO 14000 on environmental protection in relation to processing and agricultural enterprises.

Mastery of practical skills of development of quality management systems and food safety and agricultural products at all stages of production according to ISO 180 9000 and based on the principles of HACCP.

**Standardization and certification of agricultural production.** Program provides study of principles of international and national standardization for agricultural products, the requirements of major international, European and national legislation, regulations and regulatory documents on standardization, certification of agricultural products quality and safety performance safety and quality of agricultural products, review the practice of creating regulations.

**Environmental Management.** Environmental management according to EN ISO 14000. Documentation of environmental management according to EN ISO 14000. Methods and techniques of quantitative assessment of the environmental and social consequences of accidents and incidents. Emergencies. Documents for the prevention of injury or level of damage of resources (human, material, information, etc.) in case of an emergency. Regulation on investigation and registration of accidents, occupational diseases and accidents at enterprises, institutions and organizations. Direct and indirect assessment of damage to people and the environment. Simulation of scenarios of emergencies. Direct causes of events, incidents. Systems of centralized and local public notification. The order of information in the field of population and territory. The main measures of protection of population and territories in emergency situations. Personal protection equipment. Criteria and basic principles of evacuation measures. Evacuation organs, their functions and tasks.

**Human resource management.** A system of measurable indicators of employees skills. General principles of the social division of labor in Ukraine. The system of legal regulations of work: social division of labor. Positioning of specialist in the social division of labor. Corporate culture of organizations (companies, institutions). Socio-economic situation of society and forecast of its development. Simulation of profession (professional model). Modeling social activities (individual model). Classification of structural elements of professional activity.

**Mathematical modeling.** Discipline is the course containing knowledge that enables students to understand the use of the simulation results for the selection of parameters of technological processes and possible methods of calculating the equipment in the technology industry, and critical approach to the selection of the process of food production. The study of this discipline gives future professionals the ability of scientific and technical analysis and process control in order to produce high quality products, based on the position of system analysis.

---

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of humanitarian social and economic training\*

**World agriculture and food resources.** Training students on the orientation of the current global food system problems, making informed decisions to improve the competitiveness of domestic agricultural enterprises at domestic and foreign markets.

**Management decisions legislation.** The study of the legal regulation of certain types of undertakings and their legal environment, contractual relations and regulation of management decisions.

**Psychology of management.** Theoretical and practical training of students on a deeper knowledge of the conditions and driving forces factors and determinants of personality development is the subject of management, specific of leader motivational, microsocium adaptive processes, types of leaders, leadership styles.

**Information technology.** Theoretical and practical training of students on the use of information research complex in the systems of quality, standardization and certification, to provide access to modern information resources, providing effective tools and methods for creating, storing, processing and transmitting information.

### 2.2. Disciplines chosen by the student

#### 2.2.1. Cycle of professional and practical training\*

##### *Production oriented master program*

#### **Master program “Management of safety and quality of food”**

**Veterinary Sanitation and Hygiene of animal products processing.** Discipline program provides study of the basic principles of health expertise of food raw materials and food, the risk of chemical contamination of the nature and principles of their regulation in animal products, the risk of contamination of biological nature, sanitary-hygienic examination of meat and meat products, fish and fish products, milk and dairy products.

**Sanitary microbiology.** Program provides study of biological properties of microorganisms that cause environmental pollution, food spoilage, methods of microbiological and virological studies of objects of the environment (soil, water, air), as well as ways and methods for evaluating the degree of infection of animals and human environment with pathogenic bacteria and viruses, normal microflora interchange between animals, human, environmental, industrial and domestic processes that disrupt the natural self-purification and disinfection of the environment.

#### **Master program “Environmental standardization and certification”**

**Environmental standards and certification.** Discipline program provides study of regulations on environmental protection in practice. Certification in this case involves mastering the conformity assessment procedures of products, businesses, activities, accommodation and some areas with standards and regulations in environmental management and environmental protection. Environmental certification is an important part of environmental assessment and environmental audit. Environmental certification became of an particular relevance in connection with the accession of Ukraine to the World Trade Organization (WTO), which requires environmental compliance not only of production quality, but also of the industry activity.

#### **Master program “Quality of products, standardization and certification in the of poultry enterprises”**

**Production of poultry meat.** The subject of discipline is the study of systems and methods for maintenance of adult birds and rearing of poultry for meat production in farms of different types using the experience of domestic and foreign science.

---



**Management and marketing of poultry.** The main goal of discipline is to form modern management thinking, basics of system management organizations of all kinds - making appropriate management decisions for the future workplace. Forming student's knowledge of the theoretical basics and practical skills of management and poultry marketing.

**Master program "Management of Quality, standardization and certification of forestry companies and organizations"**

**Foreign-economic activity in the forestry sector.** The subject of the course is a combination of commercial, economic, legal, financial relations in the sphere of economic activity between the subjects of foreign trade and foreign entities on the territory of Ukraine and abroad.



## TECHNICAL EDUCATION AND RESEARCH INSTITUTE

Director – Dr. Sc., Professor Valeriy Dubrovin  
Tel.: (044) 527-85-62  
E-mail: vv\_tech@ukr.net  
Location: 11, educational building, 334, rooms

## FACULTY – CONSTRUCTION AND DESIGN OF MACHINES

Dean – Ph.D.(Technical Sciences), Oleg Marus  
Tel.: +38 (044) 527-81-29  
E-mail: Marus\_O@ukr.net  
Location: building № 11, room 305

The faculty provides teaching of Master-students on courses:

### **8.05050303 “Forest Complex Equipment”**

Diploma Departments:

Designing of Tractors, Machines for Agriculture and Forestry

Tel.: +38 (044) 527-88-95

E-mail: KovbasaV@ukr.net

Head of department – Doctor of Technical Sciences, professor Volodymyr Kovbasa

### **8.05050312 “Machinery and Agricultural Equipment”**

Diploma Departments:

Constructing of Machines

Tel.: +38 (044) 527-87-34,

E-mail: machinebuild\_centre@twin.nauu.kiev.ua

Head of department – Doctor of Technical Sciences, professor Vyacheslav Loveykin

## FACULTY OF ENGINEERING AGROBIOSYSTEM

Dean - Ph.D., Ivan Rogovskii

Tel.: (044) 527-85-34

E-mail: mechan\_dean@twin.nauu.kiev.ua

Location: 11, educational building, 309, rooms

Faculty organizes education of Masters in specialities:

**8.07010102 – “Organization of transportation and Management in Transport (Road Transport) “**

**8.07010104 - “Traffic Organization and Control”**

Graduating department: Transport Technologies and Equipment in Agrpindustrial Complex

Tel.: (044) 527-89-78

E-mail: transport\_chair@twin.nauu.kiev.ua

Head - Dr. Sc., Professor Volodimir Ivanyshyn

**8.10010203 “Mechanization of Agriculture”**

Graduating departments:

Mechanization of Animal and Systems Biotechnology

Tel.: (044) 527-85-35

---

MASTER DEGREE PROGRAMS

**E-mail: [mechaniz\\_chair@twin.nauu.kiev.ua](mailto:mechaniz_chair@twin.nauu.kiev.ua)**

**Head - Dr. Sc., Professor Gennady Golub**

**Reliability of Machinery**

**Tel.: (044) 527-87-71**

**E-mail: [reliability\\_chair@twin.nauu.kiev.ua](mailto:reliability_chair@twin.nauu.kiev.ua)**

**Head - Dr. Sc., Professor Anatoliy Boyko**

**Technical Service and management of engineering by M.P. Momotenko**

**Tel.: (044) 527-88-53**

**E-mail: [techserv\\_chair@twin.nauu.kiev.ua](mailto:techserv_chair@twin.nauu.kiev.ua)**

**Head - Dr. Sc., Valery Voytyuk**

**Occupational Safety and Environmental Engineering**

**Tel.: (044) 527-85-62**

**E-mail: [vv\\_tech@ukr.net](mailto:vv_tech@ukr.net)**

**Head - Dr. Sc., Professor Valeriy Dubrovin**

---

**Master Training**  
**in specialty “FOREST COMPLEX EQUIPMENT”**  
**Branch of knowledge “Mechanical engineering and processing of materials”**

**Form of training, licensed number of students:**

– full-time	50
Term of study	1,5 years
Credits	90 ECTS
Language of teaching	Ukrainian
Qualification of graduates	M.Sc. Mechanical engineering

**The concept of training**

Training of Master-students within the program “Machinery for forest complex” is based on a systematic approach to obtain specific skills and knowledge that are sufficient for realization of professional tasks and responsibilities in the area of machine constructing, designing, testing, certification, maintenance and utilization of machines and equipment for forestry.

**Production oriented master program**

***Master program “Constructing machines, designing and testing of techniques for forest complex”***

A specialist obtains a deep knowledge of design, engineering and testing of machines for forest complex, based on the theory of technical systems, comprehension of system evaluation methods and methods of equipment testing for the forest complex by industrial, national and international standards.

It is assumed a clear comprehension to constructing machines for forestry as a part of the mechanical system. It is assessed as repairable and non-repairable systems and ensuring their reliability.

**Sphere of graduates employment**

Alumnus with diploma of Engineer-Mechanic are able to implement professional tasks and responsibilities provided in the form of engineering activity of positions in various groups of profession related to engineering, organization of production and management, teaching and researching in engineering departments of research institutions.

**Research oriented master program**

***Master program “Mechatronic Systems of Machines for forestry”***

The program provide a deep knowledge about innovative construction and designing of mechatronic systems in equipment for forestry, based on classical and modern concepts of mechatronics, mechanical motion control with programmable software support and digital control theory.

Researches and innovative development carried out on dynamic models of forestry equipment (the dynamics of a nonlinear function of the equipment provisions of links; dynamic loads to equipment during steady-state and unsteady modes of motion).

**Sphere of graduates employment**

Alumnus with diploma of Engineer-Mechanic are able to implement professional tasks and responsibilities provided in the form of engineering activity of positions in various

---

groups of profession related to engineering, organization of production and management, teaching and researching in engineering departments of research institutions.

### Practical training

During practical training the faculty is oriented on close co-operation and collaboration with educational-experimental enterprises of university, such as: Separated subdivision of NULES of Ukraine “Velykosnytynske Education and Research Farm named after O. Muzychenka”, Separated subdivision of NULES of Ukraine “Agronomic Research Station”, Separated subdivision of NULES of Ukraine “Education and Research Farm “Vorzel”, Separated subdivision of NULES of Ukraine “Boyarka Forestry Research Station”.

Practical training is also carried out at the advanced research institutions and enterprises of agricultural and forestry such as: National Scientific Centre “Institute of Mechanization and Electrification of Agriculture” L.Pogorelyi’s Ukrainian Research Institute of Forecasting and testing of equipment and technologies for agricultural production; Companies “TAN”, “John Deere”, “Amaco”, “Astra”; State Forestry Agencies of forest resources of Ukraine.

### Proposed Topics for Master Theses

1. Adjustment to construction parameters of the wood-materials cutter at the equipment line to produce solid bio-fuels.
2. Investigation to the drying process of wood raw-materials and adjustment of parameters of dryers at the equipment line to produce solid bio-fuels.
3. Adjustment to parameters of hydraulic mechanism for trimming wood.
4. Optimizing to rotation mode of crane for transporting of timber.
5. Adjustment to constructional and technological parameters of granulators.

### Academic rights of applicants for a master program

Additionally to the program “**Machinery of forest complex**” applicants, who have Bachelor degree of “Mechanical engineering”, can continue their education in the program “**Mechanical engineering and processing of materials**”:

- 8.05050312 “Machinery and equipment for agricultural production” (see p. 193) field of knowledge 1801 “Specific categories”:

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427).

### Curriculum for specialist training of the educational and qualification level “Master” in specialty “Forest Complex Equipment”

№	Name of educational discipline, practical training	Semester	Amount		
			hours	credits	
				national	ESTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian and socio-economic training*</i>					
1	Philosophy of science	1	54	1,0	1,5
2	Foreign language for business	1	54	1,0	1,5
<i>Sum per cycle</i>			<i>108</i>	<i>2,0</i>	<i>3,0</i>

**MASTER DEGREE PROGRAMS**

№	Name of educational discipline, practical training	Semester	Amount		
			hours	credits	
				national	ESTS
<i>1.2. Cycle of naturally (fundamental) training *</i>					
1	Automation of technical systems of machines for forestry	1	108	2,0	3,0
2	Applied computer technologies of machines for forestry	2	108	2,0	3,0
3	Measuring devices and methods of measurement	3	72	1,3	2,0
4	Reliability of machines for forestry	1	108	2,0	3,0
<i>Sum per cycle</i>			396	7,3	11,0
<i>1.3. Cycle of professional and practical training *</i>					
1	Computer design of equipment for forestry	1, 2	180	3,3	5,0
2	Theory and designing of machines for forestry	1	144	2,7	4,0
3	Mechatronic systems of machines for forestry	2	108	2,0	3,0
4	Theory of the technical systems	3	108	2,0	3,0
<i>Sum per cycle</i>			540	10,0	15,0
<i>Sum per normative disciplines</i>			1044	19,3	29,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle naturally scientific (fundamental) training *</i>					
1	Foreign language	1	54	1,0	1,5
2	Engineering to using of life resources	2	108	2,0	2,5
3	Patenting and copyrights	1	54	1,0	1,5
4	International standardization and certification to technologies, raw-materials, and end products	1	54	1,0	1,5
5	History of techniques	1	54	1,0	1,5
6	Reliability of technical systems for forestry machines	2	162	3,0	4,5
7	Optimizing of designs for woodworking equipment	2	108	2,0	3,0
Production oriented disciplines					
Master's program "Constructing machines, designing and testing of techniques for forest complex"					
1	Testing of machines for forestry	3	108	2,0	3,0
2	Theory and designing of vehicles for forestry	3	108	2,0	3,0
3	Dynamics of machines for forestry	3	72	1,3	2,0
4	Designing of machines for forestry	2	90	1,7	2,5
<i>Sum per disciplines of university choice</i>			972	18,0	27,0
Research oriented disciplines					
Master's program "Mechatronic Systems of Machines for forestry"					
1	Testing and certification of machines for forestry	3	108	2,0	3,0
2	Experimental methods of researchers to machines for forestry	3	108	2,0	3,0
3	Dynamics of technical systems	3	72	1,3	2,0
4	Optimization of technical systems for forestry	2	90	1,7	2,5
<i>Sum per disciplines of university choice</i>			972	18,0	27,0
<i>2.2. Disciplines chosen by students</i>					
<i>2.2.1. Cycle professional disciplines and practical training *</i>					
1	Theory of mechatronic systems of machines for forestry	3	108	2,0	3,0
2	Nanotechnology	2	108	2,0	3,0
Production oriented disciplines					
Master's program "Constructing machines, designing and testing of techniques for forest complex"					
1	Mechanics of materials and timbers	3	108	2,0	3,0
2	Methods of designing machines for forestry	3	108	2,0	3,0
3	Design of vibration machines for forestry	3	144	2,7	4,0
4	Designing of technical systems for forestry	3	108	2,0	3,0
<i>Sum per disciplines of a student's choice</i>			684	12,7	19,0
Research oriented disciplines					
Master program "Mechatronic Systems of Machines for forestry"					
1	Mathematical modeling of technical systems for forestry	3	108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№	Name of educational discipline, practical training	Semester	Amount		
			hours	credits	
				national	ESTS
2	Newest design methods of machines for forestry	3	108	2,0	3,0
3	Vibration processes in machines for forestry	3	144	2,7	4,0
4	Mechanics of contact interaction of machines with timber	3	108	2,0	3,0
<i>Sum per disciplines of a student's choice</i>			<i>684</i>	<i>12,7</i>	<i>19,0</i>
Sum per selective component			1656	30,7	46,0
Practical trainings			360	6,7	10,0
Preparing and defense Master's thesis			180	3,3	5,0
Sum per program			3240	60,0	90,0

\* Names cycles disciplines according to the requirements of industry standards for higher education, approved on 27.08.2010, EQC and OPP.

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of humanitarian and socio-economic training \**

**Philosophy of science.** Course of this discipline has the aim to provide to students the integral view to main problems of philosophy at the level of objectiveness, ideological freedom, up-to-date vision of engineering science. Synthesis of gained knowledge creates a methodological and humanitarian background to professional and humanities disciplines as component of Master's culture.

**Foreign language for business.** The study of this discipline develops the knowledge and skills that will provide the necessary communicative ability related to professional communication e.g. at scientific conferences specialty, researching, preparing of reports, business meetings and negotiations with foreigners.

##### *1.2. Cycle of naturally (fundamental) training \**

**Automation of technical systems of machines for forestry.** Course of this discipline prepares Masters to solve the issues of automation processing systems for fixed and mobile machinery of forestry complex stand at high scientific and technological level; to improve the effectiveness of usage of automatic and automated systems.

**Applied computer technologies of machines for forestry.** The study of this discipline can improve applied theoretical and practical professional skills of future engineers through the study of newest computerized technologies of various technological systems; learning its functional potential and methods of use; obtain the necessary techniques and practical skills to work with applied computer programs.

**Measuring devices and methods of measurement.** This discipline reveals the basis of theoretical knowledge about measurements, evaluation and processing of measured results; introduces the main principles of work and construction of the electronic measuring devices, equipment to display information, measuring informational systems; and describes the perspectives of development of measuring instruments.

**Reliability of machines for forestry.** This is a complex discipline that studies: patterns of changes in the technical state of machines and their details during functioning; methods and techniques to remove defects and damages; giving to the surface of details the required physical and mechanical characteristics; recovery technological processes for typical parts of equipment used for forestry and wood processing.

##### *1.3. Cycle of professional and practical training \**

**Computer design of equipment for forestry.** Discipline involves the raise of comprehensive theoretical and practical professional skills by familiarizing students with

CAD-programs of various classes, learning its functional possibilities and methods of use, adoption of techniques and skills that are necessary for designing of machines for forestry.

**Theory and designing of machines for forestry.** This discipline studies the methods and techniques of calculation and designing at all stages of projecting; schemes, structure, and functions of machines and equipment for forestry.

**Mechatronic systems of machines for forestry.** Course of this discipline provides principles of constructing and common functioning algorithm for mechatronic systems used in forestry; its calculations, design and characteristics put into practice.

**Theory of the technical systems.** It is aimed to study the main points of systematic consideration to the technical problems of machinery and equipment for forestry and to present design methods to solve this problems. Thus, any technical system is viewed as a process of interaction of its elements in time and space.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle naturally scientific (fundamental) training \*

**Foreign language.** The study of this discipline allows professionally learning a foreign language to understand, communicate, read and translate professional literature; to take a part in conversation with foreigners about professional objects.

**Engineering to using of life resources.** Educational direction of the course consists of studying to scientific and industrial bases to develop alternative types of energy, especially from the sun, wind, and renewable biomass. Constructions and technological parameters of equipment are calculated to receive energy from alternative sources; to analyze its power ability, ecological and economic characteristics of gas, liquid and solid bio-fuels.

**Patenting and copyrights.** This discipline allows to give to future specialists of agricultural and forestry engineering the necessary knowledge about systems to defence an intellectual property; practical ability to use methods of authorized protection of scientific technical achievements, properties and products.

**International standardization and certification to technologies, raw-materials, and end products.** A course of this discipline allows to students purchase the knowledge about basic principles and activity of international and regional establishments which related to standardization and certification; main documents of International and European legislation in these spheres.

**History of techniques.** Discipline reviews some question of evolution to machinery, technical decisions, errors of planning, external factors, etc. This will be useful to both creation of the new and improvement of the existed machines and equipment.

**Reliability of technical systems for forestry machines.** Discipline is complex it includes: concepts of technical systems and their classification; schemes of reliability to technical systems and their analysis; method to optimize the quantity of reserved elements of systems; theory of graphs; logically-imitative design to research the reliability of technical systems; methods to provide the reliability of technical systems and equipment for forest complex.

**Optimizing of designs for woodworking equipment.** Discipline studies methods of the rational planning, organization and providing researchers and construction products, organization and forecasting; optimization of technological processes and constructions of woodworking equipment.

### *Production oriented disciplines*

#### **Master program “Constructing machines, designing and testing of techniques for forest complex”**

**Testing of machines for forestry.** A course of this discipline is directed to study the engineering methods to tests the machines for forest complex. That allows obtaining



an objective judgment about structural, technological, and operating characteristics of machines; to define its accordance to the requirements of specifications, tasks, requirements, and valid standards to working processes.

**Theory and designing of vehicles for forestry.** This discipline studies existed theoretical methods to develop and plan the constructional and technological parameters of vehicles for forestry.

**Dynamics of machines for forestry.** Discipline is directed on studying the dynamic models of concrete machines and equipment for forest complex; its mathematical descriptions; calculation of dynamic loadings and recommendations and ways to reduce these loadings during work.

**Designing of machines for forestry.** A course is directed on studying of existed bases to project the workings organs of equipment for forest complex; describing the functional possibilities and schemes of its usage; obtaining the necessary techniques and practical skills to implement the methods of projecting to industrial setting of forestry engineering.

#### *Research oriented disciplines*

#### **Master program “Mechatronic Systems of Machines for forestry”**

**Testing and certification of machines for forestry.** Educational discipline represents the base of theoretical knowledge and practical skills to the questions of general concept to test and certificate the machinery for forest complex.

A course of this discipline is directed to study the engineering methods of testing and certificating of equipment for forest complex; which allows getting the objective estimation about structural, technological and operating characteristics of machine; to define their accordance to specification requirements and valid technological standards to workings processes.

**Experimental methods of researchers to machines for forestry.** It studies the methods of experimental researches, e.g. processes, operations, systems, methods to formalize processes, its modelling; analysis of results; methods to improve, forecasting and determination the efficiency of processes and systems for the equipment of forest complex.

**Dynamics of technical systems.** Discipline is directed to development of dynamic models to a certain technical systems of machines and equipment for forest complex, their mathematical description; calculation of dynamic loadings; and statements of initial requirements for the following calculations of technical systems which were based on durability, productivity and reliability.

**Optimization of technical systems for forestry.** Discipline studies the methods of optimization to constructions of the technical systems for forest complex; principles and bases of modelling to the guided technical systems for industrial and forestry production.

#### *2.2. Disciplines chosen by students*

##### *2.2.1. Cycle professional and practical training \**

**Theory of mechatronic systems of machines for forestry.** Discipline studies theoretical bases of construction to mechatronic systems; methods of their management; and the automatic facilities to realize the mechatronic systems at the equipment for forest complex.

**Nanotechnology.** This discipline studies the possibilities to produce devices and their components, that are necessary to create, treat and manipulate by atoms, molecules and nanoparticles; and it also studies technologies which are based on manipulation to separate atoms or molecule in order to construct the structures with the expected properties.

---

Production oriented disciplines

**Master program “Constructing machines, designing and testing of techniques for forest complex”**

**Mechanics of materials and timbers.** This discipline can help to learn the basic theoretical knowledge and practical skills about the interaction of working organs of machines and equipment for forestry. The aim is to change properties and break characteristics of materials and media, which is the base of the most processes.

**Methods of designing machines for forestry.** Course of this discipline is directed at the existing knowledge about design techniques of forestry equipment; to learn the functional possibilities to use them; to get the necessary techniques and practical skills to implement design methods for production purposes in machines for forestry.

**Design of vibration machines for forestry.** The discipline studies principles and methods of calculation and analytical description of vibration and motion at mechanical systems; general principles to design of machine with vibration; evaluation of their parameters, means to generate mechanical vibrations and pulses; and structural features of vibration machines for forestry.

**Designing of technical systems for forestry.** Courses in this discipline aims to explore the theoretical approaches and principles of optimization timber production and logging works; the basis to calculate the productivity and technological coordination of the work to the single machines and the whole production lines; the rational plan-schemes and methods to design and optimize the technological processes of the timber storage and sawmill enterprises.

*Research oriented disciplines*

**Master program “Mechatronic Systems of Machines for forestry”**

**Mathematical modelling of technical systems for forestry.** This is a complex discipline that studies: the methods and technical means to obtain, process, present and use the information about the objects, which interact with each other and the environment. This is needed in order to foresee the reaction of the object from controlled impacts; to analyze its sensitivity to various factors while keep the mathematical description of the physical object adequate to the real.

**Newest design methods of machines for forestry.** Discipline examines analytical and experimental methods to develop mathematical models for forest industry technological objects; methods of object formalization and algorithm of a process for the automation equipment functioning; methods of identification to the objects of technological process by their frequency, pulse and transient characteristics; statistical methods of identification; elements correlation and spectral analysis.

**Vibration processes in machines for forestry.** Discipline studies vibratory processes in equipment for forestry; basic approaches and principles of mathematical relationships and methods of both theoretical and practical researchers under development to the theory of vibration working machinery and equipment for forestry.

**Mechanics of contact interaction of machines with timber.** This course has the aim to obtain the basics of theoretical knowledge and practical skills about the interaction of working parts of machine or equipment with timber; directed to change the properties and breaking ability of media and materials.

---

**Master Training**  
**in specialty “MACHINES AND AGRICULTURAL EQUIPMENT”**  
**Branch of knowledge “Mechanical engineering and processing of materials”**

**Type of studying, accredited quantity:**

- full-time studying 50
- part-time studying 50

**Duration of studying:**

- full-time studying 1,5 years
- part-time studying 2 years

**Credits**

90 ECTS

**Language**

Ukrainian, English, German

**Academic degree**

Engineer-Designer

**The concept of training**

Training of Master's course students in the field "Machines and equipment for agricultural production " is based on a systematic approach to obtain specific skills and knowledge that are sufficient for realization of professional tasks and responsibilities in the field of constructing, designing, testing, certification, maintenance and utilization of machines and equipment for agricultural production.

**Production oriented master program**

***Master program “Constructing machines, designing and testing of agricultural machines”***

A specialist obtains a deep knowledge of design, engineering and testing of machines for agricultural production, based on the theory of technical systems, comprehension of system evaluation methods and methods of equipment testing for agricultural machinery by industrial, national and international standards. Engineering of agricultural machines is implemented through formation, structuring and solution to optimization problems of analysis and synthesis.

**Sphere of graduates employment**

Alumnus with diploma of Engineer-Mechanic are able to implement professional tasks and responsibilities provided in the form of engineering activity of positions in various groups of profession related to engineering, organization of production and management, teaching and researching in engineering departments of research institutions.

**Research oriented master program**

***Master program “Mechatronic Systems of Machines for Agricultural Production”***

A specialist obtains a deep knowledge about newest construction and designing of mechatronic systems in machines for agricultural production, based on classical and modern concepts of mechatronics, mechanical motion control with programmable software support and digital control theory.

It is assumed a clear understanding of the stages in construction of hydro-mechanical and electro-mechanical systems; the use of technical elements and aesthetics for industrial design to the modern production of agricultural machines.

**Sphere of graduates employment**

---

Alumnus with diploma of Engineer-Mechanic are able to implement professional tasks and responsibilities provided in the form of engineering activity of positions in various groups of profession related to engineering, organization of production and management, teaching and researching in engineering departments of research institutions.

### **Practical training**

During practical training the faculty is oriented on close co-operation and collaboration with educational-experimental enterprises of university, such as: Separated subdivision of NULES of Ukraine “Velykosnytynske Education and Research Farm named after O. Muzychenka”, Separated subdivision of NULES of Ukraine “Agronomic Research Station”, Separated subdivision of NULES of Ukraine “Education and Research Farm “Vorzel”, Separated subdivision of NULES of Ukraine “Boyarka Forestry Research Station”.

Practical training is also carried out at the advanced research institutions and enterprises of agricultural and forestry such as: National Scientific Centre “Institute of Mechanization and Electrification of Agriculture”, L.Pogorelyi’s Ukrainian Research Institute of Forecasting and testing of equipment and technologies for agricultural production; Companies “TAN”, “John Deere”, “Amaco”, “Astra”; State Forestry Agencies of forest resources of Ukraine.

### **Proposed Topics for Master Theses**

1. Adjustment to constructional and technological parameters of the biogas reactors of the rotary type.
2. Investigation to efficiency of nutrition for plants cultivated in greenhouses by the use of mediator adapter.
3. Adjustment to constructional and technological parameters of the belt conveyor to move vegetable seeds.
4. Improving of potato harvesting machine with designing of separating device.
5. Investigation to the process and the rationale structural parameters in order to improve machine for the fuel pellets produce.
6. Adjustment to parameters and operating modes for milking machine of pair-wise type at the maternity section for 25 animals.

### **Academic rights of applicants for a master program**

Additionally to the program “Machines and equipment for agricultural production” applicants, who have a bachelor degree of “Mechanical engineering”, can continue their education in the program “**Mechanical engineering and processing of materials**”:

- 05050303 “Forest complex Equipment” (see p. 186);

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”, (see p.176);
  - 8.18010021 – “Pedagogy of Higher School”(see p. 434);
  - 8.18010018 – Administrative management (see p. 397);
  - 8.18010020 – “Educational Institution Management” (see p. 427).
-

**MASTER DEGREE PROGRAMS**

**Curriculum for specialist training of the educational and qualification level  
“Master” in specialty “Machines and equipment of agricultural production”**

№	Name of educational discipline, practical training	Semester	Amount		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian and socio-economic training *</i>					
1	Philosophy of science	1	54	1,0	1,5
2	Business foreign language	1	54	1,0	1,5
<i>Sum per cycle</i>			108	2,0	3,0
<i>1.2. Cycle of natural (fundamental) training *</i>					
1	Automation of technical systems	1	126	2,3	3,5
2	Applied computer technologies	2	162	3,0	4,5
3	Measuring devices and methods of measurement	3	126	2,3	3,5
<i>Sum per cycle</i>			414	7,6	11,5
<i>1.3. Cycle of professional and practical training *</i>					
1	Computer aided design systems	1, 2	108	2,0	3,0
2	Theory of designing of agricultural machines	1	144	2,7	4,5
3	Mechatronic systems of agricultural technique	2	90	1,7	2,5
4	Theory of technical systems	3	126	2,3	3,5
<i>Sum per cycle</i>			468	8,7	13,5
<i>Sum per normative disciplines</i>			990	18,3	28,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by students</i>					
<i>2.1.1. Cycle of professional and practical training *</i>					
1	Foreign language	1	54	1,0	1,5
2	Engineering of systems of nature using	2	90	1,7	2,5
3	Patent science and copyright	1	54	1,0	1,5
4	International standardization and certification of technologies, raw-materials, and end products of agriculture	1	54	1,0	1,5
5	Mechanics of technical systems constructions	2	180	3,3	5,0
6	History of techniques	1	54	1,0	1,0
<i>Sum per cycle</i>			486	9,0	13,0
Production oriented disciplines					
Master's program “Constructing, designing and testing of machines of agricultural production”					
1	Methods of construction of agricultural technique	3	144	2,7	3,5
2	Reliability of agricultural machines	1	162	3,0	4,0
3	Testing of agricultural technique	3	126	2,3	3,5
4	Design of machines and equipment in animal husbandry	3	126	2,3	3,5
5	Design of machines and equipment in bioenergetics	3	126	2,3	3,5
<i>Sum per disciplines of university's choice</i>			1170	21,6	31,0
Research oriented disciplines					
Master's program “Mechatronic systems of machines of agricultural production”					
1	Testing and certification of agricultural technique	3	126	2,3	3,5
2	Modern experimental methods of research of agricultural technique	3	126	2,3	3,5
3	Dynamics of technical systems	3	144	2,7	4,0
4	Optimization of constructions of technical systems	1	126	2,3	3,5
5	Reliability of technical systems	2	162	3,0	3,5
<i>Sum per disciplines of university's choice</i>			1170	21,6	31
<i>2.2. Disciplines chosen by students</i>					
<i>2.2.1. Cycle of professional and practical trainings *</i>					
Production oriented disciplines					
Master's program “Constructing, designing and testing of machines of agricultural production”					
1	Dynamics of machines	3	126	2,3	3,5
2	Design of vibration machines	2	108	2,0	3,5

**MASTER DEGREE PROGRAMS**

№	Name of educational discipline, practical training	Semester	Amount		
			hours	credits	
				national	ECTS
3	Design of operating devices of agricultural machines	3	90	1,7	2,5
4	Mechanics of environments	2	72	1,3	2,0
5	Theory of mechatronic systems of agricultural machines	2	72	1,3	2,5
6	Mechatronics	3	72	1,3	2,0
<i>Sum per disciplines of student's choice</i>			540	9,9	16,0
Research oriented disciplines					
Master's program "Mechatronic systems of machines of agricultural production"					
1	Mathematical modelling of technical systems	3	126	2,3	3,5
2	Modern methods of designing of agricultural machines	2	108	2,0	3,0
3	Vibrational processes in agricultural technics	3	90	1,7	2,5
4	Mechanics of contact interaction of operational devices with agricultural materials	3	108	2,0	3,5
5	Modern mechatronic technical systems	3	108	2,0	3,5
<i>Sum per disciplines of student's choice</i>			540	10,0	16,0
Sum per selective component			1710	31,7	47,0
Practical trainings			360	6,7	10,0
Preparing and defense of Master's thesis			180	3,3	5,0
Sum per program			3240	60,0	90,0

\* Names of discipline cycles according to the requirements of industry standards for higher education, approved on 27.08.2010, EQC and EPP.

### Annotations of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### 1.1. Cycle of humanitarian and socio-economic training \*

**Philosophy of science.** Course provides to students a complete list of the basic problems of philosophy of science at the objective, ideologically unbiased contemporary vision of modern science, the synthesis of the knowledge gained in professional and humanities disciplines to a holistic worldview for creating of foundations of methodological and humanitarian components of the Master.

**Business foreign language.** The study of this discipline allows learning the knowledge and skills that will provide the necessary to master communicative ability in the field of professional communication at scientific conferences by specialty, research reports, business meetings and negotiations in a foreign language.

##### 1.2. Cycle of natural (fundamental) training \*

**Automation of technical systems.** Discipline course allows preparing Master's course students for deciding of issues of process automation systems for fixed and mobile technical equipment in the modern scientific and technological level and improving the efficiency of operation of automatic and automated systems.

**Applied computer technologies.** The study of this discipline can improve the applied theoretical and practical professional skills of future Master's engineers by their knowledge of modern computer technology in various technological systems, learning features and methods of use, mastering the necessary techniques and practical skills with computer applications for production purposes of Agricultural Engineering.

**Measuring devices and methods of measurement.** This discipline reveals the future design engineers basics of theoretical knowledge on measurement, evaluation and processing of measurement results, introduces the principles of the modern electronic and electric measuring devices, display products, measuring information systems, as well as the prospects of measuring instruments.

*1.3. Cycle professional and practical training \**

**Computer-aided design systems.** Discipline involves raising a comprehensive theoretical and practical professional skills of future engineers-designers by familiarizing them with contemporary CAD various classes, the mastery of the necessary techniques and skills of implementation of development activities using major CAD systems.

**Theory of designing of Agricultural machines.** This discipline studies methods of calculation and design at all stages of development of technical means, schemes of construction and operation of objects of modern new equipment for agriculture.

**Mechatronic system of agricultural technique.** The course of this discipline reveals the principles of the structure and General algorithms of functioning of mechatronic systems, which are used in agriculture, their calculation, design and features of use in practice.

**Theory of Technical Systems** The discipline aimed to study the main provisions of the systematic examination of the goals of technical systems of machines and equipment for agricultural production and familiarization with the constructive solution methods. In this case, any technical system is viewed as a process of interaction of its elements in space and time.

## **2. ELECTIVE ACADEMIC DISCIPLINES**

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training \**

**Foreign Language.** The study of this discipline allows you to learn a foreign language: learn to speak, read and translate literature on a speciality, to participate in a conversation in a foreign language for professional purposes.

**Engineering of systems of nature using.** The direction of the discipline consists in studying by specialists of the scientific-production basics and prospects of development of alternative energy, in particular solar, wind, renewable biomass. Calculated constructive-technological parameters of the equipment for reception of energy from alternative sources, analyzes the energy, environmental and economic performance of gas, liquid and solid biofuels.

**Patent science and copyright.** The study of this discipline allows receiving future specialists in the field of agricultural mechanical engineering of the necessary knowledge of the system of intellectual property protection, the ability to apply in practice methods of legal protection of scientific and technical achievements and creative products.

**International standardization and certification of technologies, raw-materials, and end products of agriculture.** The course of this discipline allows students acquire knowledge of the basic principles of international and regional organizations on standardization and certification; the main provisions of international and European legislation in these spheres.

**Mechanics of technical systems constructions.** The discipline studies the phenomena that affect the operability of technical systems considering the constructive and technological methods of improving structures machines, in terms of energy intensity, metal, etc.; provides a theoretical justification for the required accuracy of elements of structures of technical systems and methods for achieving it.

**History of techniques.** The discipline considers the questions of evolution of technology, technical solutions, design errors, external factors that will be useful in creating new or improving the existing machinery and equipment.

*Production oriented disciplines*

**Master program “Constructing, designing and testing of machines of agricultural production”**

**Methods of construction of agricultural technique.** The discipline course is aimed to study of existing methods of constructing of agricultural equipment, mastering of functionality and their usage patterns, mastering the essential techniques and practical skills of performance of works with application of methods for designing of industrial purpose agricultural machinery.

**Reliability of agricultural machines.** It is a complex discipline that studies the regularities of change of a technical condition of machines and their elements in the process of exploitation, studies the implementation of methods and ways of elimination of defects and damages, discloses the methods of making surfaces of the parts necessary physical-mechanical properties by: surfacing, spraying, use of polymers, electroplating, plastic deformation, electrical methods of processing and restore the health of agricultural machinery..

**Testing of Agricultural technique.** Course in the discipline aimed to study engineering test methods for agricultural technology, which allows getting an objective assessment of the design, technological and service properties of equipment and determining their compliance with technical requirements and current technological requirements on workflows.

**Designing of machines and equipment in animal husbandry.** This discipline allows mastering the methods of design and development work items of machinery, equipment, production of mechanized production lines in animal husbandry, systematization and consolidation of knowledge on technology, mechanization, ecology and safety of livestock production.

**Designing of machines and equipment in bioenergy.** The course includes the fundamentals of designing machines and equipment for bioenergy production in agroindustrial complex, and peculiarities of their choice of rational constructive-technological parameters of optimization of technological processes of bioenergy.

*Research oriented disciplines*

**Master program “Mechatronic systems of machines of agricultural production”**

**Testing and certification of agricultural technique.** The course of the discipline aimed to study of engineering methods of testing and certification of agricultural technology, which allows getting an objective assessment of the design, technological and service properties of equipment and determining their compliance with technical requirements and current technological requirements on workflows.

**Modern experimental methods of research of agricultural technique.** In this discipline there are studied methods of experimental investigations of the processes, operations, systems, methods of formalization of processes and their modelling, analysis, methods improvement, forecasting and performance measurement processes and systems in the agricultural technique.

**Dynamics of technical systems.** It is focused on the development of dynamic models of specific systems of machines and equipment for agricultural production, their mathematical description, calculation of current dynamic loads, which are determined on base of the initial conditions for the subsequent calculations on durability, performance, and reliability of machines.

**Optimization of constructions of technical systems.** The discipline studies the methods of optimization of structures of technical systems, principles and fundamentals of modelling of controlled technical systems of modern industrial and agricultural production.

---



**Reliability of technical systems.** It is a complex discipline that studies: the concept of technical systems and their classification; schemes of reliability of technical systems and their analysis; methodology for optimization of the number of backup systems elements; graph theory; tools of the logical-simulation modelling for the research of reliability of technical systems; methods of ensuring reliability of agricultural machinery, as technical systems.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training \**

*Production oriented disciplines*

**Master program “Constructing, designing and testing of machines of agricultural production”**

**Dynamics of machines.** It aims at determining the dynamic models of specific machinery and equipment for agricultural production, their mathematical description, calculation of current dynamic loads to reduce them during operation.

**Design of vibration machines.** The discipline studies the basics of methods of analytical description and calculation of fluctuations and motion of mechanical systems and general design principles of vibrating machines, in particular, the main types of calculations of their parameters and generation tools of mechanical vibrations and pulses and structural features of machinery vibration of agriculture.

**Design of operating devices of agricultural machines.** The course of this discipline is directed on knowledge of the existing foundations of the design of operating devices of the agricultural machines, the assimilation of functionality and their usage patterns, mastering the essential techniques and practical skills of performance of works with the use of methods of designing of industrial purpose agricultural machinery.

**Mechanics of environments.** This discipline allows you to learn the basics of theoretical knowledge and practical skills related to the interaction of working bodies of machines and equipment, aimed at the change of properties and fracture of materials and environments, which are the basis of most processes in agriculture.

**Theory of mechatronic systems of agricultural machines.** The discipline studies the theoretical basics of construction of mechatronic systems, methods of their control and automatic means of implementation of mechatronic systems in agricultural machines.

**Mechatronics.** Course of this subject aims to familiarize with the basic provisions and directions of use of mechatronics, which studies patterns, computer-controlled machine and functions and structures equipment and software management.

*Research oriented disciplines*

**Master program “Mechatronic systems of machines of agricultural production”**

**Mathematical modelling of technical systems.** It is a complex discipline that studies the methods and ways of reception, processing, presentation and use of information about the objects that interact with each other and external environment in order to predict the reaction of the object on control actions, its analysis of sensitivity to various factors when saving in the mathematical description of the physical adequacy of the real object.

**Modern methods of designing of agricultural machines.** The discipline studies the analytical and experimental methods for the development of mathematical models of technological facilities of the agrarian industry, methods of formalization of object and algorithmic of the process of functioning of systems of automation equipment, methods of identification of technological objects by their frequency, pulse and transient, statistical methods for the identification of elements of the correlation and spectral analysis.

---

**Vibrational processes in agricultural technics.** The discipline studies the vibrational processes in the agricultural technique and the main provisions and principles of construction of their mathematical models, and application of the method of theoretical researches, development of the theory of vibration of operating devices of agricultural machines and equipment.

**Mechanics of contact interaction of operational devices with agricultural materials.** The course of this discipline focuses on introducing the foundations of theoretical knowledge and practical skills related to the interaction of working bodies of machines and equipment, aimed at the change of properties and fracture of materials and environments, which are the basis of most processes in agriculture.

**Modern mechatronic technical systems.** The discipline studies the modern mechatronic systems, which are used in industrial and agricultural production, their structural-functional features, principles, and possible applications in other branches of modern production.

---

**Master Training**  
**in specialty “ORGANIZATION OF TRANSPORTATION AND MANAGEMENT OF**  
**TRANSPORT”**  
**Branch of knowledge “Transport and Transport Infrastructure”**

<b>Branch of knowledge</b>	
– full-time	<b>15</b>
– correspondence	<b>15</b>
<b>Term of study</b>	<b>1.5 years</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian, English</b>
<b>Qualification of graduates</b>	<b>Master (Technical), Researchers in Transport Sector</b>

**The concept of training**

Of knowledge, skills and professional skills of new generation of innovation in field of traffic and transport management (road transport) objects agricultural and environmental systems based on modern standards of education adapted to requirements of world's best educational programs for public and private sectors Ukraine.

**Production oriented master program**

**Master program “Management of automobile transportation of agricultural products in terms of environmental and economic constraints”.**

Design of transportation facilities and motor loading and unloading in production of agricultural products. The object of research is specificity and diversity of agricultural goods, terms and conditions of carriage, freight flows in short, medium and long distances.

**Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4th level of qualification according to state classifications of professions traffic controllers, engineers traffic services and logistics managers of trucking companies, transport managers of major corporations, specialist of road transport and infrastructure engineer in control State Automobile Inspectorate, researchers research and design institutes vehicle type; teachers in driving schools, secondary vocational and higher education establishments.

**Practical training**

Through laboratory and workshops, training, technology, research, undergraduate and other practices in fields of crops, livestock, technical service, conservation, processing and storage of crop production technology of biodiesel production, breeding, legal values, economics, accounting, marketing and management in field of agricultural production. These databases are: John Deere Ukraine, Ukraine Amaco, Mironovsky ZVVK, Astra, Police District MO Department of Internal Affairs in Ukraine (Kiev, Crimea, Cherkasy, Khmelnytsky, Chernihiv, Zhytomyr, Rivne, Volyn, Poltava, etc.) and the Office of Research Affairs GA Ukraine, while others base practical training of students (trainees) from among leading university institutions, enterprises, organizations of any ownership in Ukraine and abroad, with adequate facilities for student practice in accordance with educational and vocational training programs.

**Proposed Topics for Master Theses**

1. Research of technical and economic parameters of automobile through effective implementation of logistics approaches.

---

**MASTER DEGREE PROGRAMS**

2. Improve handling operations for transportation of vegetables and fruit loads in agricultural farm system.
3. Improving transport and production process for harvesting grain using body.
4. Justification of transport and production process for collecting corn.
5. Improving transport and production process for transportation of dairy products in Kiev region.
6. Justification of transport and production process for making organic fertilizer.
7. Investigation of the main indicators of road transport and improvement of "Promin", Kyiv region.
8. Improving transport and process transport of sugar beet in agricultural farm.
9. Improving transport and production process for transportation of fertilizers at "Svitoch" Vinnitsa region.
10. Improving transport and logistics processes for transportation of fruits and berries in agricultural farm.

**Academic rights of applicants for a master program**

In addition to specialty "Organization of Transportation and Transport Management (Road Transport)" applicants with Bachelor's Degree with specialty "Transport Technologies (by mode)" can continue studying the **field of knowledge 1801 "Specific categories"**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Organization of Transportation and Transport Management (Road Transport)”**

№	Discipline, practice	Semester	Number		
			hours	credits	
				National	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<b>1.1. Cycle of humanitarian and socio-economic training*</b>					
1	Business Foreign Language	1	144	2,7	4,0
2	Foreign Language Scientific Communication	1	144	2,7	4,0
3	Physical Education	1	36	0,7	1,0
4	Civil Defense	2	36	0,7	1,0
Total for Cycle			360	6,7	10,0
<b>1.2. Cycle professional and practical training *</b>					
1	Project Analysis	2	180	3,3	5,0
2	Methods Research	3	180	3,3	5,0
3	Supply chain management	2	144	2,7	4,0
4	Freight forwarding activities	2,3	252	4,7	7,0
5	Safety in Transport	3	72	1,3	2,0
6	Transport Economics	3	108	2,0	3,0
Total for Cycle			936	17,3	26,0
Total for normative academic disciplines			1296	24,0	36,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<b>2.1.1. Cycle professional and practical training*</b>					
1	Roads of internal appointment	1	198	3,7	5,5
2	Navigation Systems Transport	1	198	3,7	5,5
3	Sanitation and Hygiene vehicles	1	162	3,0	4,5

## MASTER DEGREE PROGRAMS

4	Loads agriculture	2	162	3,0	4,5
5	Recycling Vehicle	2	108	2,0	3,0
6	Planning of maintenance vehicles	3	162	3,0	4,5
Total of University Elective			990	18,3	27,5
2.2. Disciplines chosen by student					
2.2.1. Cycle professional and practical training *					
1	Decision theory in ecological and environmental constraints	2	72	1,3	2,0
2	Quality management vehicles	3	72	1,3	2,0
Total of chosen by student			144	2,7	4,0
Total for Selective academic disciplines			1134	21,0	31,5
Practical training			522	9,7	13,5
State certification (protection master dissertation)			288	5,3	9,0
Total for Master's			3240	60,0	90,0

\* Names cycles disciplines according to requirements of industry standards for higher education, approved on 27.08.2010, EQC and EPP.

### Annotations of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### *1.1. Cycle of humanitarian and socio-economic training\**

**Business Foreign Language.** Acquiring knowledge and skills that will provide necessary communicative capacity for masters in field of professional communication in organization and management of traffic on road transport industry.

**Foreign Language Scientific Communication.** Acquiring knowledge and skills that will provide necessary communicative capacity for masters in fields of scientific communication in organization and management of traffic on road transport industry.

**Physical Education.** The study of principles of healthy lifestyle, education needs in physical self-improvement, formation of sport and technical skills of self-control during physical perfection.

**Civil Defense.** Teach future professionals ability to predict extent of emergency, to prevent their occurrence, to determine protection of people, organize and carry out rescue and other emergency work in aftermath of accidents, natural disasters and lesions, organize activities to improve stability of objects of traffic and control motor industry.

##### *1.2. Cycle professional and practical training \**

**Project analysis.** Skills of analysis of diverse projects of transportation and control motor, and increase their efficiency. It focuses on use of automated systems analysis projects, generated in specialized application packages and individual calculation and analytical methods.

**Methods Research.** Raising comprehensive theoretical and practical level of future Masters of Engineering-Transport by mastering basics of theoretical knowledge and practical skills of general concept of experimental methods of traffic management and road transport industry.

**Supply chain management.** Development of theoretical foundations of supply chain management, exploring key business processes in supply chain, acquiring skills of design and planning of supply chains, learn basics of creating single information space of supply chain participants, review criteria of quality and efficiency of supply chains.

**Freight forwarding activities.** Formation of system knowledge and practical skills of transport and logistics activities for its kinds and forms, especially processes of transport service. In accordance with methods of transport and forwarding services, determine parameters of transport service, promising directions for further development of transport service and determine its effectiveness.

**Safety in transport.** Acquiring skills to develop innovative organizational measures to prevent accidents, injuries and illness in organization and management of traffic on road transport industry.

**Transport Economics.** Is to explore relationship in middle of process systems, acquiring skills of planning, pricing and investment, determining efficiency of organization and management of traffic on road transport industry.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle professional and practical training \**

**Roads of internal appointment.** Acquiring skills to develop innovative arrangements for operation and effectiveness of internal road design purposes, to prevent accidents, injuries and illness in organization and management of traffic on road transport industry.

**Navigation Systems Transport.** Gaining knowledge and skills that are aimed at creation and use of road transport navigation subsystems, links and systems of vehicles. Learning basics of information analysis and synthesis navigation systems on vehicles with computer systems at various levels and purposes.

**Sanitation and Hygiene vehicles.** Formation of theoretical knowledge of students regarding species transport for animals and their products, modern methods and techniques sanitization transport, packaging, machinery and equipment. The discipline combines technological knowledge possessed by student hygienic norms and processes that are necessary for growing animals, livestock production, its transportation and sale.

**Loads agriculture.** Disclosure of nature and methods of developing set of rules to use full potential vehicles for transport of specific characteristics of agriculture and natural production conditions, identifying the need for these tools to achieve preset outcomes and compliance.

**Recycling vehicles.** Uncovering design methodology recycling systems at various levels, concept of recycling, mechanism of organizational coordination forms of interaction organizations, able to: draft recycling system, analyze recycling environmental paint algorithm "problem" formation recycling systems, develop organizational structure recycling system, identify and analyze business processes organizations use principles of recycling system optimization.

**Planning of maintenance vehicles.** Providing knowledge on methods and tools supporting technical condition of vehicles, its assemblies, systems and mechanisms, organizations, service and maintenance vehicles.

### *2.2. Disciplines chosen by student*

#### *2.2.1. Cycle professional and practical training \**

**Decision theory in ecological and environmental constraints.** The study of nature and basic concepts and principles of decision theory concepts in ecological and environmental constraints, concept of biosphere as dynamic system, basic information about global environmental problems humanity – resources and development of human impacts on biosphere; qualitative and quantitative criteria for stability of natural ecosystems, development and modeling of sustainable development, economic, social, political, environmental and ethical issues of development and problems of managerial decisions.

**Quality management vehicles.** Gaining knowledge appropriate to current level in field of quality vehicles, familiarity with major advances in theory and practice of quality management in different countries, need to use advances in quality management, its organizational systems, need to transition to production control production "through quality" of applying international standards ISO 9000, adopted in Ukraine as national.

---

**Master Training  
in specialty “TRAFFIC ORGANIZATION AND CONTROL”  
Branch of knowledge “Transport and Transport Infrastructure”**

**Form of training, licensed number of students:**

– full-time 15

– correspondence 15

**Term of study** 1.5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian, English

**Qualification of graduates** Master (Technical), Researchers in Transport Sector

**The concept of training**

Of knowledge, skills and professional skills of new generation of innovation in organization and regulation of traffic objects agricultural and environmental systems based on modern standards of education adapted to requirements of world's best educational programs for public and private sectors in Ukraine.

**Production oriented master program**

**Master Program “Technology of Traffic Design”**

Development of methods to improve the performance of existing regimes in transport networks based on safety, economy of motion and its effects on environment (including conditions in rural areas). Investigation of changes in traffic flows during harvest on critical areas of transport networks.

**Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4th level of qualification by state classifications of professions: engineers on organization and safety in transportation enterprises, specialists of surveillance of highways, road-maintenance and road-maintenance departments, engineers Division of Safety and State Automobile Inspectorate, insurance experts, academic staff research and design institutes vehicle type; teachers in driving schools, secondary vocational and higher education establishments.

**Practical training**

Through laboratory and workshops, training, technology, research, undergraduate and other practices in fields of crops, livestock, technical service, conservation, processing and storage of crop production technology of biodiesel production, breeding, legal values, economics, accounting, marketing and management in field of agricultural production. These databases are: John Deere Ukraine, Ukraine Amaco, Mironovsky ZVVK, Astra, Police District MO Department of Internal Affairs in Ukraine (Kiev, Crimea, Cherkasy, Khmelnytsky, Chernihiv, Zhytomyr, Rivne, Volyn, Poltava, etc.) and the Office of Research Affairs GA Ukraine, while others base practical training of students (trainees) from among the leading university institutions, enterprises, organizations of any ownership in Ukraine and abroad, with adequate facilities for student practice in accordance with educational and vocational training programs.

**Proposed Topics for Master Theses**

1. Improving traffic management in rural areas.
  2. Improving safety in countryside.
-

**MASTER DEGREE PROGRAMS**

3. Improvements of road transport on the stretch of road in the countryside. Improvement of traffic and improve road safety transport hub in countryside.
4. Improvement of work safety in passenger fleets in rural areas in implementation of intra-traffic.
5. Improvements of road transport on stretch of road in countryside.
6. Improvement of work safety in passenger fleets rural areas in inner-traffic.
7. Research transportation logistics process in rural areas.
8. Research and improvement of transport of heavy cargo transport enterprise for example in rural areas.
9. Improving transport and logistics processes for transportation of fruits and berries in agricultural farm.

**Academic rights of applicants for a master program**

In addition to specialty "Organization and regulation of traffic" applicants with Bachelor's Degree with specialty "Transport Technologies (by mode)" can continue studying the field of **knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
- 8.18010021 – "Pedagogy of Higher School" (see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – "Educational Institution Management" (see p. 427).

**Curriculum for specialist training of the educational and qualification level "Master" in specialty "Organization and Regulation of Traffic"**

№	Discipline, practice	Semester	Number		
			hours	credits	
				National	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian and socio-economic training*</i>					
1	Business Foreign Language	1	144	2,7	4,0
2	Foreign Language Scientific Communication	1	144	2,7	4,0
3	Physical Education	1	36	0,7	1,0
4	Civil Defense	2	36	0,7	1,0
Total for Cycle			360	6,7	10,0
<i>1.2. Cycle professional and practical training *</i>					
1	Project Analysis	2	180	3,3	5,0
2	Methods Research	3	180	3,3	5,0
3	Special methods of traffic	1	180	3,3	5,0
4	Transport planning large and significant cities	2	216	4,0	6,0
5	Automated Systems of Traffic Control	3	126	2,3	3,5
6	Economy of Traffic	3	108	2,0	3,0
7	Safety in Transport	3	72	1,3	2,0
Total for Cycle			1062	19,7	29,5
Total for normative academic disciplines			1422	26,4	39,5
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle professional and practical training*</i>					
1	Sanitation and Hygiene Vehicles	1	144	2,7	4,0
2	Loads agriculture	1	198	3,7	5,5
3	Quality Management Vehicles	2	198	3,7	5,5
4	Transport Planning Villages	3	90	1,7	2,5
5	Monitoring and reviewing vehicles	3	198	3,7	5,5
Total for normative academic disciplines			828	15,3	23,0
<i>2.2. Disciplines chosen by student</i>					
<i>2.2.1. Cycle professional and practical training *</i>					



## MASTER DEGREE PROGRAMS

1	Decision theory in ecological and environmental constraints	2	90	1,7	2,5
2	Quality management vehicles	3	90	1,7	2,5
Total of chosen by student			180	3,4	5,0
Total for Selective academic disciplines			1008	18,7	28,0
Practical training			522	9,6	13,5
State certification (protection master dissertation)			288	5,3	9,0
Total for Master`s			3240	60,0	90,0

\* Names cycles disciplines according to requirements of industry standards for higher education, approved on 27.08.2010, EQC and EPP.

### Annotations of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### *1.1. Cycle of humanitarian and socio-economic training \**

**Business Foreign Language.** Acquiring knowledge and skills that will provide necessary communicative capacity for masters in field of professional communication in organization and management of traffic on road transport industry.

**Foreign Language Scientific Communication.** Acquiring knowledge and skills that will provide necessary communicative capacity for masters in fields of scientific communication in organization and management of traffic on road transport industry.

**Physical Education.** The study of principles of healthy lifestyle, education needs in physical self-improvement, formation of sport and technical skills of self-control during physical perfection.

**Civil Defense.** Teach future professionals ability to predict extent of emergency, to prevent their occurrence, to determine protection of people, organize and carry out rescue and other emergency work in aftermath of accidents, natural disasters and lesions, organize activities to improve stability of objects of traffic and control motor industry.

##### *1.2. Cycle professional and practical training \**

**Project analysis.** Skills of analysis of diverse projects of transportation and control motor, and increase their efficiency. It focuses on use of automated systems analysis projects, generated in specialized application packages and individual calculation and analytical methods.

**Methods Research.** Raising comprehensive theoretical and practical level of future Masters of Engineering-Transport by mastering basics of theoretical knowledge and practical skills of general concept of experimental methods of traffic management and road transport industry.

**Supply chain management.** Development of theoretical foundations of supply chain management, exploring key business processes in supply chain, acquiring skills of design and planning of supply chains, learn basics of creating single information space of supply chain participants, review criteria of quality and efficiency of supply chains.

**Freight forwarding activities.** Formation of system knowledge and practical skills of transport and logistics activities for its kinds and forms, especially processes of transport service. In accordance with methods of transport and forwarding services, determine parameters of transport service, promising directions for further development of transport service and determine its effectiveness.

**Safety in transport.** Acquiring skills to develop innovative organizational measures to prevent accidents, injuries and illness in organization and management of traffic on road transport industry.

**Transport Economics.** Is to explore relationship in middle of process systems, acquiring skills of planning, pricing and investment, determining efficiency of organization and management of traffic on road transport industry.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle professional and practical training \**

**Roads of internal appointment.** Acquiring skills to develop innovative arrangements for operation and effectiveness of internal road design purposes, to prevent accidents, injuries and illness in organization and management of traffic on road transport industry.

**Navigation Systems Transport.** Gaining knowledge and skills that are aimed at creation and use of road transport navigation subsystems, links and systems of vehicles. Learning basics of information analysis and synthesis navigation systems on vehicles with computer systems at various levels and purposes.

**Sanitation and Hygiene vehicles.** Formation of theoretical knowledge of students regarding species transport for animals and their products, modern methods and techniques sanitization transport, packaging, machinery and equipment. The discipline combines technological knowledge possessed by student hygienic norms and processes that are necessary for growing animals, livestock production, its transportation and sale.

**Loads agriculture.** Disclosure of nature and methods of developing set of rules to use full potential vehicles for transport of specific characteristics of agriculture and natural production conditions, identifying the need for these tools to achieve preset outcomes and compliance.

**Recycling vehicles.** Uncovering design methodology recycling systems at various levels, concept of recycling, mechanism of organizational coordination forms of interaction organizations, able to: draft recycling system, analyze recycling environmental paint algorithm "problem" formation recycling systems, develop organizational structure recycling system, identify and analyze business processes organizations use principles of recycling system optimization.

**Planning of maintenance vehicles.** Providing knowledge on methods and tools supporting technical condition of vehicles, its assemblies, systems and mechanisms, organizations, service and maintenance vehicles.

### *2.2. Disciplines chosen by student*

#### *2.2.1. Cycle professional and practical training \**

**Decision theory in ecological and environmental constraints.** The study of nature and basic concepts and principles of decision theory concepts in ecological and environmental constraints, concept of biosphere as dynamic system, basic information about global environmental problems humanity – resources and development of human impacts on biosphere; qualitative and quantitative criteria for stability of natural ecosystems, development and modeling of sustainable development, economic, social, political, environmental and ethical issues of development and problems of managerial decisions.

**Quality management vehicles.** Gaining knowledge appropriate to current level in field of quality vehicles, familiarity with major advances in theory and practice of quality management in different countries, need to use advances in quality management, its organizational systems, need to transition to production control production "through quality" of applying international standards ISO 9000, adopted in Ukraine as national.

---

**Master Training  
in specialty “MECHANIZATION OF AGRICULTURAL”  
Branch of knowledge “Machinery and Energetic of Agrarian Production”**

**Form of training, licensed number of students:**

– full-time 150

– correspondence 125

**Term of study** 1.5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian, English

**Qualification of graduates** Master (Technical), Engineer-Research of Mechanization's Agriculture

**The concept of training**

Knowledge, skills and professional skills of new generation of innovation in agricultural mechanization of agriculture and environmental protection facilities systems based on modern standards of education adapted to requirements of world's educational programs for public and private sectors in Ukraine.

**Production oriented master program**

***Master program “Technology and Techniques in Planting”***

Optimization of complex machinery and equipment with modern technology for crop mechanization of crop production. Planning and organization processes, research credibility and reliability of machines and construction equipment.

**Sphere of graduates employment**

Receive higher education and can work in positions that correspond to th level of qualification according to state classifications of occupations and heads production line supervisor, shift supervisor, managers of small businesses with administrative staff, engineers, mechanics, engineers, technical diagnostics of tractor park, engineers, safety engineers.

***Master program “Technology and Techniques in Livestock”***

Optimization of complex machinery and equipment with modern technology mechanized livestock and poultry industry. Research reliability and reliability of designs of machines and equipment.

**Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4th level of qualification according to state classifications of occupations and heads production line supervisor, shift supervisor, managers of small businesses with administrative staff, engineers, mechanics, engineers, technical diagnostics of machinery and equipment livestock, engineers, safety engineers.

***Master program “Technology and Techniques of Processing AgroIndustries”***

Optimization of complex machinery and equipment with modern technology mechanized processing and storage of agricultural products. Research reliability and reliability of designs of machines and equipment in meat packing industry.

**Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4th level of qualification according to state classifications of occupations and heads production line supervisor, shift supervisor, managers of small businesses with administrative staff, engineers, mechanics, engineers, technical diagnostics of machinery processing industries, engineers, safety engineers.

***Master program “Technology and Equipment of Service Enterprises”***

Optimization of complex equipment with modern processes of agricultural machinery maintenance and restoration parts. Study parameters and modes of process equipment, design is not standardized equipment.

**Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4th level of qualification according to state classifications of occupations and heads production line supervisor, shift supervisor, managers of small businesses with administrative staff, engineers, mechanics, engineers, technical diagnostics of the equipment service companies, engineers, safety engineers.

***Master program “Technology and Techniques in Biological Systems”***

Design process and rationale hardware parameters for complex biotechnological production of biomass energy products and agricultural waste. Efficacy of biofuels in modern engines.

**Sphere of graduates employment**

receive higher education and can work in positions that correspond to 4th level of qualification according to state classifications of occupations and heads production line supervisor, shift supervisor, managers of small businesses with administrative staff, engineers, mechanics, engineers, technical diagnostics of biological systems engineering, safety engineers.

***Master program “Safety Principles of AgroBioEngineering”***

Development of safety management energy and resource and engineering tools to prevent negative impact of production processes in agriculture on environment, grounding hardware safety parameters.

**Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4th level of qualification according to state classifications of occupations and heads production line supervisor, shift supervisor, managers of small businesses with administrative staff, engineers, mechanics, engineers, health and safety.

**Research oriented master program**

***Master program “Mechatronic Systems and Technology of AgroIndustrial Complex”***

Simulation and optimization of traffic engineering agriculture. Design of optimal control systems traffic engineering agriculture based on modern mechatronic systems. Choosing structure and composition of mechatronic systems, depending on purpose of art. Development of software for optimal motion control technology of AgroIndustrial Complex.

---

### **Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4th level of qualification of professions: teaching, research, organizational and administrative activity in research departments of companies, research institutions and design, as well as universities as head of production units in agroindustry, and heads production line supervisor, shift supervisor, head of laboratory (education), executives student research office, practice managers, heads of research laboratories, scientists, mechanical engineers, assistants and lecturers universities.

#### ***Master program “Technical Service of Machinery and Equipment”***

Optimization of parameters and technical service of modern technology. Design methods and means of diagnosing energy-technology. Organization and technological preparation service agent service. Research the causes of failures and flow of agricultural technology in different environments and work areas.

### **Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4th level of qualification by professions: teaching, research, organizational and administrative activity in research departments of companies, research institutions and design, as well as universities as head of production units in agroindustry, and heads production line supervisor, shift supervisor, head of laboratory (education), executives student research office, practice managers, heads of research labs, heads of small businesses with administrative staff, research staff; mechanical engineers, engineers with technical diagnostics of machine-tractor fleet, engineers, designers, engineers, safety engineers, assistants and lecturers in higher education.

#### ***Master program “Optimization of Parameters and Exploitaion Regimes of Agricultural Machinery”***

Improving reliability of agricultural machinery based on structural analysis of reliability and rational reasoning processes, parameters and operating modes. Research and design of technological and kinematic schemes, units, assemblies, work agencies.

### **Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4th level of qualification by professions: teaching, research, organizational and administrative activity in the research departments of companies, research institutions and design, as well as universities as head of production units in agroindustry, and heads production line supervisor, shift supervisor, head of the laboratory (education), executives student research office, practice managers, heads of research laboratories, scientists, mechanical engineers, assistants and lecturers universities.

#### ***Master program “Optimize Conveying Processes in Agriculture”***

Research and development of optimal schemes perform handling operations of agricultural loads. Rationale and select required lifting equipment, as well as its structural and technological parameters of transport of agricultural loads. Optimization of traffic enforcement job of handling machines.

### **Sphere of graduates employment**

Receive higher education and can work in positions that correspond to 4-th level of qualification by professions: teaching, research, organizational and administrative activity in research departments of companies, research institutions and design, as well as universities as head of production units in agroindustry, and heads production line

---

supervisor, shift supervisor, head of laboratory (education), executives student research office, practice managers, heads of research laboratories, scientists, mechanical engineers, assistants and lecturers universities.

### **Practical Training**

Through laboratory and workshops, training, technology, research, undergraduate and other practices in fields of crops, livestock, technical service, conservation, processing and storage of crop production technology of biodiesel production, breeding, methods of mechanized diagnostics and prevention animal diseases, technology repairs of agrarian machinery, testing agrarian technology and its legal significance, economics, accounting, marketing and management in agricultural production. These databases are: Ukrainian Research Institute of Forecasting and Testing of Equipment and Technologies for Agricultural Production by Leonid Pogoreliy, National Scientific Centre "Institute of Mechanization and Electrification of Agriculture", "Technical Service", "Rayagrotech Service", "Concord-Agro", Agrofirma "Mriya", "Concern "Simex-Agro", while others base practical training of students (trainees) from among leading university institutions, enterprises, organizations of any ownership in Ukraine and abroad, with adequate facilities for student practice in accordance with educational and vocational training programs.

### **Proposed Topics for Master Theses**

1. Improving structural chart and determine the parameters counter group milk yield.
2. Improving parallel driving machine-aggregates.
3. Improving process and repair of tractors using statistical processing parameter flow reply.
4. Determination of process parameters and settings for processing soybean thermal camera rotating type.
5. Identification and research of complex machines for cultivation and harvesting of wheat.
6. Influence of biodiesel on wear resistance of friction pairs of conjugate "steel on steel" in presence of abrasive.
7. Investigation of operational performance machine with tractor units when using fuels of vegetable origin.
8. Research and design of computer technology of biodiesel production process improvements to cavitation mixing of reagents.
9. Research major damages to development process of its repair.
10. Research damaged parts and process design recovery gear-wheel combine harvesters.

### **Academic rights of applicants for a master program**

In addition to specialty "Mechanization of Agriculture" applicants with Bachelor's Degree with specialty "Processes, Machines and Equipment of Agroindustrial Production" can continue studying the **field of knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
  - 8.18010021 – "Pedagogy of Higher School"(see p. 434);
  - 8.18010018 – Administrative management (see p. 397);
  - 8.18010020 – "Educational Institution Management" (see p. 427).
-

**MASTER DEGREE PROGRAMS**

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “Mechanization of Agriculture”**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Legislation and Law in Agriculture	1	180	3,3	5,0
2	Business Foreign Language	1, 2	180	3,3	5,0
3	Pedagogy	2	90	1,7	2,5
4	Economic of IT systems	3	90	1,7	2,5
<i>Total number</i>			540	10,0	15,0
<i>1.2. Cycle professional and practical training *</i>					
1	Theory and Methods of Research	2	198	3,7	5,5
2	Mechatronic Systems Technology	3	180	3,3	5,0
3	Design of Technical Process	3	252	4,7	7,0
4	Design of means and facilities services	4	180	3,3	5,0
5	Logistics of Agricultural Mechanization	4, 5	90	1,7	2,5
6	Innovative engineering technology	4	90	1,7	2,5
7	Occupational Health in Agriculture	4	90	1,7	2,5
8	Engineering Management	4, 5	180	3,3	5,0
<i>Total number</i>			1260	23,4	35
Total according to regulatory part			1800	33,4	50
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
Master of production specialization					
Master program “Technology and Techniques in Planting”					
2.1. Elective Courses University					
<i>2.1.1. Cycle professional and practical training*</i>					
1	Engineering and design of process plant systems	1,2	270	5,0	7,5
2	Management of machines in plant	3	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5
2.2. Disciplines chosen by student					
<i>2.2.1. Cycle professional and practical training *</i>					
1	Plant process safety	3	90	1,7	2,0
2	Environmental security processes in plant	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5
Master Program “Technology and Techniques in Livestock”					
2.3. Elective Courses University					
<i>2.3.1. Cycle professional and practical training*</i>					
1	Design and calculation technologic process in Livestock	1,2	270	5,0	7,5
2	Management of machines in livestock	3	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5
2.4. Disciplines chosen by student					
<i>2.4.1. Cycle professional and practical training*</i>					
1	Livestock process safety	3	90	1,7	2,0
2	Environmental security processes in livestock	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5
Master Program “Technology and Techniques of Processing AgroIndustries”					
2.5. Elective Courses University					
<i>2.5.1. Cycle professional and practical training*</i>					
1	Engineering and design of technological systems processing industries	1,2	270	5,0	7,5
2	Management of machines in processing agroindustries	3	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5

**MASTER DEGREE PROGRAMS**

2.6. Disciplines chosen by student					
2.6.1. Cycle professional and practical training*					
1	Processing agroindustries process safety	3	90	1,7	2,0
2	Environmental security processes in processing agroindustries	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5
Master's program "Technology and Equipment of Service Enterprises"					
2.7. Elective Courses University					
2.7.1. Cycle professional and practical training*					
1	Engineering and design of technological systems of Service Enterprises	1,2	270	5,0	7,5
2	systems management in Service Enterprises	3	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5
2.8. Disciplines chosen by student					
2.8.1. Cycle professional and practical training*					
1	Process safety in Service Enterprises	3	90	1,7	2,0
2	Environmental security processes in Service Enterprises	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5
Master Program "Technology and Techniques in Biological Systems"					
2.9. Elective Courses University					
2.9.1. Cycle professional and practical training*					
1	Biotechnological processes and equipment manufactures	1,2	270	5,0	7,5
2	Technology bioenergetics conversion	3	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5
2.10. Disciplines chosen by student					
2.10.1. Cycle professional and practical training*					
1	Process safety Biosystems	3	90	1,7	2,0
2	Environmental security processes Biosystems	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5
Master Program "Safety Principles of AgroBioEngineering"					
2.11. Elective Courses University					
2.11.1. Cycle professional and practical training*					
1	Organization of labor AgroBioEngineering	1,2	270	5,0	7,5
2	Theory AgroBioEngineering Security	3	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5
2.12. Disciplines chosen by student					
2.12.1. Cycle professional and practical training*					
1	Process safety AgroBioEngineering	3	90	1,7	2,0
2	Environmental security processes in AgroBioEngineering	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5
Master research specialization					
Master Program "Mechatronic Systems and Technology of AgroIndustrial Complex".					
2.13. Elective Courses University					
2.13.1. Cycle professional and practical training*					
1	Designing mechatronic systems	2, 3	270	5,0	7,5
2	Fundamentals of Mechatronics	1	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5
2.14. Disciplines chosen by student					
2.14.1. Cycle professional and practical training*					
1	Computer control of mechatronic systems	3	90	1,7	2,0
2	Mechatronic systems for agriculture	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5



## MASTER DEGREE PROGRAMS

Master Program "Technical Service of Machinery and Equipment".					
2.15. Elective Courses University					
2.15.1. Cycle professional and practical training*					
1	Design Process Service	2, 3	270	5,0	7,5
2	Planning and organization of enterprise technical services	1	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5
2.16. Disciplines chosen by student					
2.16.1. Cycle professional and practical training*					
1	Diagnosis and prediction of technical condition of machines	3	90	1,7	2,0
2	Testing agricultural machinery	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5
Master Program: Optimization of Parameters and Exploitaion Regimes of Agricultural Machinery.					
2.17. Elective Courses University					
2.17.1. Cycle professional and practical training*					
1	Design regimes, processes and technology in Agroindustrion complex	2,3	270	5,0	7,5
2	Modeling of exploitation processes and machines	1	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5
2.18. Disciplines chosen by student					
2.18.1. Cycle professional and practical training*					
1	Mechanics of agricultural materials	3	90	1,7	2,0
2	Test agricultural machinery	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5
Master Program "Optimize Conveying Processes in Agriculture"					
2.19. Elective Courses University					
2.19.1. Cycle professional and practical training*					
1	Optimization of parameters and regimes of motion	2,3	270	5,0	7,5
2	Conveying processes and machines in agriculture	1	180	3,3	5,0
<i>Total chosen by university</i>			450	8,3	12,5
2.20. Disciplines chosen by student					
2.20.1. Cycle professional and practical training*					
1	Dynamics of Conveying machines	3	90	1,7	2,0
2	Tests Conveying machines	3	90	1,7	2,0
<i>Total selected by the students</i>			180	3,4	4,0
Total number of elected part			630	11,7	16,5
Practical training			522	9,6	14,5
Writing and defense of master's thesis			288	5,3	9,0
Total for specialty			3240	60,0	90,0

\* Names cycles disciplines according to requirements of industry standards for higher education, approved on 27.08.2010, EQC and EPP.

### Abstract Disciplines Curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### 1.1. Cycle of humanitarian and socio-economic training \*

**Legislation and Law in Agriculture.** Provide students with coherent account of basic problems of law and rights in agriculture at objective, ideologically unbiased contemporary vision of modern science, synthesis of knowledge gained in professional and humanities disciplines to create holistic worldview methodological foundations and humanitarian components of Master.

**Business Foreign Language.** Acquiring knowledge and skills that will provide the necessary communicative capacity for masters in area of professional communication.

**Pedagogy.** Develop students' scientific knowledge of pedagogy as science, its aims and objectives, main teaching categories, ability to form organization of educational and pedagogical work in higher education for further implementation of future professionals in professional activities of research, teaching and administrative functions.

**Economics of technological systems.** Is to explore the relationship in middle of process systems, acquiring skills of planning, pricing and investment, to determine effectiveness of operation.

### *1.2. Cycle professional and practical training \**

**Theory and Methods of Research.** Raising comprehensive theoretical and practical level of future Masters of Engineering researchers by mastering the basics of theoretical knowledge and practical skills of the general concept of experimental methods.

**Mechatronic Systems Technology.** Teaching theoretical foundations and principles of mechatronic systems of agricultural machines. Theoretical bases of mechatronic systems, methods for its control and automatic means of mechatronic systems for agriculture machines.

**Design of Technical Process.** Teaching students with guidelines for agriculture in engineering, including design process of modern technology in agriculture. Provide justification for analysis and design of technological requirements for components and assemblies agricultural machinery.

**Design of means and facilities services.** Provide scientific principles and train future engineers (professional degree) to design and engineering technological system. Patterns of changes in repair and service work on size of service area and program as technological enterprise system.

**Logistics of Agricultural Mechanization.** Raising comprehensive theoretical and practical level mechanical engineer agricultural production through mastering basic theoretical principles and practical skills of logistics concepts with movement of agricultural products to consumer.

**Innovative Engineering Technologies.** Dates knowledge of legal, institutional and methodological foundations definitions of innovation and study of innovative engineering technologies in agriculture.

**Safety in Agroindustry.** Acquiring skills to develop organizational measures to prevent accidents, injuries and illness in workplace, health and safety management system in agricultural production, problem of reducing accidents and prevent injuries in agricultural enterprises, problems of electrical and fire safety in agricultural enterprises.

**Engineering Management.** Formation of professional knowledge and skills regarding management of industrial and technical resources based on disclosure of major projects in industrial and agricultural service enterprises that operate in market.

## **2. ELECTIVE ACADEMIC DISCIPLINES**

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle professional and practical training*

##### *Production oriented disciplines*

#### **Master program "Technology and Techniques in Planting"**

**Engineering and design of process plant systems.** Provide scientific principles and train future engineers (professional degree) to design and calculate crop technology system.

---

**Management of machines in plant.** Receive future professionals in agricultural mechanization required knowledge of advanced mechanized production lines and processes of crop production.

*2.2. Disciplines chosen by student*

*2.2.1. Cycle professional and practical training \**

**Safety crop production processes.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills for process safety crop.

**Ecological safety of plant processes.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills on environmental safety processes and crop environment in terms of resource saving nature.

*2.3. Disciplines chosen by University*

*2.3.1. Cycle professional and practical training \**

**Master program “Technology and Techniques in Livestock”**

**Engineering and design of technologic process in livestock.** Formation of professional knowledge of students on general and specific issues of managing large technical systems as an example of operation of machines and equipment for livestock logistics system.

**Management of machines in livestock.** Receive future professionals in agricultural mechanization required knowledge of advanced mechanized production lines and processes of livestock production.

*2.4. Disciplines chosen by student*

*2.4.1. Cycle professional and practical training \**

**Safety livestock production processes.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills for process safety livestock.

**Environmental safety processes livestock.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills on environmental safety processes livestock and environment in terms of resource saving nature.

*2.5. Disciplines chosen by University*

*2.5.1. Cycle professional and practical training \**

**Master program “Technology and Techniques of Processing AgroIndustries”**

**Engineering and design of technological systems processing industries.** Formation of professional knowledge of students on general and specific issues of managing large technical systems as an example of operation of machines and equipment processing facilities, logistics systems.

**Management systems, machines in processing industries.** To provide students with theoretical and practical knowledge that will help them to efficiently address issues of effective management systems in machinery manufacturing industry to improve product quality, reduce its cost, increase productivity, increase profits and improve culture and organization of production.

---

*2.6. Disciplines chosen by student*

*2.6.1. Cycle professional and practical training \**

**Process safety processing industries.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills for process safety processing industries.

**Environmental safety processes processing agroindustries.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills on environmental safety of technological processes of production and processing environment in resource-saving nature.

*2.7. Disciplines chosen by University*

*2.7.1. Cycle professional and practical training \**

**Master program “Technology and Equipment of Service Enterprises”**

**Engineering and design of technological process of service enterprises.** Formation of professional knowledge of students on general and specific issues of managing large technical systems as example of operation of machines and equipment service companies, logistics systems.

**Systems management service enterprises.** Provide scientific principles and train future engineers (professional degree) machinery design processes as road transport infrastructure, laws and peculiarities of its organization, requirements for technical service and its products, quality service and technical means to support them.

*2.8. Disciplines chosen by student*

*2.8.1. Cycle professional and practical training \**

**Process safety in service enterprises.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills for process safety service businesses.

**Environmental safety processes in service enterprises.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills on environmental safety processes and environmental service businesses in a resource-saving nature.

*2.9. Disciplines chosen by University*

*2.9.1. Cycle professional and practical training \**

**Master program “Technology and Techniques in Biological Systems”**

**Biotechnological processes and equipment manufactures.** Raising comprehensive theoretical and practical engineering level of future engineers and researchers through the assimilation of foundations of theoretical knowledge and practical skills for processes and apparatus biotech industries.

**Technology bioenergetic conversion.** Receive future professionals in field of agricultural mechanization necessary knowledge systems and technologies bioenergetic conversion.

*2.10. Disciplines chosen by student*

*2.10.1. Cycle professional and practical training \**

**Process safety Biosystems.** Raising a comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills for process safety Biosystems.

---

**Environmental safety processes Biosystems.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering the basics of theoretical knowledge and practical skills on environmental safety of technological processes of biological systems and environment in resource-saving nature.

*2.11. Disciplines chosen by University*

*2.11.1. Cycle professional and practical training\**

**Master program “Safety Principles of AgroBioEngineering”**

**Organization of labor AgroBioEngineering.** Receive future professionals in field of agricultural mechanization necessary knowledge of safety agrobioengineering.

**Theory AgroBioEngineering Safety.** Receive future professionals in the field of agricultural mechanization necessary knowledge theory of security agrobioengineering.

*2.12. Disciplines chosen by student*

*2.12.1. Cycle professional and practical training \**

**Process safety AgroBioEngineering.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills for process safety agrobioengineering.

**Environmental safety processes in AgroBioEngineering.** Raising comprehensive theoretical and practical engineering level of future mechanical engineers by mastering basics of theoretical knowledge and practical skills on environmental safety processes agrobioengineering and environment in resource-saving nature.

*2.13. Disciplines chosen by University*

*2.13.1. Cycle professional and practical training\**

**Research oriented master program**

**Master program “Mechatronic Systems and Technology of AgroIndustrial Complex”**

**Designing mechatronic systems.** Gaining knowledge and skills that are aimed at creating and designing mechatronic systems mechanization of agriculture, and their subsystems, links and systems of mechanization.

**Basics of Mechatronics.** Gaining knowledge and skills that are aimed at creating and using basic properties of mechatronic systems mechanization of agriculture, and their subsystems, links and systems of mechanization.

*2.14. Disciplines chosen by student*

*2.14.1. Cycle professional and practical training \**

**Computer control of mechatronic systems.** Gaining knowledge and skills that are aimed at creating and using computer control mechatronic systems, mechanization of agriculture.

**Mechatronic systems for agriculture.** Gaining knowledge and skills that are aimed at innovative use of mechatronic systems for agriculture.

*2.15. Elective Courses University*

*2.15.1. Cycle professional and practical training \**

**Master program “Technical Service of Machinery and Equipment”**

**Designing service processes.** Formation of professional knowledge and skills to organization of production and management of technical resources on basis of disclosure in industrial projects, agricultural service businesses that operate in market conditions,

aggregate of technological, technical and organizational factors on their performance, enabling the development of resource-cooperative production and service systems, because they play significant role in preparing Masters.

**Planning and organization of technical services enterprise.** Increased application (production) educational theoretical and practical professional development of future masters research engineers by their knowledge of modern methods of service design process.

*2.16. Disciplines chosen by student*

*2.16.1. Cycle professional and practical training \**

**Diagnostic and prediction of technical condition of machines.** Scientific research and applied engineering fundamentals to maintain or restore ability of employers to effectively use technology as well as technological discipline in order to obtain planned outcomes in specific production conditions and areas of Ukraine.

**Test agricultural machinery.** Raising comprehensive theoretical and practical research level of future Masters by mastering the basics of theoretical knowledge and practical skills of general concept testing of agricultural machinery.

*2.17. Elective Courses University*

*2.17.1. Cycle professional and practical training \**

**Master program “Optimization of Parameters and Exploitation Regimes of Agricultural Machinery”**

**Design regimes, processes and technology in agroindustrial complex.** Formation of professional knowledge of students on general and specific issues of managing large technical systems as example design modes, processes and technology of agriculture.

**Modeling of exploitation processes and machines.** Formation of professional knowledge about models and modeling processes and machines, types of models and main stages of modeling, theoretical and practical methodological foundations, methods, and objects subject modeling of technological processes of production, economic-mathematical models and modeling processes using agricultural personal computer.

*2.18. Disciplines chosen by student*

*2.18.1. Cycle professional and practical training \**

**Mechanics of agricultural materials.** Study of Mechanical and technological properties of agricultural materials as basis for effective use and improvement of agricultural machines in its application of innovative projects.

**Test agricultural machinery.** Raising comprehensive theoretical and practical research level of future Masters by mastering basics of theoretical knowledge and practical skills of general concept testing of agricultural machinery.

*2.19. Elective Courses University*

*2.19.1. Cycle professional and practical training \**

**Master program “Optimize Conveying Processes in Agriculture”**

**Optimization of parameters and regimes of motion.** Formation of professional knowledge of students on general and specific issues of managing large technical systems on example of design and optimization of parameters and modes of motion handling machines agriculture.

---

**Conveying processes and machines in agriculture.** Formation of professional knowledge of students on general and specific issues of exploitation and use of innovative materials handling processes and machines in agriculture.

*2.20. Disciplines chosen by student*

*2.20.1. Cycle professional and practical training \**

**Dynamics of conveying machines.** Study and study the dynamics of handling machines, as mechanization of agricultural production, methods of analysis and design.

**Test conveying machines.** Raising comprehensive theoretical and practical research level of future Masters by mastering basics of theoretical knowledge and practical skills of general concept of test handling machines.



**EDUCATIONAL AND RESEARCH INSTITUTE OF ENERGY AND AUTOMATIZATION**

**Director** – of the Institute – Doctor of technical sciences, professor  
Volodymyr V. Kozyrskyi  
**Phone:** (044) 527-85-80  
**E-mail:** nni.elektrik@gmail.com  
**Location:** building № 8, r. 16

**FACULTY OF ENERGETICS AND AUTOMATION**

**Dean** – of the faculty – Candidate of technical sciences, associate professor  
Ivan P. Radko  
**Phone:** (044) 527-87-81, 527-87-31, **fax:** (044) 2584151,  
**E-mail:** electrify\_dean@twin.nauu.kiev.ua  
**Location:** building № 8, r. 11

**Faculty organizes training of masters in the field:**

**8.05020201 “Automated Control of Technological Processes”**

**Issue Department:**

**Department of automatics and robotic systems named after acad.I.I.**

**Martynenko**

**Phone:** (044) 527-82-82

**E-mail:** Lysenko@nauu.kiev.ua

**Head of Department** – Ph.D., Professor Vitaliy P. Lysenko

**8.05070103 “Electrotechnical Systems of Power Consumption”**

**Issue department:**

**Electrical supply**

**Tel:** (044) 527-87-29

**E-mail:** nni.elektrik@gmail.com

**Head of Department** – Doctor of technical sciences, professor Volodymyr V. Kozyrskyi.

**8.10010101 “Energetics of Agricultural Production”**

**Issue department:**

**Electrical supply**

**Tel:** (044) 527-87-29

**E-mail:** nni.elektrik@gmail.com

**Head of Department** – Doctor of technical sciences, professor Volodymyr V. Kozyrskyi.

**Electric machinery and electric technologies**

**Phone:** (044) 527-87-84

**E-mail:** azhilt@mail.ru

**Head of department** – Doctor of technical sciences, professor Andrei Zhylytsov

**Department of automatics and robotic systems named after acad.I.I.**

**Martynenko**

**Phone:** (044) 527-82-82

**E-mail:** Lysenko@nauu.kiev.ua

**Head of Department** – Ph.D., Professor Vitaliy P. Lysenko

**Thermal Power**

---



**Phone: (044) 527-87-48**

**E-mail:gorobetsv@ukr.net**

**Head of department – Ph. D. of technical sciences, professor Valeryi H. Gorobets**

**8.05070103 “*Electrification and Automation of Agriculture*”**

**Issue department:**

**Electric machinery and electric technologies**

**Phone: (044) 527-87-84**

**E-mail: azhilt@mail.ru**

**Head of department – Doctor of technical sciences, professor Andrei V. Zhyltsov**

**Department of automatics and robotic systems named after acad.I.I.**

**Martynenko**

**Phone: (044) 527-82-82**

**E-mail:Lysenko@nauu.kiev.ua**

**Head of department – Ph.D., Professor Vitaliy P. Lysenko**

**Electric drives and power technologies**

**Phone: (044) 527-85-22**

**E-mail:lchervinky@gmail.com**

**Head of department – Ph. D. of technical sciences, professor, Leonid S.**

**Chervinskyi**

---

**Master Training**  
**in specialty “AUTOMATED CONTROL OF TECHNOLOGICAL PROCESS”**  
**Branch of knowledge – “Automation and Control”**

**Form of training, licensed number of students:**

– full-time 35

– correspondence 35

**Term of study** 1.5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian, English

**Qualification of graduates** researcher of computer systems and automation

**The concept of training**

Educational activities while ensuring the fulfillment of state orders and other agreements with entities or individuals for training in higher education in accordance with the state standards of higher education. Courses at the Department of Energy and Automation based on a systems approach between objective and principles of teaching to foster students' broadmindedness non-standard thinking, the ability to solve overhead and socio-economic problems in their relationship, and according to the needs of modern production and conditions the labor market.

An integral part of the educational activity is educative process that involves education of future professionals in the best traditions of national and world culture based on common priorities, Recovery and development of the national economy, culture, science and spiritual unity of the nation and the people of Ukraine.

**Production oriented master program**

***Master program “Computer Integrated process control systems of livestock breeding production”***

Research, development and implementation of computer integrated control systems into animal husbandry. Technology and mathematical modeling of processes in cattle, automated process control systems in livestock.

**Sphere of graduates employment**

Engineer in CEA of or poultry, engineer of CAM breeding complex, engineer in maintenance of automation systems for enterprise.

***Master program “Computer Integrated process control systems of crop growing production”***

Research, development and implementation of computer-integrated control systems management in crop production. Technology and mathematical modeling of processes into, automated process control systems for crop growing.

**Sphere of graduates employment**

Engineer in CEA for greenhouses, engineer in CAM for greenhouses, engineer to maintain automatic systems for enterprise.

***The Master program “Computer-integrated systems of technological processes of recycling and storage of agricultural products”***

## MASTER DEGREE PROGRAMS

Research, development and implementation of computer integrated control systems in to farms for the production and primary processing of agricultural products. Technology and mathematical modelling of processes on farms for the production and primary processing of agricultural products, automated process control systems in farms for the production and primary processing of agricultural products.

### **Sphere of graduates employment**

Engineer in automated control systems for production and management of primary processing of milk, engineer on maintenance of automation systems for enterprise. Engineer of automated control systems, of automation and computer-integrated technologies, of maintenance of automation systems for enterprise.

### **Research oriented master program**

#### ***Master program “Energy efficient management of biotechnical objects”***

Research and development of advanced energy management systems biotechnical objects. Technology and mathematical modeling of processes in the fields of agriculture, automated process control systems in the field of agriculture.

### **Sphere of graduates employment**

Engineer in automated systems for rural services, research engineer research institutions, scientific assistant of research institutions.

### **Practical training**

Practical training is carried out in the teaching and research farms of the University: NDH "Velykosnitynske" station beef cattle "Vorzel" ahrostantsiya "Customs", forest stadium station "Bojarka" poultry "Ukraine", "Kyyivska" Havrylivski greenhouse Complex "Pusha Vodytsya" PAT "Kyyivsilelektro" PAT "Kyyivelektromontazh", areas of electrical networks Kyiv, Cherkasy, Zhytomyr and Chernihiv companies "Oblenergo", JSC "Combine" Teplychnyi.

### **Proposed Topics for Master Theses**

1. The use of fuzzy logic in computer-aided thermal management for poultry houses with keeping hens in winter
2. Neural Networks in Hong bound control temperature and relative humidity in the greenhouse
3. Intelligent management of microclimate in the chamber for growing mushrooms and research CAP compost temperature
4. Intelligent system to microclimate in the vegetable store and research of CAP humidity
5. The use of fuzzy logic in computer-aided thermal management in a greenhouse
6. Neural Networks in hong bound control temperature in the poultry house including CO<sub>2</sub>
7. Intelligent thermal management in the poultry house using optimal control algorithm
8. The use of fuzzy logic in computer-aided thermal management greenhouses in the winter, taking into account external influences

### **Academic rights of applicants for a master program**

In addition to the specialty "Automated Control of Technological Processes" applicants with a bachelor's degree trending in "Automation and Computer Integrated

---

**MASTER DEGREE PROGRAMS**

Technologies" can continue studying the field of **knowledge 1801 "Specific categories"**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “Automated Control of Technological Process”**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	EETS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
1.1. Cycle of humanitarian, social and economic training*					
1	Philosophy	1	108,0	2,0	3,0
2	Civil protection	3	54,0	1,0	1,5
3	Business foreign language	1	108,0	2,0	3,0
4	Calculations of cost-effectiveness of investigations	3	54,0	1,0	1,5
<i>The total number of cycles</i>			324	6,0	9,0
1.2. Cycle of professional and practical training *					
1	Automated accounting of energy and material resources	1	108	2,0	3,0
2	Computer simulation control system in agriculture	2	162	3,0	4,5
3	Automation of technological processes	1	162	3,0	4,5
4	Installation, commissioning and operation of automation systems	1	162	3,0	4,5
5	Occupational health in the field	2	108	2,0	3,0
6	Special sections of mathematics	1	108	2,0	3,0
7	Technology research	2	108	2,0	3,0
8	Fundamentals of engineering	2	108	2,0	3,0
9	CAD automation in agriculture	2	108	2,0	3,0
10	CAM in agriculture	2	108	2,0	3,0
<i>The total number of cycles</i>			1242	23,0	34,5
The total number of normative part			1566	29,0	43,5
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2. 1.1. Cycle of humanitarian, social and economic training*					
1	Agricultural, land and environmental law	1	72	1,3	2,0
2	World agriculture and food resources	1	72	1,3	2,0
3	International standardization and certification technologies, raw materials and finished products	1	72	1,3	2,0
4	Strategy of sustainable development of nature and society	1	72	1,3	2,0
<i>The total number of cycles</i>			288	5	8
2.2 Cycle of professional and practical training *					
1	Object-oriented programming	3	90	1,7	2,5
2	Informative Technology	3	90	1,7	2,5
<i>The total number of cycles</i>			180	3,4	5,0
Production oriented disciplines					
Master's program: “Computer-integrated process control systems of livestock production”					
1	Typical technological objects and processes in animal husbandry	2	162	3,0	4,5
2	Modeling of biotechnical objects in livestock	2	108	2,0	3,0
<i>The total number of cycles</i>			270	5,0	7,5

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	EETS
<b>Master's program "Computer-integrated process control systems of crop production"</b>					
1	Typical technological objects and processes in plant	2	162	3,0	4,5
2	Modeling of biotechnical objects in crop	2	108	2,0	3,0
<i>The total number of cycles</i>			270	5,0	7,5
<b>Master's program "Computer-integrated process control systems processing and storage of agricultural products"</b>					
1	Typical technological objects and processes in the processing and storage of agricultural products	2	162	3,0	4,5
2	Modeling of biotechnical objects	2	108	2,0	3,0
<i>The total number of cycles</i>			270	5,0	7,5
<b>Research oriented disciplines</b>					
<b>Master program "Energy efficient management biotechnical objects"</b>					
1	Modeling of biotechnical objects	2	162	3,0	4,5
2	Typical technological objects and processes in the fields of agriculture	2	108	2,0	3,0
<i>The total number of cycles</i>			270	5,0	7,5
<i>Total at the choice University</i>			738	13,6	20,5
<b>2.2. Disciplines chosen by students</b>					
<b>2.2.1. Cycle of professional and practical training *</b>					
<b>Production oriented disciplines</b>					
<b>Masters programmes: "Computer-integrated process control systems of livestock production", "Computer-integrated process control systems of crop production", "Computer-integrated process control systems processing and storage of agricultural products"</b>					
1	Methods and tools of modern automated process control	3	90	1,7	2,5
2	Robotic systems and systems in agriculture	3	72	1,3	2,0
3	Energy efficient technologies in biotechnical facilities management	3	72	1,3	2,0
<b>Discipline at the choice</b>					
1	Systems and technologies of management database	3	126	2,3	3,5
2	Computer-integrated control system	3	126	2,3	3,5
3	Optimum Automation	3	126	2,3	3,5
<i>Total for student's choice</i>			360	6,6	10,0
<b>Discipline at the choice</b>					
<b>Master program "Energy efficient management biotechnical objects"</b>					
1	Identification of automation	3	90	1,7	2,5
2	Operations research	3	72	1,3	2,0
3	Robotic systems and systems in agriculture	3	72	1,3	2,0
<b>Discipline at the choice</b>					
4	Computational Intelligence Systems	3	126	2,3	3,5
5	Neuro Information Systems	3	126	2,3	3,5
<i>The total number of cycles</i>			360,0	6,7	10,0
<i>Just a sample</i>			1098,0	20,3	30,5
<i>Practical training</i>			360,0	6,7	10
<i>State certification</i>			216,0	4,0	6,0
<i>Together</i>			3240,0	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. Cycle of humanitarian, social and economic training\*

**Philosophy of Science.** Science and reality. The role of theory in understanding phenomena in nature and society. The relationship of theoretical and practical knowledge. Logical-mathematical and theoretical methods of processing the experimental results.

**Business foreign language.** Prepare students for professional communication orally and in writing in a foreign language.

**Calculations of cost-effectiveness of scientific development.** Methods of preparation of estimates for the construction of rural energy. Methods of payment value technical products. Methods of assessing the cost-effectiveness of engineering solutions.

**Civil protection.** Theoretical foundations of civil Protection and security in production and life. Prevention of disasters and the organization to eliminate their negative effects.

#### 1.2. Cycle of professional and practical training \*

**Automated accounting of energy and material resources.** Energy consumption and energy production. Methods for calculating specific rates of energy expenditure and materialoresursiv. Devices and systems of energy accounting and materialoresursiv. Computer systems for collecting and processing at information on the cost of energy and resources.

**Computer modeling control systems in agriculture.** Methods of computer-modeling systems (KMSU). Structure and function KMSU. Collection and processing of information. Mathematical Modelling. Algorithms for optimal and adaptive control. Implementation of control functions. Examples of KMSU in agriculture.

**Automation of technological.** Characteristics processes as facilities management and disturbances. Principles of automatic control systems. Automation of technological processes in crop growing and animal husbandry.

**Installation, commissioning and operation of automation systems.** Installation of electrical circuits automation. Handling equipment automation systems. Adjustment of sensors, controllers, actuators automatic control systems. The procedure of putting into operation mounted systems. Formation and Organization of instrumentation and automation products for the agricultural business.

**Labor protection in the industry.** Safety measures in normal and emergency modes of electrical installations. Safety in the installation, repair and maintenance of electrical installations. Lightning agricultural facilities.

**Special sections of Higher Mathematics.** Key sections of higher mathematics needed for research and development in agriculture/Electrotechnology. Mathematical methods for solving of linear and nonlinear differential equations. Matrix, operating methods. Functional series. Fundamentals of the theory of random functions.

**Technology of investigation.** Dialectics of creativity in research, organization and planning research. Methods of finding new scientific and technical solutions. Methods of theoretical studies. Introduction to the theory of optimal solutions. Methods of experimental research methods and their development. Implementation of research results.

**Fundamentals of engineering.** Engineers role in agricultural production. Types of engineering. Responsibilities engineer depending on activity and post. Labor laws. Workplace engineer automation of technological processes of agricultural production. Types and content of engineering documentation. Inventive Activity engineer. Ecological and environmental engineering problems. Prospects for the development of computer technology and engineering in agriculture.

**CAD automation APC.** Basic concepts and definitions. The basic concept of the system of electrification and automation of technological processes. Introduction to agricultural

processes. Technical support for CAD. CAD software. Databases CAD. Statistics and dynamics of process control objects. Regulatory impact and organs. Automation of technological devices.

**DCS in agriculture.** Principles of DCS. Feeds and their characteristics. Identification of facilities management. Control algorithm. Means of control system. Reliability and cost effectiveness of DCS.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of humanitarian, social and economic training\*

**Agricultural, land and environmental law.** Regulation of certain types of agricultural enterprises, their legal environment and Contracts agricultural business management, regulation of land use. Providing skills to use existing agricultural, land and environmental legislation to expand their legal horizons. Agricultural, land and environmental relationship and their regulation. Legal protection and use of natural resources.

**International standardization and certification technologies, raw materials and finished goods.** Subject of discipline is the process of training future specialists are systematized and generalized knowledge of international certification and standardization of technology, raw materials and finished products. Learning the basic principles of international and regional organizations for standardization and certification of agricultural products (ISO, FAO, Codex Alimentarius, CEN, etc.), their structures and services, duties and rights, fundamental provisions of international and European legislation in the field of standardization and certification.

**International standardization and certification of technologies, raw materials and finished products.** The subject of discipline is the process training of future experts systematized and generalized knowledge of international certification and standardization of technology, raw materials and finished products. Study of the basic principles of international and regional organizations activities for standardization and certification of agricultural products (ISO, FAO, Codex Alimentarius, CEN, etc.), their structures and services, duties and rights, fundamental provisions of international and European legislation in the field of standardization and certification.

**Strategy of sustainable development of nature and society.** The current state of world agriculture, the global market of agricultural products. International agricultural organizations and their role in shaping the trends and indicators of development market of food resources. Ukraine's place in global agriculture.

#### 2.1.2. Cycle of professional and practical training \*

**Object-oriented programming.** Basic concepts and models: object, class, data, methods, access, inheritance of properties. System objects and classes. Design of object-oriented programs: methods and algorithms. Object-oriented languages, classification, architecture, expressive means, the technology application. Interface: rules for the organization, methods and programming tools. Object-oriented systems: methods, languages and ways of programming.

**Information Technology.** Computer technology of visualization of modes and parameters of technological objects and processes. Application packages for processing and transmitting information. Means of information technology. A global network Internet.

---

**Master programs “Computer Integrated systems of technological processes of livestock production”, “Computer Integrated systems of technological processes of crop production”, “Computer Integrated systems of technological processes recycling and storage of agricultural products”**

**Typical technological objects and processes in animal husbandry.** Objects automation, classification, structure and basic properties of standard technological objects, technologies and processes livestock. Physico-chemical basis of hydrodynamic, thermal, mass transfer, mechanical and chemical processes. Calculation of heat and mass transfer processes. Technology livestock production. Fundamentals of modelling and design of technological devices.

**Typical technological objects and processes in crop production.** Automation object, classification, structure and basic properties of standard technological objects, technologies and plant processes. Physical and chemical basis of hydrodynamic, thermal, mass transfer, mechanical and chemical processes. Calculation of heat and mass transfer processes. Technologies crop production. Fundamentals of modeling and design of technological devices.

**Typical technological objects and processes in the fields of agriculture.** Objects automation, classification, structure and basic properties of standard technological objects, technologies and processes agricultural sectors. Physical and chemical basis of hydrodynamic, thermal, mass transfer, mechanical and chemical processes. Calculation of heat and mass transfer processes in the fields of agricultural technology processing and storage of agricultural products. Fundamentals of modeling and design of technological devices.

**Modelling of biotechnical objects in the fields of agriculture.** Analytical methods for modeling processes. Methods of identification processes. Examples of typical modeling processes. Checking the adequacy of mathematical models of technological processes.

**Modelling of biotechnical objects in livestock.** Analytical methods for modeling processes in animal husbandry. Methods of identification processes in animal husbandry. Examples of typical modeling processes. Checking the adequacy of mathematical models of technological processes in animal husbandry.

**The Master program “Energy efficient control systems of biotechnical objects”**

**Modelling of biotechnical objects in crop production.** Analytical methods for modelling processes in crop production. Methods of identification processes in crop production. Examples of typical modelling processes. Checking the adequacy of mathematical models of technological processes in crop production.

**Modelling of biotechnical objects in the processing and storage of agricultural products.** Analytical methods for modelling of technological processes of processing and storage of agricultural products. Methods for identification of processes of processing and storage of agricultural products. Examples of typical modeling processes. Checking the adequacy of mathematical models of technological process of processing and storage of agricultural products.

---



*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training \**  
*Production oriented disciplines*

**Masters: “Computer-integrated process control systems of livestock production”, “Computer-integrated process control systems of crop production”, “Computer-integrated process control systems processing and storage of agricultural products”**

**Methods and tools of modern automated control.** Simulation of technical and biological objects under uncertainty: Kharkov random processes. Statistical modeling of random processes. Decision making under uncertainty using gaming techniques. Creating and working with databases. Software. Terms of intelligent systems.

**Robotic systems and systems in agriculture.** Problems of design and modelling principles, control algorithms robotic systems into systems. Purpose, classification and problems of robot control systems. Structure, the basic components of robotic control systems. Intelligent robotic systems. The system of perception and recognition of information. Knowledge management system, problem solving and formation control actions. The system of environmental impact. Principles of robots and robotic systems. System design, manufacturing, robotics control systems. Applications of robots and robotic systems in the agriculture.

**Energy efficient technologies in biotech facilities management.** Study of the current status and prospects of energy-efficient technologies in agriculture, the general characteristics of energy efficient technologies in biotech facilities management, as well as standard solutions for the application of energy efficient technologies. Methods for determining the technical and economic characteristics of energy-efficient manufacturing processes. Typical decisions on the use of energy efficient technologies in biotechnical facilities management.

**Systems and technology database Management.** Database design. Implementation of database structure in the environment database. Implementation of phase information in the database. Development of front-end applications. Developing applications for the database. Data protection Managing transactions.

**Computer-integrated control system.** Principles of DCS. Feeds and their characteristics. Identification of facilities management. Control algorithm. Means of control system. Reliability and cost effectiveness of DCS.

**Optimal automatic control.** Optimal control Problem. Task Criteria for optimization of agricultural production. Methods of optimal control theory. Calculus of variations, Pontryagin maximum principle, dynamic programming. Analytical design of optimal controllers. Optimal control for random perturbations. The synthesis of stochastic systems. Optimal observer

*Research oriented disciplines*

**Master program “Energy efficient management of biotechnical objects”**

**Identification of automation.** Classification of technological processes and productions as objects of automatic object control. The methods of constructing static and dynamic objects agricultural processes and industries.

**Research operations.** Basic theory of optimization. Types of optimization problems. Methods for unconstrained optimization. Comparison of methods. Methods of multivariate search. Gradient methods. Symleks method. Nelder-Mead method. Methods mediocre optimization. The method of stationary points. The method of Lagrange multipliers. Linear, integer and dynamic programming. The standard form of linear optimization models. Network model. Model of dynamic programming. Probabilistic model.

---

Random (stochastic) processes. Markov processes. Game theory and decision making. Decision-making process. Practical application of queuing theory.

**Robotic systems and systems in agriculture.** Problems of design and modelling principles, control algorithms complexes and robotic systems. Purpose, classification and problems of robot control systems. Structure, the basic components of robotic control systems. Intelligent robotic systems. The system of perception and recognition of information. Knowledge management system, problem solving and formation control actions. The system of environmental impact. Principles of robots and robotic systems. System design, manufacturing, robotics control systems. Applications robots and robotic systems in the agriculture.

**Computational Intelligence Systems.** Exploring the theoretical foundations of the systems calculated intelligence that will allow to specialized programming environments to synthesize appropriate models of technological processes (objects) using them to design and implement efficient algorithms for their control. Features of intelligent manufacturing systems with respect to specific volume facilities, installations and equipment mechanization and electrification of production processes.

**Neuro informative systems.** Basic concepts of neural networks. Properties of neural networks learning process. Hopfield neural networks, Hamming. Basic concepts of fuzzy logic. Fuzzy sets and fuzzy neural network.

---

**Master Training**  
**in specialty “ELECTRICAL POWER SYSTEM”**  
**Branch of knowledge “Electrotechnical Systems of Power Consumption”**

**Form of training, licensed number of students:**

– full-time	20
<b>Term of study</b>	<b>1,5 years</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian</b>
<b>Qualification of graduates</b>	<b>Master of supply system power</b>

**The concept of training**

Educational activities are conducted according to state higher education providence orders with the conditions of contracts with entities or individuals for training in higher education.. Courses at the Department of Energy and Automation based on a systems approach between objective and principles of teaching to foster students' broadmindedness non-standard thinking, the ability to solve overhead and socio-economic problems in their interrelation, and according to the needs of modern production and conditions labor market.

An integral part of the educational activity is educative process that involves education of future professionals in the best traditions of national and world culture based on human priorities, the program of revival and development of the national economy, culture, science and spiritual unity of the nation and the people of Ukraine.

**Production oriented master program**

***Master program: “Electric networks and system”***

Research, development and implementation of energy efficient technologies, electrical networks and systems. Power plants, modeling and design of power supply in agriculture. Modeling and automation and security devices remotely power supply systems.

**Sphere of graduates employment**

Production, distribution and use of electricity, electrical works, repair and maintenance of power lines, transformer substations and electricity equipment.

**Research oriented master program**

***Master program: “Electric stations, systems and networks”***

Design, installation, commissioning and operation of power lines, transformer substations and switchgear. Accounting and management of electrical energy. Power plants, modeling and design of power supply in agriculture. Modelling, automation and security devices remotely power supply systems.

**Sphere of graduates employment**

Engineer-researcher of the research institutions, researcher at the research institutions. Engineer of operation of electrical networks and systems.

**Practical training**

Practical training is carried out in the teaching and research farms of the University: Scientific Research Farm “Velykosnitynske” station of beef cattle “Vorzel” agro station of

---

**MASTER DEGREE PROGRAMS**

“Mytnytsya” forest research station “Bojarka” poultry “Ukraine1”, “Kyyivska”, “Havrylivski” greenhouse “Pushcha Vodytsya” PAT “Kyyivsidelektro” PAT “Kyyivelektromontazh” in the areas of electrical networks Kyiv, of Cherkasy, Zhytomyr and Chernihiv companies “Oblenergo”.

**Proposed Topics for Master Theses**

1. Optimization of parameters and modes of electric network operation;
2. The influence of autonomous power supply on the quality and reliability of power supply agricultural enterprises;
3. Automated system of registration and regulation of energy resources expenditure and energy carriers.
4. Energy supply for livestock due to from renewable energy sources.

**Academic rights of applicants for a master program**

Applicants with a bachelor's degree with a specialty “Electrical and Electric” in addition to specialty “electrical power system” can continue studying the field of **knowledge 1801 "Specific categories":**

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Electrotechnical Systems of Power Consumption”**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	EETS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
1.1. Cycle of humanitarian, social and economic training*					
1	Intellectual Property	1	36	0,7	1,0
2	Occupational health in the field (Electrical)	1	144	2,7	4,0
3	Energy forecasting and planning	2	36	0,7	1,0
4	Philosophy of science and innovation development	1	54	1,0	1,5
5	Business foreign language	1	54	1,0	1,5
<i>The total number of cycles</i>			324,0	6,0	9,0
1.2. Cycle of natural science (fundamental) training*					
1	Information and computer systems in the energy sector	2	72	1,3	2,0
2	Fundamentals of Patent and Copyright	1	72	1,3	2,0
3	Power control and experimental methods of electric modes	2	72	1,3	2,0
4	Progressive methods of energy conservation and development of power supply systems	2	72	1,3	2,0
<i>The total number of cycles</i>			288,0	5,3	8,0
1.3. Cycle of professional and practical training *					
1	Energy-saving electric mode	2	180	3,3	5,0
2	Typical electric	2	108	2,0	3,0
3	ACS telemetry and power supply systems	2	180	3,3	5,0
4	Electricity industry	1	180	3,3	5,0
<i>The total number of cycles</i>			648,0	12,0	18,0
However, the statutory part			1260,0	23,3	35,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	EETS
<b>2.1.1 Cycle professional and practical training</b>					
1	Agricultural, land and environmental law	1	36	0,7	1,0
2	International standardization, certification, technology, raw materials and finished products	1	36	0,7	1,0
3	Strategy of development of nature and society	1	36	0,7	1,0
4	Energy Management and Energy Audit	3	144	2,7	4,0
5	Mathematical models of optimization problems in power	2	180	3,3	5,0
6	Relay protection and automation of electric distribution networks	3	180	3,3	5,0
7	Automated control and management of power consumption	3	180	3,3	5,0
<i>The total number of cycles</i>			792	15,0	22,0
<b>2.2. Disciplines chosen by students</b>					
<b>2.2.1 Cycle professional and practical training</b>					
Production oriented disciplines					
Master program "Electrical Networks and Systems"					
1	Energy efficiency in industrial processes and plants	3	216	4,0	6,0
2	Design of power consumption	3	180	3,3	5,0
3	Technology Operation and repair of electrical systems of power plants	3	180	3,3	5,0
<i>The total number of cycles</i>			576	11,0	16,0
Research oriented disciplines					
Master's program: "Electric stations, systems and networks"					
1	Mathematical and simulation in electrical networks and systems	3	144	2,7	4,0
2	Small power from renewable energy sources	3	144	2,7	4,0
3	Grid-systems and artificial intelligence in power	3	144	2,7	4,0
4	Electromechanical transients in electrical systems	3	144	2,7	4,0
<i>The total number of cycles</i>			576,0	10,7	16,0
Total selective			1368	25,0	38,0
Practical training			432,0	8,0	12,0
State certification			180,0	3,3	5,0
Total			3240,0	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. Cycle of humanitarian, social and economic training\*

**Intellectual property.** Intellectual property and its role in scientific and technological progress of development. Comparative characteristic and feature of intellectual property with other property. Legislation regulating and protection of intellectual property.

**Labor Protection (Electric safety Devices).** Protective measures during normal and emergency operation of electrical installations. Safety in the installation, repair and maintenance of electrical installations. Lightning agricultural facilities.

**Forecasting and planning of energy.** Principles and methods of forecasting. Planning, organization and management of the power plants and energy management industry. The main directions of tariffs in the market. Systems planning and preventive maintenance of equipment.

**Philosophy of science and innovation development.** Ideological and methodological training of students, formation of philosophical culture as a theoretical basis for university-level training. Coverage of philosophical knowledge of the basic parts of philosophy that would develop the type of consciousness students. The philosophical image of science. Philosophical problems of modern science.

**Foreign Language.** Mastering the knowledge, skills and abilities. What is needed to provide students communicative ability in the areas of professional communication. It comes from the fact that reading, translation, speaking and writing are both aim and learning tool.

#### 1.2 Cycle of professional and practical training\*

**Energy-saving electric mode.** The main factors of energy savings in industry. General questions determining the economic effectiveness of capital investments in the energy sector. Fundamentals of electricity rationing. Main areas of energy savings of various industries. Power saving modes in power systems industry.

**Typical electric.** Typical installations of general purpose and features of their structure and kinematics. Technological cycles and electrical equipment. Typical control circuit Automatic Electric installations. Calculations of electric power.

**ACS telemetry and power supply systems.** Theory Telemechanics signaling communication channels. Methods to improve noise immunity signals. Principles of telecontrol systems, signaling, metering. Characteristics of modern Telemechanics, automatic supervisory control of power networks and power supply ACS industrial enterprises.

**Electricity industry.** External electrical network, substations and rural back-up power. Equipment for power stations and substations. Relay protection and automation. Reliability of power supply. Quality of electricity.

#### 1.3 Cycle of natural science (fundamental) training\*

**Information and computer systems in the power industry.** Information management systems and systems. Concept of automated accounting systems of electricity in the energy market of Ukraine. Structures and features of the construction and use of existing information management systems and systems for electricity metering.

**Basics of patents and copyright.** International classification and systematization of patenting. The legal framework for copyright protection, and especially its use. Preparation of applications for registration of a patent.

**Power control methods and electrical mode control power consumption.** Energy balance. Rationing of fuel and energy resources. Control systems energy costs. Energy-saving measures.

**Progressive trends of energy saving and the development of electricity.** Electrical and basic measures for energy efficiency in the industrial enterprise. Calculation of electricity industry. Energy resources and ways to address effectively the problems of energy conservation. Energy-saving technologies, perspectives and effective ways of using alternative and renewable energy sources. Plans and designs systems.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2. 1.1. Cycle of humanitarian, social and economic training\*

**Agricultural, land and environmental law.** Regulation of certain types of agricultural enterprises, their legal environment and Contracts agricultural business management, regulation of land use. Providing skills to use existing agricultural, land and environmental legislation to expand their horizons legal. Agricultural, land and environmental relationship and their regulation. Legal protection and use of natural resources.

**International standardization and certification technologies, raw materials and finished goods.** Subject of discipline is the process of training future specialists are systematized and generalized knowledge of international certification and standardization of technology, raw materials and finished products. Learning the basic principles of international and regional organizations for standardization and certification of agricultural products (ISO, FAO, Codex Alimentarius, CEN, etc.), their structures and services, duties and rights, fundamental provisions of international and European legislation in the field of standardization and certification.

**Strategy of sustainable development of nature and society.** The current state of world agriculture, the global market for agricultural products. International agricultural organizations and their role in shaping the trends and indicators of market food resources. Ukraine's place in global agriculture.

**Energy Management and Energy Audit.** Basic principles of energy auditing and energy management. Conduct in energy of audit company. Technology of power management.

**Mathematical models of optimization problems in electro-supply.** Fundamentals of linear and nonlinear mathematical programming. Mathematical models. Transportation problems. Based on dynamic programming. Optimization models.

**Relay protection and automation of electrical distribution networks.** Theory and practice of automatic control modes of power supply systems using modern methods and means of automation and relaying.

**Automated control system power consumption.** Information management systems power supply. Tools to remotely control power supply systems. Telecontrol systems, telemeasuring and signaling. Channels of communication in systems automation and remote control. Dispatch equipment control points. Means in automation control systems power supply. Techno-economic performance automation and Telemechanization.

2.2. *Disciplines chosen by students*  
2.1.2 *Cycle professional and practical training*

*Production oriented disciplines*

**Master's program: "Electrical Networks and Systems"**

**Energy efficiency in industrial processes and plants.** Energy resources, ways to efficient solution of the problems of energy efficiency in agriculture. Energy-saving technologies, perspectives and effective ways of using alternative and renewable energy systems, heat and water. Plans and designs systems.

**Design of electricity.** Production specification, calculation, creation and delivery of graphic documents using CAD firm Autodesk Inc. and subsystems CAD Mathcad, Autocad and optimal computer – integrated technologies. Method and system design electricity energy farming. Requirements for the project.

**Technology of maintenance and repair of power supply systems.** Operation of transformer substations, switchgear, power lines, motors, lighting and oprominyvalnyh settings, electrically heated and electric equipment, communications equipment. The procedure of putting into operation of mounted systems. Formation and Organization of test equipment and means of automation. Operation of boilers, heat generators and heaters. Operation of electrical equipment. Research specialization

*Research oriented disciplines*

**Master's program: "Electric stations, systems and networks"**

**Mathematical modeling and simulation of electrical networks and systems.** Definitions of energy networks. Modeling the network and their analysis. Requirements for the performance of networks and how they support. Criteria for parameter optimization of networks. How to optimize your network settings. Analysis of modes of energy networks. Criteria for optimization of networks. Optimization of the components of the cost of electricity.

**Small plants with renewable energy sources.** Types of small plants. Features of small plants and their role in power APC. Comparison of small sources of electricity. The construction of small power plants.

**Grid systems and artificial intelligence in power.** Intelligent Systems. Tool environment of intelligent systems. Technological means of intelligent systems. Subsystems automation programming tools and intelligent agents. Predictive programming. Automation Programming Environment – TURBO. Systems EXSYS, GURU – ART. Hardware implementation of intelligent systems, electronic components. Examples of artificial intelligence.

**Transients in power systems.** Ensure proper functioning of sustainable electricity for any infringements of modes. Transients in Synchronous generators stations and network power systems. Electromechanical transients in electrical systems for small and large perturbations.



**Master Training in specialty “ENERGETICS OF AGRICULTURAL PRODUCTION”  
Branch of knowledge “Engineering and Energetics of Agricultural Production”**

<b>Learning, licensed volume:</b>	
– full-time	<b>100</b>
– correspondence	<b>75</b>
<b>Apprenticeship</b>	<b>1,5 years</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of instruction</b>	<b>Ukrainian</b>
<b>Qualifying graduates</b>	<b>research engineer with in energetics for agriculture</b>

**The concept of training**

Educational activities while ensuring the fulfillment of state orders and other agreements with entities or individuals for training in higher education in accordance with the state standards of higher education. Courses at the Department of Energetic and Automation are based on a systems approach and interdisciplinary learning principles to foster students' broadmindedness non-standard thinking, ability to solve overhead and socio-economic problems in their relationship, and according to the needs of modern production and market labor.

An integral part of the educational activity is educative process that involves education of future professionals in the best traditions of national and world culture taking into account the common priorities Recovery and development of the national economy, culture, science and spiritual unity of the nation and the people of Ukraine.

**Production oriented master program**

***Master's program “Electrical Networks and Systems”***

Research, development and implementation of energy efficient technologies, electrical networks and systems. Power plants, modeling and design of power APC. Modeling of automation and security devices and remotely power supply systems.

**Sphere of graduates employment**

Production, distribution and use of electricity, electrical work, repair and maintenance of transmission lines, transformer substations and power distribution.

**Master's program “Computer-integrated process control systems in the fields of agriculture”**

Research, development and implementation of computer integrated management systems on farms for the production and primary processing of agricultural products. Technology and mathematical modeling of processes in the fields of agriculture, automated process control systems in the fields of agriculture.

**Scope of employment of graduates**

Engineer in CEA of poultry factory, an engineer in automated control systems for greenhouses engineer in CAM, engineer, engineer in maintenance of automation systems in the enterprise.

***Master's program “Automation of technological processes and computer integrated systems to control information and technological resources, agriculture”***

Research, development and implementation of computer-integrated systems management information and technological resources of agriculture technology and

mathematical modeling of technology informative technological resources for agriculture, automated management information and technological resources for agriculture.

**Sphere of graduates employment**

Engineer in automated control systems, engineer in automation and computer-integrated technologies, engineer in maintenance of automation systems for enterprise.

***Master's program "Energy engineering"***

The integrated performance of the design, installation, adjustment, commissioning and maintenance of electrical current equipment. Reliability of technical systems and the quality of energy and energy resources. Technology energy engineering and operational reliability of electrical equipment.

**Sphere of graduates employment**

Repair and maintenance of transmission lines, transformer substations and power distribution. Installation works. Project work.

***Master's program "Power Supply for agriculture"***

Installation and operation of power plants in agriculture, development and implementation of alternative and renewable energy sources. Thermal power plants and systems, alternative and renewable energy for agriculture. Energy, energy, energy sources and heating technologies.

**Sphere of graduates employment**

Electricity production from renewable sources. Production and distribution of heat. Collection, purification and distribution of water.

**Research oriented master program**

***Master's program "Electrical Networks and Systems"***

Design, installation, commissioning and operation of transmission lines, transformer substations and switchgear. Accounting and management of electrical energy. Power plants, modeling and design of power APC. Modeling and automation of security devices and power supply systems.

**Sphere of graduates employment**

Engineer-researcher of research institutions, scientific assistant of research institutions. Engineer of electrical networks and systems.

***Master program "Energy Efficient management of biotechnical objects"***

Research and development of advanced energy management systems of biotechnical objects. Technology and mathematical modeling of processes in the fields of agriculture, automated process of control systems in the field of agriculture.

**Sphere of graduates employment**

Engineer in automated systems of management services, research engineer research institutions, scientific assistant research institutions.

***Master Program "Scientific and technical principles of electromechanical energy conversion"***

Studying ways to convert electrical energy, to develop new motors with improved performance characteristics. Basic principles of research and the modern theory of

---

electromechanical energy conversion. Technology research of electromagnetic devices and electromechanical energy converters.

### **Sphere of graduates employment**

Engineer-researcher of research institutions, scientist of research and design institutes.

### ***Master's program "Electricity for agriculture"***

Research and development of new power plants in agriculture. Research, development and implementation of alternative and renewable energy sources for agriculture. Nanotechnology of intensification of heat and mass transfer, alternative and renewable energy in agriculture. Complete integrated power system.

### **Practical training**

Engineer-researcher of research institutions, scientific assistant of research institutions. Practical training is carried out in the teaching and research farm of the University: NDH "Velykosnitynske", station beef cattle "Vorzel", forest studying station "Bojarka" poultry "Ukraine", "Kyivska", "Havrylivsk", greenhouse "Pusha Vodytsya", PAT "Kyivselektro" PAT "Kyivelektromontazh" areas of electrical networks Kyiv, Cherkasy, Zhytomyr and Chernihiv companies "Oblenergo".

### **Proposed Topics for Master Theses**

1. Optimization parameters and modes of operation of power grid;
2. The influence of autonomous power supply into the quality and reliability of power supply agricultural enterprises;
3. Automated registration and regulation of energy expenditure and energy.
4. Energy livestock farms from renewable energy sources.
- 5 Draft Energy Services farm
- 6 System power management of agricultural enterprises
- 7 Computer-Integrated CAP packaging of dairy products
- 8 Intelligent automated control system TP
- 9 Automatic control system based on TS neuro in for mative networks
10. Complex using traditional and alternative energy sources

### **Academic rights of applicants for a master program**

Applicants with a bachelor's degree with a specialty "Power and electrical systems in agriculture" can continue studying in the field of **knowledge "Energy technology of agricultural production"**

•8.100010103 – Electrification and automation of agriculture (see p. 254) field of knowledge 1801 "Specific categories":

specialties in the **branch of knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
  - 8.18010021 – "Pedagogy of Higher School"(see p. 434);
  - 8.18010018 – Administrative management (see p. 397);
  - 8.18010020 – "Educational Institution Management" (see p. 427).
-

**MASTER DEGREE PROGRAMS**

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “Energetics of Agricultural Production”**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
1.1. Cycle of humanitarian, social and economic training*					
1	Philosophy of science and innovation development	1	54	1,0	2,0
2	Foreign Language	1	54	1,0	2,0
<i>The total number of cycles</i>			108	2,0	3,0
1.2 Cycle of professional and practical training					
1	Electricity agriculture	2	108	2,0	3,0
2	Design of electrification, automation and energy	1	108	2,0	3,0
3	AIC heat and water supply	1	108	2,0	3,0
4	Electrical technologies in agriculture	2	108	2,0	3,0
5	Technology maintenance and repair of power equipment and automation	1	108	2,0	3,0
6	Safety in industry (Electrical)	2	108	2,0	3,0
7	Software for Master's programs	2	108	2,0	3,0
8	Information Technology	2	72	1,33	2,0
9	Management staff	1	72	1,33	2,0
10	Electric production machines and mechanisms	1	108	2,00	3,0
11	Energy efficiency and renewable energy	2	72	1,33	2,0
12	Technology Research	2	72	1,33	2,0
<i>The total number of cycles</i>			1152	21,3	32,0
<b>Total</b>			<b>1260</b>	<b>23,3</b>	<b>35,0</b>
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2. 1.1. Cycle of humanitarian, social and economic training*					
1	Agricultural, land and environmental law	1	36	0,67	1,0
2	International standardization and certification technologies, raw materials and finished products	1	36	0,67	1,0
3	Civil protection	2	72	1,33	2,0
<i>The total number of cycles</i>			144	2,67	4,0
2.1.1. Cycle of professional and practical training					
Production oriented disciplines					
Master's program “Computer-integrated process control systems in the fields of agriculture”					
1	Information technology in control systems	2	108	2,0	3,0
2	Computer-aided management	2	108	2,0	3,0
3	Engineering-service automation systems	3	108	2,0	3,0
4	Economic calculations in engineering activities	3	72	1,3	2,0
5	Typical technological objects and processes in the fields of agriculture	3	144	2,7	4,0
6	Modeling of biotechnical objects in the field of agriculture	3	144	2,7	4,0
<i>The total number of cycles</i>			684	13,0	19,0
Master's program “Process of automation and computer integrated management information and resources tehnolhichnymy agriculture”					
1	Information technology in control systems	2	108	2,0	3,0
2	Computer-aided management	2	108	2,0	3,0
3	Engineering-service automation systems	3	108	2,0	3,0
4	Economic calculations in engineering activities	3	72	1,3	2,0
5	Typical technological objects and processes in agriculture	3	144	2,7	4,0
6	Simulation of information technology systems	3	144	2,7	4,0
<i>The total number of cycles</i>			684,0	12,7	19
Master's program “Energy Engineering in Agriculture”					
1	Technical service of power equipment	2	180	3,3	5,0
2	Energy audit and management in agriculture	3	180	3,3	5,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	ECTS
3	Engineering psychology	3	144	2,7	4,0
4	Reliability of technical systems, technological risks	3	180	3,3	5,0
<i>The total number of cycles</i>			684	13,0	19,0
<b>Master's program "Electrical Networks and Systems"</b>					
1	Electrical Networks and Systems	2	180	3,3	5,0
2	Design of power supply in agriculture	3	180	3,3	5,0
3	Automated control and management of power consumption	3	144	2,7	4,0
4	Transients in power systems	3	180	3,3	5,0
<i>The total number of cycles</i>			684	13	19,0
<b>Master's program "Energy supply in agriculture"</b>					
1	Thermal power plant and system	2	180	3,3	5,0
2	Accounting and control the distribution and expenditure of energy	3	180	3,3	5,0
3	Alternative and renewable energy sources in agriculture	3	144	2,7	4,0
4	Energy equipment energy efficiency of agricultural production	3	180	3,3	5,0
<i>The total number of cycles</i>			684	13,0	19,0
Research specialization					
<b>Master program "Energy Efficient management biotechnical objects"</b>					
1	Information technology in control systems	2	108	2,0	3,0
2	Typical technological objects and processes	2	144	2,7	4,0
3	Modeling of biotechnical objects	3	144	2,7	4,0
4	Computer simulation control system in agriculture	3	108	2,0	3,0
6	Neural Networks	3	108	2,0	3,0
5	Calculations of cost-effectiveness research developments	3	72	1,3	2,0
<i>The total number of cycles</i>			684	12,7	19,0
<b>Master Program "Scientific and technical principles of electromechanical energy conversion"</b>					
1	Modern scientific problems in the field of energy	2	180	3,3	5,0
2	Energy audit and management in agriculture	3	180	3,3	5,0
3	Patent engineering experiment and theory	3	144	2,7	4,0
4	The modern theory of electromechanical energy conversion	3	180	3,3	5,0
<i>The total number of cycles</i>			684	13,0	19,0
<b>Master's program "Electrical Networks and Systems"</b>					
1	Transients in power systems	2	180	3,3	5,0
2	The economic-efficiency energy systems in agriculture	2	180	3,3	5,0
3	Reliability of supply	3	144	2,7	4,0
4	AIC criterion problem of power supply	3	180	3,3	5,0
<i>The total number of cycles</i>			684	13,0	19,0
<b>Master's program "Energy supply in agriculture"</b>					
1	Accounting and control of energy resources and energy	2	180	3,3	5,0
2	The economic-efficiency energy systems in agriculture	3	180	3,3	5,0
3	Optimization of energy systems and energy efficiency	3	144	2,7	4,0
4	Nanotechnology intensification of heat and mass transfer	3	180	3,3	5,0
<i>The total number of cycles</i>			684	13,0	19,0
Total University Chaise Discipline			828	15,0	23,0
2.2. Disciplines chosen by students					
2.2.1. Cycle professional and practical training *					
Production oriented disciplines					
Master's program "Computer-integrated process control systems in the fields of agriculture"					

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	ECTS
<b>Master's program "Computer Integrated Systems Management Information Technology Resources Agriculture"</b>					
1	Methods and means of modern computer-aided process control	3	216	4,0	6,0
2	Technical equipment, automation equipment and automated control systems	3	180	3,3	5,0
3	Microprocessor control system	3	180	3,3	5,0
4	Optimum Automation	3	180	3,3	5,0
<i>The total number of student's choice</i>			576	10,7	16,0
<b>Master's program "Enerhoizhynirynh in agriculture"</b>					
1	Energy Technology Engineering	3	216	4,00	6,0
2	The operational reliability of electrical equipment in agriculture	3	180	3,3	5,0
3	Accounting and control of energy resources and energy	3	180	3,3	5,0
4	The quality of energy and energy	3	180	3,3	5,0
5	Energy Economics	3	180	3,3	5,0
<i>The total number of student's choice</i>			576	10,7	16,0
<b>Master's program "Electrical Networks and Systems"</b>					
1	Relay protection and automation systems of power	3	216	4,0	6,0
2	Automation and Control systems of power	3	180	3,3	5,0
3	Electronics and electrical system	3	180	3,3	5,0
4	Small power plants in agriculture	3	180	3,3	5,0
<i>The total number of student's choice</i>			576	10,7	16,0
<b>Master's program "Energy supply in agriculture"</b>					
1	Energy efficiency in heating technology	3	216	4,0	6,0
2	Biofuel	3	180	3,3	5,0
3	Gas	3	180	3,3	5,0
4	Small hydro and wind power installation in agriculture	3	180	3,3	5,0
5	Heat technology in production and processing of agricultural products	3	180	3,3	5,0
<i>The total number of student's choice</i>			576	10,7	16,0
<b>Research oriented disciplines</b>					
<b>Master program "Energy Efficient management biotechnical objects"</b>					
1	Operations Research	3	216	4,0	6,0
2	Intelligent Systems	3	180	3,3	5,0
3	Neuro Information Systems	3	180	3,3	5,0
4	Adaptive systems	3	180	3,3	5,0
<i>The total number of student's choice</i>			576	10,7	16,0
<b>Master Program "Scientific and technical principles of electromechanical energy conversion"</b>					
1	Asynchronous machines and high-energy electromagnetic and electromechanical processes in compensated induction motors	3	216	4,0	6,0
2	Mathematical modeling of electromagnetic devices and electromechanical energy converters	3	180	3,3	5,0
3	Calculations of electromagnetic devices and electromechanical energy converters	3	180	3,3	5,0
4	Reliability of electromagnetic devices and electromechanical energy converters	3	180	3,3	5,0
5	Research Methods electromagnetic devices and electromechanical energy converted vachiv	3	180	3,3	5,0
6	Testing electromagnetic devices and electromechanical energy converters	3	180	3,3	5,0
<i>The total number of student's choice</i>			576	10,7	16,0
<b>Master's program "Electrical Networks and Systems"</b>					
1	Simulation and optimization of supply	3	216	4,0	6,0
2	Information management systems in grids	3	180	3,3	5,0
3	Alternative and renewable energy sources	3	180	3,3	5,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	ECTS
4	Relay protection and automation systems of power	3	180	3,3	5,0
5	Functional alloys in electrical vehicles	3	180	3,3	5,0
<i>The total number of student's choice</i>			576	10,7	16,0
<b>Master's program "Energy supply agriculture"</b>					
1	Modelling of thermal and hydrodynamic processes	3	216	4,0	6,0
2	Integrated use of alternative and renewable energy sources	3	180	3,3	5,0
3	Heat and Mass Transfer in technological processes of processing agricultural products	3	180	3,3	5,0
4	Cogeneration plants	3	180	3,3	5,0
<i>The total number of student's choice</i>			576	10,7	16,0
Just a sampling component			1404	26,0	39,0
Practical training			360	6,7	10,0
Preparation and defense of master's thesis			216	4,0	6,0
Just a sampling component			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of humanitarian, social and economic training\**

**Philosophy of science and innovation development.** Ideological and methodological training of students, formation of philosophical culture as a theoretical basis for university-level training. Coverage of philosophical knowledge of the basic parts of philosophy that would develop the type of consciousness students. The philosophical image of science. Philosophical problems of modern science.

**Foreign Language.** Mastering the knowledge, skills and abilities. Needed to provide students communicative ability in the areas of professional communication. It comes from the fact that reading, translation, speaking and writing are both aim and learning tool.

##### *1.2 Cycle of professional and practical training\**

**Electricity in agriculture.** External electric networks, substations and rural reserve power. Equipment for power stations and substations. Relay protection and automation. Reliability of power supply. Quality of electricity.

**Design of electrification, automation and power supply.** Method design of electrification, automation and energy in agriculture. Computer technologies in design. Requirements for the project.

**Heat and water supply for agriculture.** thermal power plants and district heating system. Energy audit and management. Heat and water supply efficiency in agriculture. Power supply. Facilities for the abstraction of surface and groundwater. Distribution and internal water supply networks.

**Electrical technologies in agriculture.** Electrophysical, electrochemical, electrobiological factors in nature. The use of strong electric fields. The cultivation of electric shock. Electro and technology. Magnetic processing of materials.

**Technology of maintenance and repair of power equipment and tools.** Equipment supply systems of agriculture. Operation of transformer substations, switch gear, power lines, motors, lighting and radiant settings, electrically heated and electric equipment, and communications equipment. Adjustment of sensors, controllers, actuators automatic control systems. The procedure of putting into operation mounted systems. Formation and Organization of instrumentation and automation of products for the

agricultural business. Operation of boilers, heat generators and heaters. Operation of water supply and heating systems. Operation of gas plants. Operation of electrical equipment in agriculture.

**Occupational Health in the field (Electrical).** Protective measures during normal and emergency operation of electrical installations. Safety in the installation, repair and maintenance of electrical installations. Lightning agricultural facilities.

**Software for Master programs.** Analytical methods for mathematical modeling of objects of agricultural production. Building models of typical objects experiment. The algorithms of the model on a PC. Algorithms for Euler, Runge-Kutta method.

**Personnel management.** HR management system in the organization. Analysis and quality of staff turnover. Plan of personnel. Methods of recruitment and selection, assessment of motivation and professional development.

**Information Technology.** Computer technology visualization modes and parameters of technological objects and processes. Application packages for processing and transmitting information. Means of information technology. A global network Internet.

**Technology research.** Methodological principles of research. Specificity of research activities. General methodology of scientific research. Principles of scientific information. General requirements for the design and writing of scientific papers. Master's thesis, as qualified research. General requirements and rules for registration of research. Review, preparation of scientific publications and materials for the protection of the master's work.

**Electric production machines and mechanisms.** Drivers characteristics of machines and mechanisms. Principles and electronic control circuit. Complete sets of equipment for automatic control. Experimental methods of driving characteristics.

**Energy efficiency and renewable energy.** Energy resources, ways to effectively address the problem of energy saving in agriculture. Energy-saving technologies, perspectives and effective ways of using alternative and renewable energy systems, heat and water. Plans and designs systems.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2. 1.1. Cycle of humanitarian, social and economic training\*

**Agricultural, land and environmental law.** Regulation of certain types of agricultural enterprises, their legal environment and Contracts agricultural business management, regulation of land use. Providing skills to use existing agricultural, land and environmental legislation to expand their horizons legal. Agricultural, land and environmental relationship and their regulation. Legal protection and use of natural resources.

**International standardization and certification technologies, raw materials and finished goods.** Process of training future specialists are systematized and generalized knowledge of international certification and standardization of technology, raw materials and finished products. Learning the basic principles of international and regional organizations for standardization and certification of agricultural products (ISO, FAO, Codex Alimentarius, CEN, etc.), their structures and services, duties and rights, fundamental provisions of international and European legislation in the field of standardization and certification.

**Civil protection.** Theoretical Foundations of Civil Protection and safety in production and life. Prevention of disasters and the organization eliminate their negative effects.

---



2.1.2 *Cycle of professional and practical training*  
*Production oriented disciplines*

**The Master program “Computer-integrated systems of technological processes in the fields of agriculture”**

**Informative technologies in control systems.** Computer imaging technology modes and parameters of technological objects and processes. Application packages for processing and transmitting information. Means of information technology. A global network Internet.

**Computer-aided management in the field.** Principles of DCS. Feeds and their characteristics. Identification of facilities management. Control algorithm. Means of control system. Reliability and cost effectiveness DCS.

**Economic calculations in engineering activities.** Methods of preparation of estimates for the construction of rural energy. Methods of calculating the technical work. Methods of assessing the cost-effectiveness of engineering solutions.

**Modeling of biotechnical objects in the fields of agriculture.** Analytical methods for modeling processes. Methods of identification processes. Examples of typical modeling processes. Checking the adequacy of mathematical models of technological processes.

**Typical technological objects and processes in the field of agriculture.** Automation object, classification, structure and basic characteristics of typical technological facilities, technologies and processes agricultural sectors. Physico-chemical basis of hydrodynamic, thermal, mass transfer, mechanical and chemical processes. Calculation of heat and mass transfer processes in the fields of agricultural technology processing and storage of agricultural products. Fundamentals of modeling and design of technological devices.

**Master program “Automation of technological processes and computer integrated management systems of information technology resources for agriculture”**

**Simulation of information technology systems.** Methods of constructing mathematical models. Construction of mathematical models of equipment elektrotehnopchno analytical method and the results of the experiment. Analysis and optimization models.

**Technical service of power equipment in agriculture, maintenance of transformer substations and transmission lines.** Servicing of electrical consumers. Diagnosing electrical equipment.

**Energy audit and management in agriculture.** Basic principles of energy auditing and energy management. Conduct an energy audit company. Technology power management.

**Engineering Psychology.** Psychology section, which examines the interaction between humans and technical devices. The main tasks of engineering psychology is the study of the processes of receiving, processing and storage man who carried out the design of technical devices and their management. Study of the structure of the operator, its physiological and psychological aspects. Engineering psychological projection. Psychological support scientific organization of labor. Professional recruitment and training of personnel.

**Reliability of technical systems and technological risks.** Key categories and standards in reliability. Categories reliability of electricity supply. Quality of electricity. Technical risks in the energy sector. Environmental aspects of electrification of agriculture.

**Electrical Networks and Systems.** Electrical part substations and power reserve. Protecting rural electrical surge. Improving cost efficiency and reliability of power supply in agriculture. Automation and control systems telemechanization supply.

---

**Master program “Energy engineering for agriculture”**

**Automated control and management of power consumption.** Modern principles, methods and tools for monitoring and managing power consumption as an important direction of energy saving and energy saving in agriculture.

**Transients in power systems.** Ensure proper functioning of sustainable electricity for any infringements of modes. Transients in Synchronous generators stations and network power systems. Electromechanical transients in electrical systems for small and large perturbations.

**Thermal power plant and systems.** Sources of heat. Combustion of fossil fuels. Boiler systems. Heat. With heaters. Heating systems. Thermal network. Gas agriculture. Alternative sources of supply for agricultural production.

**Accounting and control power consumption and energy.** Basic principles of metrological support of energy conservation. Counters and systems of electric energy. Counters and accounting system and control water loss, heat and gas.

**Master program “Electrical networks and systems”**

**Alternative and renewable energy sources in agriculture.** Schematics and design features of heating using heat thermal and nuclear power plants, gas compressor stations of gas mains. Method of heat exchangers for heat recovery ventilation air livestock buildings. Theoretical Foundations of cogeneration (a joint production of heat and electricity). Scheme of CHP based on gas turbines, internal combustion engines.

**Energy equipment of energy efficiency of agricultural production.** The principles of state policy in the field of energy efficiency. The criteria for energy efficiency of heat and mass processes. Ekserho-economic optimization of heat generating and heat recovery equipment of agroindustrial production. Energy efficiency in livestock production. Energy in thermal processes of processing and storage of agricultural products.

**Energy audit and management in agriculture.** Range of services for the preparation and provision of installation and operation of power equipment in agriculture. Energoservice in agriculture: nomenclature and implementation services. Marketing Energoservice.

**Information technology in control systems.** Computer imaging technology modes and parameters of technological objects and processes. Application packages for processing and transmitting information. Means of information technology.

**Master program “Energy software for agriculture”**

**Modelling of biotechnical objects.** Analytical methods for modeling processes. Methods of identification processes. Examples of typical modeling processes. Checking the adequacy of mathematical models of technological processes

**Engineering activities in the service of automation systems.** Formation and Organization of instrumentation and automation products for the agricultural business. Network power equipment aftermarket. Groups of activities of after-sales service. Care System as part of the image of the company – the manufacturer.

**Optimization of energy systems and energy efficiency.** Energy resources, ways to effectively address the problem of energy saving in agriculture. Energy-saving technologies, perspectives and effective ways of using alternative and renewable energy systems, heat and water. Loss of energy transfer. Technical measures to reduce energy loss. Arrangements for reducing energy losses.

**Criterion task Electricity.** Energy Options networks. Modeling the network and their analysis. Requirements for the performance of networks and how they support. Criteria for parameter optimization of networks. How to optimize your network settings. Analysis of modes of energy networks. Criteria for optimization of networks. Optimization of the components of the cost of electricity.

---

**Reliability of power supply systems.** Main categories and standards in reliability. Categories reliability of electricity supply. Quality of electricity. Technical risks in the energy sector. Environmental aspects of electrification of agriculture.

**Economic efficiency of energy systems in agriculture.** Methods of preparation of estimates for the construction of rural energy. Methods of payment value technical products. Methods of assessing the cost-effectiveness of engineering solutions. The scope of services for the preparation and provision of installation and operation of power equipment in agriculture. Energoservice in agriculture: nomenclature and implementation services. Marketing Energoservice.

**Relay protection and automation systems of power.** Theory and practice of automatic control modes of power supply systems using modern methods and means of automation and relaying.

### **Master program “Energy software for agriculture”**

**Automation and Control power supply system’s.** Information management systems power supply. Tools to remotely control power supply systems. Telecontrol systems, telemeasuring and signaling. Channels of communication in systems automation and remote control. Dispatch equipment of control points. Means in automation control systems power supply. Techno-economic performance of automation and telemechanization.

**Electronics and electrical system.** Electrical substations and part of the reserve power. Protecting rural electrical surge. Increased efficiency and reliability of power supply in agriculture. Automation and control systems telemechanization supply.

**Small plants in agriculture.** Types of small plants. Features of small plants and their role in the power supply agriculture. Comparison of small sources of electricity. The construction of small power plants.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle for professional and practical training\**

#### *Production oriented disciplines*

**Master's program “Computer-integrated process control systems in the fields of agriculture”, Master's Program “Computer Integrated Systems of Informative Technologies management for agriculture”**

**Methods and tools of modern automated control of technological processes in agriculture.** Characteristics processes as facilities management and disturbances. Principles of automatic control systems. Automation of technological processes in crop and livestock production. Principles of DCS. Feeds and their characteristics. Indentyfikatsiya facilities management. Control algorithm. Means of control system. Reliability and cost effectiveness DCS.

**Optimal automatic control.** Optimal Control Problem. Criteria for optimization of agricultural production. Methods of optimal control theory. Calculus of variations, Pontryagin maximum principle, dynamic programming. Analytical design of optimal controllers. Optimal control for random perturbations. The synthesis of stochastic systems. Optimal observer.

**Technical equipment, automation equipment and automated management Principles of DCS.** Feeds and their characteristics. Indentyfikatsiya facilities management. Control algorithm. Means of control system. Reliability and cost effectiveness DCS.

**Microprocessor of control system.** Architecture of microprocessor and microcomputer, microprocessor programming in assembler, microprocessor hardware system. Developing and debugging microprocessor systems in agricultural production.

---

Discrete signals, their coding. DAC and ADC. The analysis in the time and frequency domains. Handling and sposterezhuvanist. Synthesis of digital systems. Limitations in microprocessor control systems.

**Master's program “Energy engineering for agriculture”**

**Energy Technology Engineering.** Engineering as a separate sphere of activity. Nomenclature of engineering services. Engineering – Consulting firm. Engineer – Resident in engineering activities. Service as a means of creating a system of relations between the company and client. Network power equipment aftermarket. Groups of activities of after-sales service. Care System as part of the image of the company – the manufacturer.

**The operational reliability of electrical equipment in the agricultural sector.** Accounting and inventory of its power. Definition of technical, planning maintenance and repair of power equipment. The calculation of complexity of maintenance and repair needs for personnel, materials, components and spare parts. Net aftermarket electrical equipment. Preventive maintenance and repair. System maintenance. Organization of service. Preventive maintenance and repair. Organization of service. Net after-sales service and repair. Group of activities after sales service.

**Accounting and control power consumption and energy.** Devices of keeping active and reactive power. Reactive power controller. Multiple records electricity. Controllers coolant flow. Counters of water and gas.

**Economics of Energy.** Methods of preparation of estimates for the construction of rural energy. Methods of payment value technical products. Methods of assessing the cost-effectiveness of engineering solutions.

**The quality of energy and energy.** State standards for the quality of energy and energy resources. European standards for quality of energy and energy resources. Instrument for measuring of software quality of energy.

**Master's program “Energy supply in agriculture”**

**Energy efficiency in teplotehnohivah.** Sources of heat and electricity. Loss of energy transfer. Losses in transformers. Losses in transmission lines. Technical measures to reduce energy loss. Arrangements for reducing energy losses.

**Gas supply for agriculture.** Basic characteristics of gas as an energy source. Devices of gas charges. Switchgears. Consumers.

**Biofuels.** Resources of biofuels in agricultural production. Solid biofuels. Equipment for the preparation and use of solid biofuels. Liquid biofuels. Equipment for the production of bioethanol and biodiesel. Biogas. Technologies and equipment for the production of biogas. Gasification of solid biofuels. Environmental safety production and use of biofuels.

**Small hydropower and wind power institutions.** Trends energy of small rivers and wind and hydro turbines in wind power plants, especially the designs of existing hydro and wind turbines, the theoretical foundations of the workflow and select their parameters.

**Heat technology in production and processing of agricultural sources of heat.** Combustion of fossil fuels. Boiler systems. Heat. Water heaters. Heating systems. Thermal network. Gas agriculture. Alternative sources of power for agricultural production.

*Research oriented disciplines*

**Master's program “Efficient energy system to control biotechnical object”**

**Simulation and optimization of power.** Analytical methods for modeling processes electricity. Methods of identification processes. Examples of typical modeling processes. Checking the adequacy of mathematical models of technological processes of electricity. Characteristics of processes as objects of management and disturbances. Principles of automatic control systems. Automation of technological processes in crop and livestock production.

---

**Alternative and Renewable Energy.** Types of alternative and renewable energy sources. Features of small plants and their role in power agriculture. Comparison of alternative and renewable energy. The construction of small power plants

**Relay protection and automation systems of power.** Theory and practice of automatic control modes of power supply systems using modern methods and means of automation and relaying

**Information management systems in grids.** Information management systems power supply. Tools to systems control power supply systems. Telecontrol, telemeasuring and signaling. Channels of communication in systems automation and remote control. Dispatch equipment control points. Means in automation control systems power supply. Techno-economic performance automation and Telemechanization.

### **Master's program “Energy supply in agriculture”**

**Heat and Mass Transfer in the process of agricultural production.** Differential equations of heat and mass transfer. Triple analogy. Heat and Mass Transfer in multi-medium. Heat and mass transfer in livestock and poultry facilities. Heat and Mass Transfer in the dryer. Heat and mass transfer in the processes of thermal processing of agricultural products.

**Cogeneration plants.** Methods for biogas from agricultural waste. The design and thermal calculation of methane tanks. Structures of active heliosystems. Calculating the surface area heating. Options circuits solar heating and hot water.

**Modelling of thermal and hydrodynamic processes.** Analytical methods for modeling processes electricity. Methods of identification processes. Examples of typical modeling processes. Checking the adequacy of mathematical models of technological processes of electricity. Characteristics of processes as objects of management and disturbances. Principles of automatic control systems. Automation of technological processes in crop and livestock production.

**Modelling of thermal and hydrodynamic processes.** Analytical methods for modeling processes of electricity. Methods of identification processes. Examples of typical modeling processes. Checking the adequacy of mathematical models of technological processes of electricity. Characteristics of processes as objects of management and disturbances. Principles of automatic control systems. Automation of technological processes in crop and livestock production.

### **Master Program “Scientific and technical principles of electromechanical energy conversion”**

**Mathematical modelling of electromagnetic devices and electromechanical energy converters.** Induction machine as a universal electromechanical energy converter. Mathematical model of the electrical machine. The calculation of transients in electric car. Calculation of steady symmetric and asymmetric modes  $m$  - phase electrical machine.

**Calculations of electromagnetic devices and electromechanical energy converters.** Methods of mathematical modeling of electrical machines. Simulation of thermal, electromagnetic and electromechanical processes in the devices.

**Reliability of electromagnetic devices and electromechanical energy converters.** Methods for determining the reliability of electrical equipment. The operational reliability of various types of electrical equipment. Energy Electron – ion technology in agriculture. Thermoelectric converters and Heat accumulation installation. Electrolysis, electroosmosis, magnetic water treatment, ultrasound diagnosis and electro.

**Asynchronous machines and high-energy electromagnetic and electromechanical processes in compensated induction motors.** Induction machine as a universal electromechanical energy converter. Mathematical model of the electrical

---

machine. The calculation of transients in electric car. The operational reliability of asynchronous machine.

**Testing electromagnetic devices and electromechanical energy converters.**

Control methods to operate of electrical equipment. The instrument of test measurements and testing of electrical equipment. Modeling emergency modes. Algorithms for troubleshooting wares.

**Research methods electromagnetic devices and electromechanical energy converters-methodology research.** Principles of scientific information. General requirements for the design and writing of scientific papers. Methods for controlling electrical output characteristics. Test Measurement and testing of electrical equipment. Simulation modes of electrical equipment.

**Master program “Energy Efficient management of biotechnical objects”**

**Fundamentals of operations research optimization theory.** Types of optimization problems. Methods for unconstrained optimization. Comparison of methods. Methods of multivariate search. Gradient methods. Symleks method. Nelder-Mead method. Methods mediocre optimization. The method of stationary points. The method of Lagrange multipliers. Linear, integer and dynamic programming. The standard form of linear optimization models. Network model. Model of dynamic programming. Probabilistic model. Random (stochastic) processes. Markov processes. Game theory and decision making. Decision-making process. Practical application of queuing theory.

**Intelligent systems.** Theoretical principles of operation of calculated intelligence. Effective control algorithms. Features of intelligent manufacturing systems with respect to specific volume facilities, installations and equipment mechanization and electrification of production processes.

**Neuro information systems.** Basic concepts of neural networks. Properties of neural networks learning process. Hopfield neural networks, Hamming. Basic concepts of fuzzy logic. Fuzzy sets and fuzzy neural network.

**Adaptive system.** Classification of adaptive systems and the principles of their construction. Methods and algorithms for identification of dynamic systems. Systems of extreme regulation. Adaptive system model. Hierarchical suboptimal ACS. Algorithms for selecting options in the task of adaptive management homogeneous finite Markov chains.

---

**Master Training in specialty “ELECTRIFICATION AND AUTOMATION OF AGRICULTURE”**

**Branch of knowledge “Agricultural technology and energy production”**

**Form of training, licensed number of students:**

– full-time 70  
– correspondence 70

**Term of study** 1,5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian

**Qualification of graduates** research engineer with the electrification and automation of agriculture

**The concept of training**

Educational activities while ensuring the fulfillment of state orders and other agreements with entities or individuals for training in higher education in accordance with the state standards of higher education. Courses at the Department of Energetic and Automation are based on a systems approach and interdisciplinary learning principles to foster students' broadmindedness non-standard thinking, ability to solve overhead and socio-economic problems in their relationship, and according to the needs of modern production and market labor.

An integral part of the educational activity is educative process that involves education of future professionals in the best traditions of national and world culture taking into account the common priorities Recovery and development of the national economy, culture, science and spiritual unity of the nation and the people of Ukraine.

*Production oriented disciplines*

***Master's program “Electrified technologies and electrical equipment in animal husbandry”***

Research, development and implementation of new technologies in the electrified farms for the production and processing of agricultural products. Modeling controlled electric actuators and livestock. Design of electrical power and lighting systems and networks in livestock. Scope of employment of graduates. Electrical technologies in animal husbandry. Repair, maintenance and operation of electrical equipment in animal husbandry. Installation works. Project work.

**Sphere of graduates employment**

Electrical technologies in animal husbandry. Repair, maintenance and operation of electrical equipment in animal husbandry. Installation works. Project work.

***Master's program “Electrified technologies and electrical equipment in seed and crop growing”***

Research, development and implementation of new technologies in to the electrified farms for the production and processing of agricultural products. Simulation of variable frequency drives and actuators in seed and seedling. Design of electrical power and lighting systems and networks in the seed and seedling.

**Sphere of graduates employment**

## MASTER DEGREE PROGRAMS

Electrical technologies in animal husbandry. Repair, maintenance and operation of electrical equipment in animal husbandry. Installation works. Project work.

### ***Master's program "Computer-integrated process control systems in the fields of agriculture"***

Research, development and implementation of computer integrated management systems on farms for the production and primary processing of agricultural products. Technology and mathematical modeling of processes in the fields of agriculture, automated process control systems in the fields of agriculture.

#### **Sphere of graduates employment**

Engineer in CEA for poultry factories the automated control systems for the production and management of primary dairy processing engineer in CAM pig barn complex Engineer in CEA for greenhouses, engineer maintenance of automation systems in the enterprise.

### ***Master's program "Process of automation and computer integrated management information and technological resources, agriculture"***

Research, development and implementation of computer-integrated systems management information and technological resources for agriculture. Technology and mathematical modeling information technology resources, automated management information and technological resources for agriculture.

#### **Sphere of graduates employment**

Engineer in automated control systems engineer in automation and computer-integrated technologies, engineer in maintenance of automation systems for enterprise.

#### **Research oriented master program**

### ***Master program "Energy Efficient management of biotechnical objects"***

Research and development of advanced energy management systems of biotechnical objects. Technology and mathematical modeling of processes in the fields of agriculture, automated process control systems in the field of agriculture.

#### **Sphere of graduates employment**

Engineer in automated systems management services, research engineer for research institutions, scientific assistant for research institutions.

### ***Master's program "Electrified technology and manufacturing electrical equipment in SG"***

Study ways to improve agricultural production through the use of new electrified technologies. Simulation of variable frequency drives and actuators in the field of agriculture. Methods of processing products in the fields of agriculture

#### **Practical training**

Engineer in electrified technology, research engineer for research institutions, scientific assistant for research institutions. Practical training Practical training is carried out in the teaching and research farm of the University: NDH "Velykosnitynske", station beef cattle "Vorzel", forest studying, lisodoslidna station "Bojarka" poultry factory "Ukraine", "Kyyivska", "Havrylivski" greenhouse "Pusha Vodytsya" PAT "Kyyivsilektro" PAT "Kyyivelektromontazh" areas of electrical networks Kyiv, Cherkasy, Zhytomyr and Chernihiv companies "Oblenergo".

---



## MASTER DEGREE PROGRAMS



**Proposed Topics for Master Theses**

1. Electrification of technological processes in processing of animal products
2. Electrification of technological processes in food industry
3. Electrification of technological processes in processing of plant products
4. Automated registration and regulation of energy expenditure and energy.
5. Computer integrated SAR packaging of dairy products
6. Intelligent automated control system of TP
7. Automatic control system based on TS neuron informative networks
8. Evaluation of the quality of agricultural Production method of discharge visual electrography
9. Magnetic treatment of water and fuel feed solvent in greenhouses
10. Study of ultraviolet radiation on animals

**Academic rights of applicants for a master program**

In addition to the specialty “Power Farm applicants with a bachelor's degree with a specialty “Power and electrical systems in agriculture” can continue studying the field of knowledge “Energy Technology and agricultural production”:

- 8.100010101 – Power Farm vrobnystva (see p. 240) ;

specialties in the *branch of knowledge 1801 “Specific categories”*:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Electrification and Automation of Agriculture”**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Philosophy of science and innovation development	2	54	1,0	1,5
2	Foreign Language	2	54	1,0	1,5
<i>The total number of cycles</i>			108,0	2,0	3,0
<i>1.2 Cycle of professional and practical training*</i>					
1	Electricity agriculture	1-2	108	2,0	3,0
2	Design of electrification, automation and power farming	1	108	2,0	3,0
3	Alternative energy in agriculture	1	108	2,0	3,0
4	Electrical technologies in agriculture	2	108	2,0	3,0
5	Technology maintenance and repair of electrical equipment and automation	1	108	2,0	3,0
6	Safety in industry (Electrical)	1	108	2,0	3,0
7	Software for Master's programs	2	108	2,0	3,0
8	Information Technology	2	72	1,3	2,0
9	Computer-integrated technology in electrification and automation in agriculture	2	72	1,3	2,0
10	Electric agricultural machines, units and production lines	1	108	2,0	3,0
11	The instrument of research	1	72	1,3	2,0
12	Technology Research	2	72	1,3	2,0
<i>The total number of cycles</i>			1152,0	21,3	32,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	ECTS
<b>Total</b>			1260,0	23,3	35,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<b>2.1.1. Cycle of humanitarian, social and economic training*</b>					
1	Agricultural, land and environmental law	1	36	0,7	1,0
2	International standardization and certification technologies, raw materials and finished products	1	36	0,7	1,0
3	Civil protection	2	72	1,3	2,0
<i>The total number of cycles</i>			144	2,7	4,0
<b>2.1.1. Cycle of professional and practical training</b>					
<b>Production oriented disciplines</b>					
<b>Master's program "Computer-integrated process control systems in the fields of agriculture"</b>					
1	Information technology in control systems	2	108	2,0	3,0
2	Computer-aided management in	2	108	2,0	3,0
3	Engineering-service automation systems	3	108	2,0	3,0
4	Economic calculations in engineering activities	3	72	1,3	2,0
5	Typical technological objects and processes in the fields of agriculture	3	144	2,7	4,0
6	Modeling of biotechnical objects in the field of agriculture	3	144	2,7	4,0
<i>The total number of cycles</i>			684	13,0	19,0
<b>Master's program "Process of automation and computer integrated management information and resources for agriculture"</b>					
1	Information technology in control systems	2	108	2,0	3,0
2	Computer-aided management	2	108	2,0	3,0
3	Engineering-service automation systems	3	108	2,0	3,0
4	Economic calculations in engineering activities	3	72	1,3	2,0
5	Typical technological objects and processes in agriculture	3	144	2,7	4,0
6	Simulation of information technology systems	3	144	2,7	4,0
<i>The total number of cycles</i>			684	13,0	19,0
<b>Master's program "Eelectrified technology and electrical equipment in animal husband"</b>					
<b>Master's program "Electrified technology and electrical equipment in seed and crop graving"</b>					
1	Wiring the actuators in automated plants	2	180	3,33	5,0
2	Simulation of variable frequency drives, machines and production lines	3	180	3,33	5,0
3	Electrotechnology processing of agricultural products	3	180	3,33	5,0
4	Engineering activities for maintenance of electrical power systems	3	144	2,67	4,0
<i>The total number of cycles</i>			684	13,0	19,0
<b>Research specialization</b>					
<b>Masters program "Energy Efficient management biotechnical objects"</b>					
1	Informative technology in control systems	2	108	2,00	3,0
2	Typical technological objects and processes	2	144	2,7	4,0
3	Modeling of biotechnical objects	3	144	2,7	4,0
4	Computer simulation control system in agriculture	3	108	2,0	3,0
5	Calculations of cost-effectiveness research developments	3	72	1,3	2,0
6	Neural Networks	3	108	2,0	3,0
<i>The total number of cycles</i>			684	13,0	19,0
<b>Master's program "electrified technology and electrical equipment in agriculture"</b>					
1	Electro-methods and processing of agricultural products	2	252	4,7	7,0
2	Mathematical modeling of technological processes in agriculture	3	216	4,0	6,0
3	Methods and means of monitoring the	3	216	4,0	6,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			Hours	Credits	
				National	ECTS
	effectiveness of electrical processing of agricultural products				
<i>The total number of cycles</i>			684	13,0	19,0
Total at University's Chaise			828	15,0	23,0
2.2. Disciplines chosen by students					
Production oriented disciplines					
Master's program "Computer-integrated process control systems in the fields of agriculture", Master's Program "Process automation and computer integrated management of information and technological resources of agriculture"					
1	Methods and means of modern computer-aided process control	3	216	4	6,0
2	Technical equipment, automation equipment and automated control systems	3	180	3,3	5,0
3	Microprocessor control system	3	180	3,3	5,0
4	Optimum automation	3	180	3,3	5,0
<i>The total number of student's choice</i>			576,0	10,7	16,0
Master's program "Electrified technology and electrical equipment in livestock"					
1	Design of electrical power and networks	3	216	4,0	6,0
2	Electromagnetic processing of agricultural products	3	180	3,3	5,0
3	Design of lighting systems and networks	3	180	3,3	5,0
4	Electro Optical Technology	3	180	3,3	5,0
<i>The total number of student's choice</i>			576,0	10,7	16,0
Master's program "Electrified technology and electrical equipment in seed and crop"					
1	Electromagnetic processing of agricultural products. products	3	180	3,33	5,0
2	Electron-ion technology in agriculture	3	216	4,0	6,0
3	Optical Electrotechnology	3	180	3,3	5,0
<i>The total number of student's choice</i>			576,0	10,7	16,0
Research oriented disciplines					
Master program "Energy Efficient management of biotechnical objects"					
1	Operations Research	3	216	4,0	6,0
2	Intelligent Systems	3	180	3,3	5,0
3	Neuro Information Systems	3	180	3,3	5,0
4	Adaptive systems	3	180	3,3	5,0
<i>The total number of student's choice</i>			576,0	10,7	16,0
Master's program "Electrified technology and electrical equipment in the agricultural production"					
1	Electrified technology in agriculture	3	216	4,0	6,0
2	Processing of agricultural products in the field of corona discharge	3	180	3,3	5,0
3	Electromagnetic processing of agricultural products	3	180	3,3	5,0
4	Spectrographic methods as processing of agricultural products	3	180	3,3	5,0
<i>The total number of student's choice</i>			576,0	10,7	16,0
Just a sampling component			1404,0	26,0	39,0
Practical training			360	6,7	10,0
Preparation and defense of master's thesis			216	4,0	6,0
Just a sampling component			3240,0	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### Annotations of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### 1.1. Cycle of humanitarian, social and economic training\*

**Philosophy of science and innovation development.** Ideological and methodological training of students, formation of philosophical culture as a theoretical

basis for university-level training. Coverage of philosophical knowledge of the basic parts of philosophy that would develop the type of consciousness students. The philosophical image of science. Philosophical problems of modern science.

**Foreign Language.** Mastering of the knowledge, skills and abilities. What is needed to provide students communicative ability in the areas of professional communication. It comes from the fact that reading, translation, speaking and writing are both to and learning tool.

### *1.2 Cycle professional and practical training*

**Electricity agriculture.** External electric networks, substations and rural reserve power. Equipment for power stations and substations. Relay protection and automation. Reliability of power supply. Quality of electricity.

**Design of electrification, automation and electrical agriculture.** Methods of design of electrification, automation and energy in agriculture. Computer technologies in design. Requirements for the project.

**Alternative energy in agriculture.** Schematics and design features of heating using heat thermal and nuclear power plants, gas compressor stations of gas mains. Method of heat exchangers for heat recovery ventilation air livestock buildings. Theoretical Foundations of cogeneration - a joint production of heat and electricity. Scheme of CHP made based on gas turbines, internal combustion engines and more.

**Electrical technologies in agriculture.** Electrophysical, electrochemical, electrobiological factors in nature. The use of strong electric fields. The cultivation of electric shock. Electro and technology. Magnetic processing of materials.

**Technology maintenance and repair of electrical equipment and automation.** Operation of electrical equipment in agriculture. Operation of transformer substations, switchgear, power lines, motors, lighting and oprominyuvalnyh settings, electrically heated and electric equipment, and communications equipment. Adjustment of sensors, controllers, actuators automatic control systems. The procedure of putting into operation mounted systems. Formation and organization of instrumentation and automation products for the agricultural business. Operation of boilers, heat generators and heaters. Operation of water supply and heating systems. Operation of gas plants. Operation of electrical equipment in agriculture.

**Occupational Health in the field (Electrical).** Protective measures during normal and emergency operation of electrical installations. Safety in the installation, repair and maintenance of electrical installations. Lightning for agricultural facilities.

**Software for Master programs.** Analytical methods for mathematical modeling of objects of agricultural production. Building models of typical objects for experiment. The algorithms of the model on a PC. Algorithms for Euler, Runge-Kutta method.

**Information Technology.** Computer technology visualization modes and parameters of technological objects and processes. Application packages for processing and transmitting of information. Means of information technology. A global network Internet.

**Computer-integrated technology in electrification and automation of agriculture.** Work in Windows, Word Processor Word, spreadsheet Exel, image editors, Database Management System Acces, scanning and text recognition, work in a computer network system of mathematical calculations MathCAD.

**Electric production machines and mechanisms.** Drivers characteristics of machines and mechanisms. Principles and electronic control circuit. Complete sets of equipment for automatic control. Experimental methods of driving characteristics.

**The instrument of research-support devices keeping active and reactive power.** Reactive power controller. Multiple records electricity. Controllers coolant flow.

Counters of water and gas. Devices for measuring the characteristics of agricultural products.

**Technology research.** Methodological principles of research. Specificity of research activities. General methodology of scientific research. Principles of scientific information. General requirements for the design and writing of scientific papers. Master's thesis, as qualified research. General requirements and rules for registration of research. Review, preparation of scientific publications and materials for the protection of the master's work.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1 *Cycle of humanitarian, social and economic training\**

**Agricultural, land and environmental law.** Regulation of certain types of agricultural enterprises, their legal environment and contracts for agricultural business management, regulation of land use. Providing skills to use existing agricultural, land and environmental legislation to expand their horizons legal. Agricultural, land and environmental relationship and their regulation. Legal protection and use of natural resources.

**International standardization and certification technologies, raw materials and finished goods.** Systematized and generalized knowledge of international certification and standardization of technology, raw materials and finished products. Learning the basic principles of international and regional organizations for standardization and certification of agricultural products (ISO, FAO, Codex Alimentarius, CEN, etc.), their structures and services, duties and rights, fundamental provisions of international and European legislation in the field of standardization and certification.

#### 2.1.2 *Cycle of professional and practical training*

##### *Production oriented disciplines*

### **Master program “Computer integrated control systems of technological processes in agriculture sector”**

**Information technology in control systems.** Computer imaging technology modes and parameters of technological objects and processes. Application packages for processing and transmitting of information. Means of information technology. A global network Internet.

**Computer-aided management in the field.** Principles of DCS. Feeds and their characteristics. Identification of facilities management. Control algorithm. Means of control system. Reliability and cost effectiveness of DCS.

**Engineering activities in the service of automation systems.** The procedure of putting into operation of mounted systems. Formation and Organization of instrumentation and automation products for the agricultural business. Network power equipment aftermarket. Groups of activities of after-sales service. Care system as part of the image of the company - the manufacturer.

**Economic calculations in engineering activities.** Methods of preparation of estimates for the construction of rural energy. Methods of calculating the technical work. Methods of assessing of the cost-effectiveness of engineering solutions.

**Modelling of biotechnical objects in the fields of agriculture.** Analytical methods for modelling processes. Methods of identification processes. Examples of typical modeling processes. Checking the adequacy of mathematical models of technological processes.

**Simulation of information technology systems.** Methods of constructing mathematical models. Construction of mathematical models of equipment electrotechnical analytical method and the results of the experiment. Analysis and optimization of models.

**Master programs “Electrician technologies and electrical equipment of stockbreeding” “Electrician technologies and electrical equipment of seed and crop growing”**

**Electric actuators in automated plants.** Drivers characteristics of machines and mechanisms. Principles and electronic control circuit. Complete sets of equipment for automatic control. Experimental methods of driving characteristics.

**Simulation of electric adjustments.** Options drive. Simulation parameters occasions. Requirements regarding performance and ways to support them. Criteria for parameter optimization drives. Optimization methods. Analysis modes occasions. Management modes of the drive. Technical support.

**Electrotechnological processing of agricultural products.** Processes and electro equipment in agriculture. Electrical installation with power and electrophysical processing of agricultural materials. Basic theory of strong electric fields using seed treatment considering its features. Ozonation. Treatment of electric shock. Power equipment and technology, ultrasound and magnetic material processing.

**Engineering activities for maintenance of electrical power systems.** Procedure for surrender mounted systems in operation. Engineering as a separate sphere of activity. Nomenclature of engineering services. Engineering - Consulting firm. Service as a means of creating a system of relations between the company and client. Network power equipment aftermarket. Care system as part of the image of the company - the manufacturer.

*Research oriented disciplines*

**Master program “Energy Efficient control systems of biotechnical objects”**

**Information technology in control systems.** Computer imaging technology modes and parameters of technological objects and processes. Application packages for processing and transmitting information. Means of information technology.

**Modeling of biotechnical objects.** Analytical methods for modelling processes. Methods of identification processes. Examples of typical modelling processes. Checking the adequacy of mathematical models of technological processes.

**Electro-methods and processing of agricultural products.** Processes and power equipment in agriculture. Electrical installation with power and electrophysical processing of agricultural materials. Basic theory of strong electric fields using seed treatment considering its features. Ozonation, electric shock treatment, electro engineering and technology, ultrasound and magnetic material processing.

**Mathematical modeling of technological processes in agriculture.** Analytical methods for mathematical modeling of agricultural production facilities. Methods of constructing mathematical models. Construction of mathematical models of electro-analytical method and equipment for the experiment. Analysis and optimization models.

**Methods and tools for efficiency for SH products.** Major categories and standards in reliability. The quality of agricultural products. Technical risks in the energy sector. Environmental aspects of electrification of agriculture.

**Master program “Electrified technology and electrical equipment in agriculture”**

The research **features of electro technical processes and works of electrician equipment on agriculture.** Electrical sources and installations of electrophysical processes of agriculture materials. Basic theory of using strong electric fields of seed treatment considering its features. Ozonation, electric shock treatment, electro engineering technologies ultrasound and magnetic material processing.

**Mathematic modelling of technological processes in agriculture.** Analytical methods for mathematical modelling of agricultural production facilities. Methods of

---

constructing for mathematical models. Construction of mathematical models of electro-analytical method and equipment for the experiment. Analysis and optimization models

**Simulation of information technology systems.** Methods of constructing mathematical models. Mathematic constructions of electro technical equipment by analytic method to be the results of experiment. Analysis and optimization models.

**Methods and tools for monitoring of efficiency cultivation of agricultural products.** Main categories and standards in reliability. The quality of agricultural products. Technical risks in energy sector. Environmental aspects of electrification of agriculture

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical training*

#### *Production oriented disciplines*

**Master's program "Computer-integrated process control systems in the fields of agriculture", Master's Program "Computer Integrated Systems Management Information Technology for Resources of Agriculture"**

**Methods and tools of modern automated control of technological processes in agriculture.** Specialized processes as facilities management and disturbances. Principles of automatic control systems. Automation of technological processes in crop and livestock production. Principles of DCS. Feeds and their characteristics. Description of facilities management. Control algorithm. Means of control system. Reliability and cost efficiency of DCS.

**Optimal automatic control.** Optimal control Problem. Criteria for optimization of agricultural production. Methods of optimal control theory. Calculation of variations, Pontryagin maximum principle, dynamic programming. Analytical design of optimal controllers. Optimal control for random perturbations. The synthesis of stochastic systems. Optimal observer.

**Technical equipment, automation equipment and automated management.** Principles of DCS. Feeds and their characteristics. Description facilities management. Control algorithm. Means of control system. Reliability and cost effectiveness of DCS.

**Microprocessor control system.** Architecture microprocessor and microcomputer, microprocessor programming in Assembler, microprocessor hardware system. Developing and debugging microprocessor systems in agricultural production. Discrete signals, their coding. DAC and ADC. The analysis in the time and frequency domains. Handling and observation. Synthesis of digital systems. Limitations in microprocessor control systems.

**Master's program "Electrified technology and electrical equipment in livestock"**

#### **Design of power plants and networks**

Methods for calculating of electro and electro-propulsion, electric methods of production lines, design of power grid, electrical power supply systems characteristics.

**Design of lighting systems and networks.** Design of lighting systems. Types of lighting systems. Rationing light levels, light levels, systems, methods of payment. Designing lighting networks. The choice of voltage and power schemes, layout of networks. Methods of selection and calculation of wirings and cables. Security lighting networks. Features of lighting livestock buildings. Methods for calculating the combined (natural and artificial) lighting. Execution of project documentation.

**Electromagnetic Processing of agricultural products.** Mechanism of action of the electromagnetic field in the processing of seed potatoes and aqueous solutions. Indication of the effect of electromagnetic processing. Changing the properties of agricultural products for electromagnetic treatment. Determining of optimal



electromagnetic treatment. Effect of electromagnetic processing potato plant growth and development, biometric parameters, yield, storage.

**Optical Electrotechnology.** Technological features for installations of radiant energy. Designing of optical energy. Designing of microwave radiation. Ultrasonic treatment plants.

**Master's program “Electrified technology and electrical equipment in seed and crop growing”**

**Electron-ion technology in agriculture.** Characteristics of electric fields and methods of charging particles. Electric separators. Artificial air ionization and electrical filters. Electro spray technology. Power supply units of electron-ion technology.

*Research oriented disciplines*

**Master program “Energy Efficient management of biotechnical objects”  
Fundamentals of operations research optimization theory.**

**Types of optimization problems.** Methods for unconstrained optimization. Comparison of methods. Methods of multivariate search. Gradient methods. Symleks method. Nelder-Mead method. Methods mediocre optimization. The method of stationary points. The method of Lagrange multipliers. Linear, integer and dynamic programming. The standard form of linear optimization models. Network model. Model of dynamic programming. Probabilistic model. Random (stochastic) processes. Markov processes. Game theory and decision making. Decision-making process. Practical application of queuing theory.

**Intelligent systems.** Theoretical principles of operation of calculated intelligence. Effective control algorithms. Features of intelligent manufacturing systems with respect to specific volume facilities, installations and equipment mechanization and electrification of production processes.

**Neuro information systems.** Basic concepts of neural networks. Properties of neural networks learning process. Hopfield neural networks, Hamming. Basic concepts of fuzzy logic. Fuzzy sets and fuzzy neural network.

**Adaptive system.** Classification of adaptive systems and the principles of their construction. Methods and algorithms for identification of dynamic systems. Systems of extreme regulation. Adaptive system model. Hierarchical suboptimal ACS. Algorithms for selecting of options in the task of adaptive management homogeneous finite Markov chains.

**Master's program:**

**“Electrified technology and manufacturing of electrical equipment in SG”**

**Electrified technology in agriculture.** Application of strong electric fields. The cultivation of electric shock. Electron-ion energy-saving technology in agricultural production. Thermoelectric converters and Heat accumulation of installation. Electrolysis feed electroosmosis, magnetic water treatment, ultrasound diagnosis and electro.

**Agricultural production in the field of corona discharge.** Electrophysical factors of corona discharge. The use of strong electric fields. The cultivation of electric shock. Electro and technology. Magnetic processing of materials.

**Electromagnetic Processing of agricultural products.** Research and electromagnetic processes of electro equipment in agriculture. Electrical installation with power and electromagnetic processing of agricultural materials, the basic theory of strong magnetic fields using seed treatment considering its features. Ozonation. Electric pulse technology.

**Spectrographic methods as processing of agricultural products is unique.** Studied modern spectrographic methods for determining the characteristics of the product. The analysis of characteristics of quality agricultural products processing different process in accordance with national and international legal instruments and standards.

**EDUCATIONAL AND RESEARCH INSTITUTE  
OF FORESTRY AND PARK-GARDENING MANAGEMENT**

**Director** - Doctor of Agricultural Sciences, Professor Petro I. Lakyda  
**Tel:** (+38044) 527-85-28  
**E-mail:** lakyda@nubip.edu.ua  
**Location:** educational building №1, room 119

**FACULTY OF FORESTRY**

**Dean** - PhD, associate professor Alexander Bala  
**Tel.:** (044) 527-84-22  
**E-mail:** bala@i.ua  
**Location:** building № 1, room 118

**Faculty organizes training of masters in the field:**

**8.05180101 “Wood processing technologies”**

**Graduating department:**

**Wood processing technologies**

**Tel.:** (044) 527-81-67

**E-mail:** opinchewskaya@gmail.com

**Head of the Department** – doctor of science, professor Olena Pinchevska

**8.09010301 “Forestry”**

**Graduating departments:**

**Forest Biology and Wildlife Management**

**Tel.:** (044) 527-82-38

**E-mail:** biol\_misl\_kaf@ukr.net

**Head of the Department** - doctor of science, professor Anatoly Goychuk

**Forest management**

**Phone:** (044) 527-83-70

**E-mail:** lakyda@nubip.edu.ua

**Head of the Department** – doctor of science, professor Petro Lakyda

**Silviculture**

**Tel.:** (044) 527-82-82

**E-mail:** levchenko@nubip.edu.ua

**Head of the Department** - doctor of science, professor Anatolii Bondar

**Forest melioration and optimization of forest-agricultural landscapes**

**Tel.:** (044) 527-82-37

**E-mail:** yukhnov@ukr.net

**Head of the Department** – doctor of science, professor Vasily Yukhnovsky

**Reforestation and afforestation**

**Tel.:(044) 87-47**

**E-mail:** fmbrovko@ukr.net

**Head of the Department** – doctor of science, professor Fedir Brovko

**Forest Mensuration and inventory**

---

**Tel.: (044)527-85-23**

**E-mail: aagirs@ukr.net**

**Head of the Department** – doctor of science, professor Girs Oleksandr

**8.09010302 “Wildlife service”**

**Graduating departments:**

**Forest Biology and Wildlife Management**

**Tel.: (044) 527-82-38**

**E-mail: biol\_misl\_kaf@ukr.net**

**Head of the Department** – doctor of science, professor Anatoly Goychuk.

**PARK GARDENING AND LANDSCAPE ARCHITECTURE FACULTY**

**Dean** – Doctor of Agricultural Sciences, Professor Serhii B. Kovalevskii

**Tel: (+38044) 527-89-23**

**E-mail: s.kovalevsky@ukr.net**

**Situated: Educational building № 1, room 67**

**8.09010303 “Park and Gardening Management”**

**Departments:**

**Landscape architecture and landscape construction:**

**Tel.: (+38044) 527-82-96**

**E-mail: stplyt@yandex.ru**

**Head of the department** – Candidate of Agricultural Sciences, associated Professor Olha V. Zibtseva

**Landscape gardening and floristic:**

**Tel.: (+38044) 258-47-27,**

**E-mail: sp\_fito\_pzs@ukr.net**

**Head of the department** – Doctor of Biological Sciences, Professor Serhii Y. Popovych

---

**Masters training**  
**Specialty “WOOD PROCESSING TECHNOLOGIES”**  
**Branch of knowledge “Wood processing”**

**Form of training, licensed number of students:**

- |                  |    |
|------------------|----|
| – full-time      | 50 |
| – correspondence | 50 |

**Term of study**

1,5 year

**Credits**

90 ECTS

**Language of teaching**

Ukrainian

**Qualification of graduates**

**Master’s degree in of wood processing technologies**

**The concept of training**

Master's training in the specialty involves the assimilation of knowledge and skills of developing the designs and technologies of wood materials and products manufacturing, determination of their characteristics and quality level, mastering the techniques for analyzing of the existing processes, planning and carrying out the researches aimed at the optimization and improving woodworking industry processes.

After the successful completion of master's education the graduate should be able to solve the following problems:

- To analyze the technical process of a certain product manufacturing and to make recommendations for its improvement;
- To analyze the structure of wood products and to make recommendations for its improvement;
- To develop the routing scheme of the certain wood product;
- To develop the structure of the certain wood product and to draw it;
- To calculate the cost of the certain wood product manufacturing and the payback period on its implementation;
- To adjust the machines for certain wood products manufacturing;
- To calculate the parameters of power and aspiration for a particular technological process;
- To give the scientific evidence concerning the changes of a timber drying equipment structure.

**Production oriented master program**

***Master program “Modern wood processing technologies”***

The basis of the master's program is a systematic approach to the study of woodworking technology and forming of students' ability to use rationally the equipment, wood and energy. Disciplines cover the theoretical and practical aspects of the technologies of wood products manufacturing, trends of the woodworking technology, modern requirements for wood products, features of the modern woodworking machinery, new materials used in the wood products manufacturing, new accessories, methods of the details dimensions calculations of the contemporary structural wood products, the design of technologies development directions, requirements to furniture products, basic artistic design, the main features of furniture styles, modern trends of the style solutions for the furniture products and the means of their implementation.

### **Sphere of graduates employment**

Masters in “woodworking technologies” use their skills in related educational institutions of I-II and III-IV accreditation levels, government and commercial enterprises of the production and sale of construction materials, Ukrainian Research Institute of Nanobiotechnology, government and commercial woodworking and furniture enterprises (engineer-technologist, Controller of the wood production, specialist, leading specialist, head of the production unit, and head of the company). Besides, this level of the professional training allows working as a junior researcher, researcher, senior researcher, lecturer, assistant in research and educational institutions, to participate in the international research projects.

### **Research oriented master program**

#### ***Master program “Scientific basis of wood drying resource-saving technologies”***

The basis of the master's program is a comprehensive approach to the study of the wood drying resource-saving technologies and forming the students' conscious balanced approach to the managing of the drying quality and rational use of energy resources. Disciplines covers the theoretical and practical aspects of the resource-saving technologies of wood drying with maximum preservation of natural properties of the drying material, the advanced study of the anatomical and physical properties of wood, the polymer production under conditions of dry atmosphere, the designing of the devices for the wood drying, the drying quality assessment methods according to the materials standards ISO, EN, DSTU, the modes of the polymer production drying, the prediction of timber drying quality, the consumption of heat and electricity for veneer and chopped raw material drying, the cost of process, ways to reduce the energy costs.

### **Sphere of graduates employment**

The masters of “woodworking technologies” use their skills in related educational institutions of I-II and III-IV accreditation levels, government and commercial enterprises of the production and sale of construction materials, Ukrainian Research Institute of Nanobiotechnology, government and commercial woodworking and furniture enterprises (engineer-technologist, Controller of the wood production, specialist, leading specialist, head of the production unit, head of the company). Besides, this level of the professional training allows to work as a junior researcher, researcher, senior researcher, senior researcher, lecturer, assistant in research and educational institutions, to participate in the international research projects.

### **Practical training**

The bases of the practical training are educational, scientific, educational and industrial laboratories of the Departments of the institute VP NULES of Ukraine "Boyarka Forest Research Station", as well as the leading forestry enterprises of the State Agency of forest resources of Ukraine and private woodworking enterprises.

### **Proposed Topics for Master Theses**

1. Technology of facades finishing of solid wood for the furniture at woodworking enterprises.
  2. Prospects for the introduction of deck board production technology to the woodworking industry.
  3. Investigation of accuracy and workmanship of the molded products on the woodworking industry.
-

**MASTER DEGREE PROGRAMS**

4. Measures on improving the technological process of furniture manufacturing in the woodworking industry.
5. Furniture manufacturing technology at the enterprise.
6. Proposals concerning the improvement the technology of floorboards manufacturing in the woodworking industry.
7. Improving the technological process of polymer production in the woodworking industry.
8. Modern methods of coatings application while manufacturing the furniture products.
9. Methods of use of infrared heaters for veneer drying.
10. Research of the volume indicators of round timber cutting for the timber production in the woodworking industry.

**Academic rights of applicants for a master program**

In addition to the specialty of “Wood processing technologies” the applicants owning a Bachelor's degree in the specialty “Wood processing technologies” can continue studying in specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty: “Wood processing technologies”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of social and humanitarian training*</i>					
1	Labor protection (in the production industry and educational and research institutions)	3	72	1,3	2,0
2	Pedagogy and teaching methods in Higher School	2	126	2,3	3,5
3	Intellectual property	1	90	1,7	2,5
4	Civil protection	2	126	2,3	3,5
5	Professionally-oriented Foreign language	1	54	1,0	1,5
6	Philosophy of Science	1	54	1,0	1,5
<i>Total number</i>			<i>522</i>	<i>9,6</i>	<i>14,5</i>
<i>1.2. Cycle of professional training *</i>					
1	Research and Organization of Science in Woodworking	2	108	2,0	3,0
2	Theory and Practice of Wood Cutting	1	198	3,7	5,5
3	Theory of Wood Thermal Treatment	2	198	3,7	5,5
4	Theory and Technology for Wood Agglutination	2	198	3,7	5,5
5	Actual Problems on Mechanical Wood Working	1	252	4,7	7,0
<i>Total number</i>			<i>954</i>	<i>17,8</i>	<i>26,5</i>
<i>Total according to regulatory part</i>			<i>1476</i>	<i>27,4</i>	<i>41,0</i>
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional training</i>					
1	The international forestry and international forestry resources	1	36	0,7	1,0
2	Strategy of nature and society sustainable development	1	36	0,7	1,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<i>The total number</i>			72	1,4	2,0
<i>Production oriented disciplines</i>					
Master program "Modern wood processing technologies"					
2.1. <i>Disciplines chosen by University</i>					
2.1.1. <i>Cycle of professional training</i>					
1	Technology of Special Woodworking Industries	3	54	1,0	1,5
2	Planning at the Woodworking Industry enterprises	3	216	4,0	6,0
3	Simulation and Optimization of Manufacturing Processes	3	54	1,0	1,5
4	Modern Methods of Enterprises Design Of Mechanical Wood Processing	3	126	2,3	3,5
5	Manufacturing Technology Of Wood Constructions	2	270	5,0	7,5
6	Technology Of Special Woodworking Industries	1	108	2,0	3,0
<i>The total number</i>			828	15,3	23,0
2.2. <i>Disciplines chosen by students</i>					
2.2.1. <i>Cycle of professional training</i>					
1	Modern Technology Of Furniture Production. Modern Technology Of Furniture Production	3	54	1,0	1,5
2	Foreign trade in the wood-processing enterprises	3	54	1,0	1,5
<i>The total number</i>			108	2,0	3,0
Research oriented disciplines					
Master program "Scientific basis of saving technologies of wood drying"					
2.1. <i>Disciplines chosen by university</i>					
2.1.1. <i>Cycle of professional training</i>					
1	Scientific Basis Of Wood Drying	3	108	2,0	3,0
2	Manufacturing Technology Of Wood Constructions	1	108	2,0	3,0
3	Modern Methods Of Enterprises Design Of Mechanical Wood Processing	2	270	5,0	7,5
4	Management Of Timber Drying Quality	3	126	2,3	3,5
<i>The total number</i>			648	11,3	18,0
2.2. <i>Disciplines chosen by students</i>					
2.2.1. <i>Cycle of professional training</i>					
1	Modern Technology Of Furniture Production. Modern Technology Of Furniture Production.	3	162	3,0	4,5
<i>The total number of selected by the student</i>			162	3,0	4,5
<i>The total number of selected part</i>			2052	38,0	57,0
Practical training			324	6,0	9,0
Preparation and defense of master's thesis			360	6,7	10,0
Total for specialty			3240	60,0	90,0

**Annotations of disciplines in the curriculum**

1.1. **REGULATORY ACADEMIC DISCIPLINES**

1.2. *Cycle of social and humanitarian training\**

**Labor protection (in the production industry and educational and research institutions).** System of safety standards and occupational health, protection systems of the human body from: heat balance disorders, harmful effects of evaporation and gas, industrial dust, noise, vibration, electric current. Fire protection systems, safety systems at sites State Committee.

**Pedagogy and teaching methods in higher education.** Scientific concept of pedagogy as a science, methodological foundations, main categories, the field of

pedagogy, methods of educational research, the nature of the learning process, didactic principles, forms and methods of training and education, types of education, educational technology.

**Intellectual property.** The concept of intellectual property. Intellectual property as a result of creative activity. Intellectual property as a right. The evolution of intellectual property. Intellectual property rights. Classification of intellectual property rights (copyright and related ones). Subjects of intellectual property rights. The system of Ukrainian legislation on intellectual property.

**Civil protection.** Common patterns of occurrence and development hazards emergencies. Their properties, the possible impact on human life and health. Safety in emergencies. Organization and management of Safety.

**Professionally-oriented Foreign language.** Speech Etiquette communication: language models salutation, civility, forgiveness, coordination and more. Linguistic and cultural aspects of international exhibitions. Lexico-grammatical and a minimum of linguistic communicative level presentations. Professionally-oriented foreign-language sources. Methods of finding new information in the foreign-language sources. Linguistic methods for analytical processing of foreign sources. Vocabulary and grammatical skills. Methods and linguistic features of annotation and summarization of foreign sources. Electronic foreign-language sources. Finding information on the Internet by using keywords. Fundamentals of Translation professionally oriented foreign-language sources.

**Philosophy of Science.** Philosophy and its object, the function and place in contemporary culture. Knowledge as a subject of philosophical analysis. Variety of forms of knowledge. Features of scientific knowledge. Methods and forms of scientific knowledge. Theoretical models and laws of science. Ontological problems of modern science. Logical and epistemological problems of modern science. Historical and philosophical questions: from antiquity to nowadays. Ontology. Epistemology. Philosophy of Science, Logic and Methodology of scientific knowledge. Social Philosophy.

### *1.2. Cycle of practical training \**

**Research and Organization of Science in Woodworking.** Students learn the theory on dimensionality, physical modeling, statistical methods for object models building. Regressive model of the research object. Elements of the experiment planning theory. Plans of the multifactor experiments. Characteristics of the main stages of the research. Principals of the patents, features of the patents at the woodworking.

**Theory and Practice of Wood Cutting.** Scientific principles of the wood cutting technology, theory of logs cutting for the timber, posture calculation and planning of logs cutting, wood cutting optimization criteria, standardization of raw at the timber cutting, methods of experiments conducting at the timber cutting and its planning, analysis of the equipment and technologies of logs cutting, simulation of logs cutting; practical recommendations for the technological processes of the timber production.

**Theory of Wood Thermal Treatment.** Convective heat transfer. Similarity theory. Heat treatment of wood. Technology and equipment of the heat treatment. Heat and moisture exchange in the drying process. Aerodynamics. Equipment and technology of sheet and powdered materials drying. Alternative heat sources.

**Theory and Technology for Agglutination of Wood.** Structure and properties of the wood composite materials. Modern understanding of the mechanisms of wood composite materials creation. Polymers destruction mechanism. Kinetic concept of strength. Formation terms of the adhesive joints. Basics of the compaction theory. The essence of the compaction process. Modification of wood composites.

**Actual Problems of Mechanical Wood Working.** Theoretical foundation of wood cutting and wood-based materials, the direction of the cutting theory, ways of improving of wood cutting



## MASTER DEGREE PROGRAMS

tools and woodworking equipment, modes of cutting, milling, turning, grinding and deep processing of wood, ways of increasing the period of stability of wood-cutting tools.



## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional training\**

**The international forestry and international forestry resources.** Discipline reveals the history and traditions of world forestry and silviculture and their current status in different countries and on different continents. Main focus of study reveals on Eastern Europe, where formed the origins of modern forestry in Ukraine. Modern priorities of forestry under anthropogenic pressure and the need for forest conservation are studied. The main types of the world's forests and their distribution by continents, the main types of forest resources and historical features of their use, the history of the formation and transformation of silvicultural systems based on socio-economic conditions, the main international organizations dealing with forests, decisions and resolutions of international forest forums and forest implementation of regional and global forest policy are considered.

**Strategy of sustainable development of nature and society.** Discipline "Strategy of sustainable development of nature and society" refers to advanced training, and provides an interdisciplinary and systematic approach to the main problems of interaction between humans and the environment in terms of policies and strategies for sustainable development. In accordance with the recommendations of the UN Conference on Environment and Development (Rio de Janeiro, 1992), "Agenda for the 21st century", Conception of Ukraine's transition to sustainable development (2006) study of sustainable development should include part in a program of training in specialties, or be organized as a separate general course.

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional training\**

#### *Production oriented disciplines*

### **Master program "Modern wood processing technologies"**

**Technology of Special Woodworking Industries.** Technology of special woodworking industries: consumer products, cooperage products, flooring, match, chip packaging, carbonization. Flow charts, machinery, equipment, raw materials and production quality requirements.

**Planning at the Woodworking Industry Enterprise.** Subject, method and objectives of the discipline. The system of plans operated at the woodworking industry. Business planning at the workplace. Regulatory information management of the planning process. Production program and its formation. Work and wages planning over / on plants. Planning of production costs according to the market conditions. Financial planning for the woodworking enterprises.

**Simulation and Optimization of Manufacturing Processes.** Assessment of the main parameters of the statistical population. Analysis of the functional dependencies from the parameters of influence. Planning principles the full factor experiments. Construction of the mathematical models using the experimental plans of the second and third order. Optimization of the study objects by the coordinate-wise search and steep climb. Simplex method to optimize the planning of research facilities.

**Modern Methods of Enterprises Design of Mechanical Wood Processing.** General design, technological processes design, design of conveyor lines, designing of the instrumental sharpen, fitter- mechanical and other service shops, the calculation of vehicles; production energy-saving, ventilation, heating of wood-service and additional shops, forest resources of Ukraine and ways of their use improvement.

**Manufacturing Technology of Wood Constructions.** Subject content: the modern state of wooden construction production, joinery and parquet goods, wooden house-

building, classification of joinery, components and elements of joinery, cabinet joints types, methods of mechanical testing, rules of wood products design and their requirements; materials for joinery, joinery manufacturing processes, preparation of production, work safety in carpentry and construction industries, advanced product design and use wood imitation, the main structural systems of the wooden buildings carpentry at the construction, carpentry work on the structure, ways of increasing the durability of wooden structures.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional training\**

**Modern Technology of Furniture Production.** The study includes the requirements for furniture products, principles of the artistic design, preconditions of stylistic characteristics development of furniture products, the main features of furniture styles, modern trends of furniture products style and means of their implementation.

**Foreign trade in the wood-processing enterprises.** Purpose of the course - acquisition of theoretical foundations in the area of foreign trade the forestry sector, and to develop practical skills and the ability to apply the acquired knowledge in export-import operations woodworking industry.

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of professional training\**

*Production oriented disciplines*

**Master program “Scientific basis of saving technologies of wood drying”**

**Scientific Basis of Wood Drying.** Moisture in the capillary-porous colloidal bodies, carrying moisture in the wood; periods of constant and falling rate of drying. drying duration, drying and cracking of wood during the drying, structural and mechanical properties of wet bodies, the impact of the drying on the kinetics of convection drying process and the quality of the material.

**Manufacturing Technology of Wood Constructions.** Subject content: the modern state of wooden construction production, joinery and parquet goods, wooden house-building, classification of joinery, components and elements of joinery, cabinet joints types, methods of mechanical testing, rules of wood products design and their requirements; materials for joinery, joinery manufacturing processes, preparation of production, work safety in carpentry and construction industries, advanced product design and use wood imitation, the main structural systems of the wooden buildings carpentry at the construction, carpentry work on the structure, ways of increasing the durability of wooden structures..

**Modern Methods of Enterprises Design of Mechanical Wood Processing.** Scientific basis of design, technological processes design, design of conveyor lines, designing of the instrumental sharpen, fitter- mechanical and other service shops, the calculation of vehicles; production energy-saving, ventilation, heating of wood-service and additional shops, forest resources of Ukraine and ways of their use improvement. The tasks of the discipline is the study of the methodological, organizational and scientific bases of industrial buildings design, the bases of design processes in the production, composition and volume of the project work, methods of their implementation, composition of the main project documentation, principles of the computer-aided design, graduate design features and fundamentals of service shops design.

**Management of Timber Drying Quality.** The quality of timber drying; the factors influencing the achievement of the required drying quality; simulation of the drying process, taking into account the characteristics of the probabilistic dryers and wood features, the selection of the optimal drying mode, drying quality prediction.

---

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional training\**

**Modern Technology of Furniture Production.** The study includes the requirements for furniture products, principles of the artistic design, preconditions of stylistic characteristics development of furniture products, the main features of furniture styles, modern trends of furniture products style and means of their implementation.

**Foreign trade in the wood-processing enterprises.** Purpose of the course - acquisition of theoretical foundations in the area of foreign trade the forestry sector, and to develop practical skills and the ability to apply the acquired knowledge in export-import operations woodworking industry.

**Resource-saving technologies of drying wood.** Classification of methods of drying wood and trends. Methods drying lumber drying technology, to calculate the cost of heat, energy-efficient drying methods, special methods of drying lumber, ways to reduce energy costs for drying.

**Masters training  
in specialty “FORESTRY”  
Branch of knowledge “Agriculture and Forestry”**

**Form of training, licensed number of students:**

– Full-time	100
– Correspondence	75
<b>Term of study</b>	<b>1,5 years</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of training</b>	<b>Ukrainian</b>
<b>Qualification of graduates</b>	<b>Master of Forestry</b>

**The concept of training**

The full operation of forestry branch in a market economy requires highly specialized professionals capable to solve specific problems of production and research directions. To the basis of formation of Master programs contents were put:

- conformity with existing and future needs of the forestry;
- flexibility in the system of training specialists for their adaptation to the rapidly changing demands of national and international labor markets;
- integration of educational, research and innovation activities on the pattern of the leading research universities in the world;
- logical relationship of Master's training programs with the programs of "Bachelor" education level.

The content of masters education is determined by relevant branch standard of higher education of Ukraine, namely: educational qualifying characteristics, educational and vocational training program.

**Production oriented master program**

***Master program “Silvics and practical silviculture”***

The program provides training specialists with deeper understanding of the nature of forest and forest multivariate relationships with the environment, growing and use of forests, ensuring the successful adaptation of graduates in the workplace.

**Sphere of graduates employment**

After Master's course graduation, graduates can be employed in such enterprises: state forestry, forestry and hunting enterprises of the State Agency of forest resources of Ukraine (forester, chief forester, engineer of forest use, forestry engineer, engineer of forest plantations), Ukrainian center for training, retraining and advanced training of specialists of forestry “Ukrtsentrkadrylis” related higher education institutions of I-IV accreditation levels, zoological parks, organizations of the Nature Reserve fund, Ukrainian State design Institute of Forestry “Ukrdiprolis”, Ministry of Ecology and Natural Resources of Ukraine (researcher).

***Master program “Forest melioration”***

Training is carried out in order to master modern scientific and practical knowledge of creation and use of protective forest plantations, as an integral part of zonal anti-erosion systems and the basis of architectonic of forest agricultural landscapes.

---

### **Sphere of graduates employment**

After graduation, graduates can be employed in such enterprises: state forestry, forest-hunting and hunting enterprises of the State Agency of forest resources of Ukraine (forester, chief forester, forestry engineer, agroforestmeliorator), Ukrainian Research Institute of Forestry and agroforestmelioration, Ukrainian center for training, retraining and advanced training of forestry specialists "Ukrtsentrkadrylis", related higher education institutions of I-IV accreditation levels, zoological parks, the Nature Reserve Fund organizations, Ukrainian State Design Institute of Forestry "Ukrdiprolis, Ministry of Environment and Natural Resources of Ukraine (researcher).

### ***Master program "Forest Protection"***

The program focuses on students' acquirement of complex professional knowledge and practical skills for solving important problems of development bio-ecological fundamentals of a comprehensive protection and recovery of forest biomes, studying forest pathogens and working out the system of measures to control them.

### **Sphere of graduates employment**

Graduates are employed in such enterprises as: state forestry and hunting enterprises of the State Agency of Forest Resources of Ukraine (as forest ranger, chief forest ranger, forestry engineer, forest protection engineer), State forest protection association (forest pathologist, chief forest pathologist), Ukrainian center for training, retraining and advanced training of forestry specialists, associated higher education institutions of I-IV accreditation levels, zoological parks and Nature Reserve Fund institutions, Forestry Project Institute, Ministry of Ecology and Natural Resources of Ukraine (researcher positions).

### ***Master program "Renewal of forest and afforestation"***

Program foresees deep mastery of theoretical knowledge and newest technologies in organization and exploitation of permanent forest seed base, forest seed production, microklonal propagation of woody plants, forest and ornamental nursery, recreation of forests, on principles of ecologically oriented forestry, forest plantations, rehabilitation of technogenic affected earths and increase of forest productivity by silvicultural methods.

### **Sphere of graduates employment**

Graduates can be employed on such enterprises as: State forestry and hunting enterprises of the State agency of forest resources of Ukraine (forester, chief forester, forestry engineer, chief of forest nursery), Ukrainian Research Institute of forestry and agroforestmelioration named by G.M. Visotskii, Ukrainian center of training, retraining and advanced training of forestry specialists, associated higher education institutions of I-IV accreditation levels, zoological parks and Nature Reserve Fund institutions, Forestry Project Institute, Ministry of Ecology and Natural Resources of Ukraine (researcher positions).

### ***Master program "Forest management"***

The program provides students with skills in forest plantations inventory by modern methods, ability to work with the database "Forest Fund of Ukraine", knowledge of forest management activities to ensure sustainable use of forest resources.

### **Sphere of graduates employment**

Graduates may be employed at such enterprises as: State forest enterprises and hunting enterprises of State Agency of Forest Resources of Ukraine (forester, chief forester, forestry engineer), Ukrainian State Forest Inventory Corporation (forest inventory

---

engineer, chief engineer of forest management), Ukrainian Centre of training, retraining and advanced training of forestry staff, forestry colleges and institutes, Ukrainian Project and Research Institute of Forestry, Ministry of Ecology and Environment of Ukraine (scientist).

***Master program “Management of forest resources and forest business”***

Master's program is focused on training specialists in economics for forestry sector, able to develop and implement strategic measures in forest management and forest use at different levels of economy in a market conditions.

**Sphere of graduates employment**

After graduation, graduates can be employed in such enterprises as: State forestry, forestry-hunting and hunting enterprises of the State Agency of Forest Resources of Ukraine (forester, chief forester, forest use engineer, forestry engineer) Ukrainian center for training, retraining and advanced training of forestry staff “Ukrcentrkadrylis”, related higher education institutions of I-IV accreditation levels, zoological parks, the Nature Reserve institution, Ukrainian State Planning Institute of Forestry “Ukrdiprolis”, Ministry of Ecology and Natural Resources of Ukraine (researcher).

**Research oriented master programs**

***Master program “Theoretical basis for monitoring and reducing risk of forest fires” (Forest fires management)***

The program provides future specialists with theoretical knowledge and skills in principles of regional and national policies development in the field of fire management in natural landscapes, fire safety personnel, organization of forests fire protection system and environmental safety during fires for forest specialists

**Sphere of graduates employment**

After graduation, graduates can be employed in such enterprises as: state forestry, forestry-hunting and hunting enterprises of the State Agency of forest resources of Ukraine (forester, chief forester, engineer of forest use, forestry engineer, engineer of forest protection), Ukrainian center for training, retraining and advanced training of forestry staff “Ukrtsentrkadrylis”, related higher education institutions of I-IV accreditation levels, zoological parks, the Nature Reserve fund, Ukrainian State design Institute of Forestry “Ukrdiprolis”, Ministry of Ecology and Natural Resources of Ukraine (researcher).

***Master program “Forest-agricultural landscape study”***

The program includes a series of courses to study spatial structures, ordering of protective plantings, phytomelioration of urban landscapes, forest melioration of highways, monitoring of agro forest landscapes and anthropogenic impacts on the landscape.

**Sphere of graduates employment**

After graduation, graduates can be employed in such enterprises as: state forestry, forestry and hunting and hunting enterprises of the State Agency of forest resources of Ukraine (ranger, chief ranger, forestry engineer, agro forest meliorator), Ukrainian Research Institute of Forestry and agro forestry, Ukrainian center for training, retraining and advanced training of forestry staff “Ukrtsentrkadrylis” related higher education institutions of I-IV accreditation levels, zoological parks, the Nature Reserve Fund, Ukrainian State Design Institute of Forestry “Ukrdiprolis”, Ministry of Environment and Natural Resources of Ukraine (researcher).

---

***Master program “Biological and energy productivity of forest plant communities (phytocoenoses)”***

The program focuses on theoretical and practical training of students for solving, scientific proofing and development of standards of evaluation and prediction of dynamics of live biomass components and deposited carbon in forest stands of main forest-forming tree species of Ukraine.

**Sphere of graduates employment**

After graduation, graduates may be employed on such enterprises as: state forestry, forestry and hunting, and hunting enterprises of State Agency of Forest Resources of Ukraine (forester, chief forester, forest use engineer, forestry engineer, forest plantations engineer), Ukrainian State Production Association "Ukrderzhlisproekt" (engineer-mensurator, chief engineer on forest inventory), Ukrainian center for training, retraining and advanced training of forestry employees "Ukrtsentrkadrylis", related higher education institutions of I-IV accreditation levels, zoological parks, Nature Reserve fund institutions, Ukrainian State Planning-Research Institute of Forestry "Ukrdiprolis", Ministry of Ecology and Natural Resources of Ukraine (scientist).

**Master program of applied biology on specialization “Laboratory work” expert-control sector of employment**

**Master program “Methods of entomological control in plant-growing and nature use”**

The program focuses on theoretical and practical training students to solve, scientific study and development of methods of entomological monitoring populations of pests of woody plants.

**Sphere of graduates employment**

After graduation, graduates can be employed in specialized laboratories subordinated to the State Phytosanitary Service of Ukraine, the Main State Inspection for Plant Protection, Ministry of Ecology and Natural Resources of Ukraine, the State Administration of Environmental Protection, State Environmental Inspectorate, the State Agricultural Inspection economy, the State Agency of forest resources of Ukraine, the State Sanitary and Epidemiological Service of Ukraine, services and agencies that provide environmental control, management and regulation of territories and objects of natural reserve fund etc., and are focused on monitoring quality of environment.

Master's programs for training specialists in applied biology on specialization "laboratory work" of expert-control sector of employment based on education and research laboratories of educational and research institutes and the Ukrainian Laboratory of Quality and Safety of Agricultural Products ensure the development of modern methods of chemical, physical and chemical, biological, environmental assessment and evaluation of quality and safety related facilities according to international standards.

**Practical training**

Bases for practical training are: educational, scientific, educational and industrial laboratories of the Institute's departments and "Boyarka Forest Research Station", Subdivision of NULESU, educational-scientific-research nursery garden of the Department of reforestation and afforestation, Botanical Garden of NULES of Ukraine and leading forestry enterprises of the State Agency of Forest Resources of Ukraine.

---



### Proposed Topics for Master Theses

1. Analysis and improvement of methods for stands growing stock assessment of forest enterprise.
2. Role of erosion and reclamation properties ravine and gully vegetation in forest enterprises.
3. Sanitary condition of arboretum: cells of pathogens and insect pests.
4. Increasing of productivity and improving of the quality of the forest plantations by care cuttings in forestry enterprises.
5. Improvement of forest fire protection in forestry enterprises.
6. Improvement of high-quality composition and increase of the productivity of the forest planting is in forest enterprises.
7. Natural renewal of main forestry breeds is in the prevailing types of site conditions in lisogospodarskih enterprises.
8. Ways of perfection of growing of forest cultures are in forestry enterprises
9. Sanitary condition Arboretum: cell pathogens and insect pests.
10. Current status and characteristics game management in Ukraine.

### Academic rights of applicants for a master program

In addition to the specialty "Forestry" entrants who have a Bachelor's degree diploma of the direction of training "Forestry and Park Gardening" can continue studying for specialties of field of training "Agriculture and Forestry":

- • 8.09010302 "Wildlife service" (see p. 296);
- • 8.09010303 "Park and Gardening Management" (see p. 301);

specialties in the **branch of knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
- 8.18010021 – "Pedagogy of Higher School"(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – "Educational Institution Management" (see p. 427).

### Curriculum for specialist training of the educational and qualification level "Master" in specialty "Forestry"

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian and social training</i>					
1	Psychology of Management	3	54	1,0	1,5
2	Philosophy of Science	1	54	1,0	1,5
3	Business foreign language	1	54	1,0	1,5
Total number			162	3,0	4,5
<i>1.2. Cycle of professional training</i>					
1	Methodology of scientific research	3	126	2,3	3,5
2	Forest policy	1	72	1,3	2,0
Total number			198	3,6	5,5
<i>1.3. Cycle of professional training</i>					
1	Forestry production management	1	90	1,7	2,50
2	Forestry production planning	1-2	180	3,3	5,00
3	Regulation of forest productivity	1	144	2,7	4,00
4	Labor Protection	1	72	1,3	2,00

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
5	Information technologies in forestry	1	90	1,7	2,50
Total number			576	10,7	16,0
Total according to regulatory part			936	17,3	26,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	World forestry and world forestry resources	1	36	0,7	1,0
Total chosen by university			36	0,7	1,0
Production oriented disciplines					
Master Program "Silvics and practical silviculture"					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Logging	2-3	216	4,0	6,0
2	Forest roads and forest vehicles	2	144	2,7	4,0
3	Forest commodity	2	144	2,7	4,0
4	Wood processing	2	126	2,3	3,5
5	Game science (hunting)	2	126	2,3	3,5
6	Forest tapping	2	126	2,3	3,5
7	Forest Ecology and typology	3	126	2,3	3,5
8	Increase of forest productivity by forestry methods	3	180	3,3	5,0
9	Industrial methods of forest growing	3	90	1,7	2,5
Total chosen by university			1278	23,6	35,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Non-wood products and accessory use of forest	2	108	2,0	3,0
2	Biological bases of thinning	3	108	2,0	3,0
Total selected by the students			216	4,0	6,0
Total number of elected part			1530	27,6	42,5
Master program "Forest Protection"					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Forest pathology	2	180	3,3	5,0
2	Mathematical modeling of pest and pathogen populations	3	144	2,7	4,0
3	Forest nematology	2	162	3,0	4,5
4	Technology of integrated forest protection	2-3	288	5,3	8,0
5	Diagnosis of pests and pathogens	2	144	2,7	4,0
6	Woody plants immunity to pathogens	2	180	3,3	5,0
7	Forecast pathogens and pests	3	180	3,3	5,0
Total chosen by university			1278	23,6	35,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Bacterioses of forest woody plants	2	108	2,0	3,0
2	Mycotrophy of woody plants	3	108	2,0	3,0
Total selected by the student			216	4,0	6,0
Total number of elected part			1530	27,6	42,5
Master program "Forest renewal and afforestation"					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Modern technologies of nursery	2	198	3,7	5,5
2	Microclonal propagation of woody plants	2	180	3,3	5,0
3	Forestry methods of rehabilitation of technologically-disturbed lands	3	180	3,3	5,0
4	Industrial methods of forest growing	3	180	3,3	5,0
5	Ecological bases of reforestation and	2	180	3,3	5,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
	afforestation				
6	Increase of forest productivity by silvicultural methods	3	216	4,0	6,0
7	Sort forest seed study	2	144	2,7	4,0
Total chosen by university			1278	23,6	35,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Forest plants of green belts	2	108	2,0	3,0
2	Application of fertilizers in forestry	3	108	2,0	3,0
Total selected by the student			216	4,0	6,0
Total number of elected part			1530	27,6	42,5
Master program "Management of forest resources and forestry business"					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Management of forest resources	2-3	198	3,7	5,5
2	Forest commodity science	2	144	2,7	4,0
3	Information systems in forestry	2	162	3,0	4,5
4	Finance and credit	2	144	2,7	4,0
5	Economics of nature use	2	144	2,7	4,0
6	Foreign economic activity in forest sector	2-3	162	3,0	4,5
7	GIS-technologies in forestry	3	180	3,3	5,0
8	Forest productivity modeling	3	144	2,7	4,0
Total chosen by university			1278	23,6	35,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Marketing in forestry	2	108	2,0	3,0
2	Computer technologies in forestry	3	108	2,0	3,0
Total selected by the students			216	4,0	6,0
Total number of elected part			1530	27,6	42,5
Master Program "Methods of entomological control in plant-growing and nature use"					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Biocenology of insects	2	162	3,0	4,5
2	Methodology and technical support of modern entomological research	2	108	2,0	3,0
3	Phytopathological and environmental assessment	3	126	2,3	3,5
4	System analysis of environmental quality and crop production products	3	108	2,0	3,0
5	Management of laboratory activities quality	3	90	1,7	2,5
6	Monitoring of entomopathological complex	2-3	288	5,3	8,0
7	Regulation of population size of entomopathological complex	2	180	3,3	5,0
Total chosen by university			1062	19,5	29,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Forecast of pathogens and pests	2	144	2,7	4,0
2	Laboratory studies in entomology	2	144	2,7	4,0
3	Entomopathological expertise	2	144	2,7	4,0
Total selected by the students			432	8,1	12,0
Total number of elected part			1530	27,6	42,5
Master program "Forest melioration"					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Ordering of protective plantations	2	108	2,0	3,00
2	Erosion science	2	162	3,0	4,50
3	Forest reclamation of lands	2	162	3,0	4,50

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
4	Forest-agricultural landscapes	2	144	2,7	4,00
5	Systems of soil erosion protection	2-3	252	4,7	7,00
6	Protective afforestation	3	162	3,0	4,50
7	Optimization of forest-agricultural landscapes	3	162	3,0	4,50
8	Zonal anti-erosion systems	3	126	2,3	3,50
Total chosen by university			1278	23,6	35,50
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Protective plantations at the transport roads	2	108	2,0	3,00
2	Hydro technical melioration	2	108	2,0	3,00
Total selected by the students			216	4,0	6,0
Total number of elected part			1530	27,6	42,5
Master program "Forest management"					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Special types of forest mensuration	2	216	4,0	6,00
2	Forest monitoring	2	162	3,0	4,50
3	Special types of forest management	2-3	324	6,0	9,00
4	Information systems in forestry	2	180	3,3	5,00
5	GIS-technologies in forestry	3	216	4,0	6,00
6	Modeling of forest productivity	3	180	3,3	5,00
Total chosen by university			1278	23,6	35,50
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Environmental economics	2	108	2,0	3,00
2	Computer technologies in forestry	3	108	2,0	3,00
Total selected by the students			216	4,0	6,0
Total number of elected part			1530	27,6	42,5
Research oriented disciplines					
Master Program "Biological and energetic productivity of forest plant communities"					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Forest monitoring	2	180	3,3	5,0
2	GIS-technologies in forestry	3	216	4,0	6,0
3	Modeling of forest productivity	3	162	3,0	4,5
4	Forest inventory and cadastre	3	180	3,3	5,0
5	Databanks of forest information	2	180	3,3	5,0
6	Information systems in forestry	2	180	3,3	5,0
7	Economics of nature use	2	144	3,3	4,0
Total chosen by university			1242	23,5	34,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Bioenergetic potential of forests	2	162	3,0	4,5
2	Computer technologies in forestry.	3	90	1,7	2,5
Total selected by the students			252	4,7	7,0
Total number of elected part			1530	28,3	42,5
Master program "Theoretical basis of monitoring and reducing of forest fires risk" (Forest fires management)					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Use of GIS for forest fires modeling and predicting	3	162	3,0	4,5
2	Forest fires behavior	2	126	2,3	3,5
3	Forest fuel materials	2	198	3,7	5,5
4	Influence of weather conditions on forest fire danger	2	126	2,3	3,5
5	Organization of forest fire protection	2	180	3,3	5,0
6	Strategies of forest fire fighting	3	126	2,3	3,5

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
7	Forest fires management at regional and global levels	3	198	3,7	5,5
8	The use of prescribed burning in landscape management	3	126	2,3	3,5
Total chosen by university			1242	22,9	34,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Ecology of forest fires	2	126	2,3	3,5
2	Management of landscape fire regimes	2	126	2,3	3,5
Total selected by the students			252	4,6	7,0
Total number of elected part			1530	28,3	42,5
Master program "Forest-agricultural landscape study"					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training					
1	Optimization of forest-agricultural landscapes	3	162	3,0	4,50
2	Scientific basis of anti-erosion systems	3	144	2,7	4,00
3	Erosion science	2	144	2,7	4,00
4	Theoretical foundations of protective afforestation	3	162	3,0	4,50
5	Systems of soil protect from erosion	2-3	252	4,7	7,00
6	Hydro technical melioration	2	108	2,0	3,00
7	Reclamation of affected landscapes	2	126	2,3	3,50
8	Forest-agricultural landscapes	2	144	2,7	4,00
Total chosen by university			1242	23,1	34,50
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training					
1	Forest melioration of highways	2	126	2,3	3,50
2	Ordering of protective plantations	2	126	2,3	3,50
Total selected by the students			252	4,6	7,0
Total number of elected part			3240	60,0	90,0
Practical training			324	6,0	9,0
Writing and defense of master's thesis			324	6,0	9,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### *1.1. Cycle of social and humanitarian training \**

**Psychology of Management.** The purpose and main objectives of the course is to introduce Master of Management Psychology as a science that studies the patterns of management, the role of psychological factors in the management, psychological decision-making, methods of optimal use of knowledge about the structure of the individual, group dynamics, how accurate mastering, restoration and interpretation basic concepts of psychology of management, an effective competition and the application of management skills.

**Philosophy of Science.** Philosophy, its object, function and place in contemporary culture. Cognition as a subject of philosophical analysis. Variety of forms of knowledge. Features of scientific knowledge. Methods and forms of scientific knowledge. Philosophy of science, its genesis and development stages. Philosophy of science in the XX century. Theoretical models and laws of science. Ontological problems of modern science. Logical and epistemological problems of modern science. Axiological problems of modern science. Historical and philosophical questions: from antiquity to the present. Ontology.

Epistemology. Philosophy of Science, Logic and Methodology of scientific knowledge. Social Philosophy.

**Business foreign language.** Speech Etiquette of communication: language models salutation, civility, forgiveness, coordination and more. Linguistic and cultural aspects of international exhibitions. Grammatical and a minimum of linguistic communicative level presentations. Professionally-oriented foreign-language sources. Methods of finding new information in the foreign-language sources. Linguistic methods for analytical processing of foreign sources. The study of foreign language printed original literature and expansion of vocabulary and grammatical skills. Methods and linguistic features of annotation and summarization of foreign sources. Electronic foreign-language sources. Finding information on the Internet by using keywords. Fundamentals of Translation professionally oriented foreign-language sources. Machine translation of large volumes of foreign language information. Lexical minimum computer (information) technology.

### *1.2. Cycle of professional training \**

**Methodology of scientific research.** The concept of scientific knowledge, science, classification and basic science concepts of the content of research are expand. General information about the methodology and classification of research, especially research in the forest and methods used for this purpose are set out. The questions on planning and consistency of research students and young researchers working on the scientific literature are set out.

**Forest policy.** Basic concepts of the discipline. Subject, purpose and concept of forest policy. Levels of forest policy. Basic principles of forest policy. Components of forest policy. Aims and objectives of forest policy. Conditions, goals and objectives in Ukraine. Legislation in the field of social, financial and environmental law as instruments of forest policy. Forestry legislation. Forest Code of Ukraine. Analysis of the distribution of government functions in the forestry sector in Ukraine and ways of its reform. The main functions of the state. Strategic priorities of forest policy in Ukraine. Environmental, economic and social aspects of sustainable development. Criteria and indicators of sustainable forest management. The concept of sustainable development in Ukraine. The principles of sustainable forest management. Basic concepts and definitions of certification and forest certification. Features of forest policies of European countries.

### *1.3. Cycle of professional training \**

**Forestry production management.** Provides a systematic approach to the study of production management, mastery of organizational, functional and official regulation of the business of forestry, assessing personal and professional qualities of workers, developing creative approaches to reasoning and decision making, taking into account the specific characteristics and forest production.

**Forestry production planning.** Subject, method and objectives of the discipline. Basic principles and methods of planning in market conditions. The system plans that operate in the forestry industry. Methodology formation of tactical and strategic plans for forest production. Regulatory information management planning process. Analysis of the implementation plan of the enterprise for the last time. The product and its formation. Business planning for forest enterprises. Plan your work and wages in forest enterprises. Planning logistics for I / d plants. Planning costs of forest products in market conditions. Financial planning for forest enterprises. Features pricing and their bottom Forestry enterprise.

**Regulation of forest productivity.** The subject is studied after students have covered the tasks on the program issues in Silviculture, Forest Measuring, Forest Plantation, Forest and Hydro technical Melioration, Forest Selection and Genetics, that

enables them to solve comprehensively the problem of forest productivity and improving their quality. In the course underlined the notion productivity and its kinds, nature of wood productivity, and the ways of its increasing by both silviculture and reforestation methods and also genetics and selection base.

**Labor protection** . Legislation in labor protection . Fundamentals of occupational health and industrial hygiene. Providing first to medical care. Providing healthy working conditions in forestry.

**Information technologies in forestry.** The subject aims to study the basic information tools for forest management and processing information for decision-making. Working with databases, standard office applications, network tools, database "forest management".

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional training\**

**World forestry and world forestry resources.** Subject reveals the history and traditions of world forestry and silviculture and their current status in different countries and on different continents. Main focus of study reveals on Eastern Europe, where formed the origins of modern forestry in Ukraine. Modern priorities of forestry under anthropogenic pressure and the need for forest conservation are studied. The main types of the world's forests and their distribution by continents, the main types of forest resources and historical features of their use, the history of the formation and transformation of silvicultural systems based on socio-economic conditions, the main international organizations dealing with forests, decisions and resolutions of international forest forums and forest implementation of regional and global forest policy are considered.

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional training\**

#### *Production oriented disciplines*

### **Master program "Silvics and practical silviculture"**

**Forest logging.** Technology of the upper warehouses, loading and unloading at upper warehouses in the plains and mountains conditions. Lower warehouses: organization of work at lower landing. Vehicles and transportation: optimization of the parameters of the vehicle. Downloads of wood to wagons. Technology and rules. Export of products.

**Forest roads and forest vehicles.** Study course «Forest roads and forest vehicles" forms the scientific knowledge concerning the design, construction and maintenance of forest roads and vehicles, which can effectively solve the problem of reforestation, forest protection organization of forest management and apply their received skills in practice .

**Forestry commodity.** The structure of wood, its physical and mechanical properties. Defects of wood. Properties, methods of drying and storage of timber. Accounting, sorting and labeling. Requirements for materials.

**Wood processing.** Methods for mechanical processing of wood. Elementary cutter. Wood cutting resistance, strength and power of cuts. The main types of woodworking machines. Wood on lower warehouses and woodworking shops.

**Game science (hunting).** The history of hunting and game management. Systematics and biology of game species. Game management. Hunting ordering, inventory and bonitation of hunting grounds. Methods and tools for hunting wildlife. Types of hunting products. Wildlifebreeding. Fur farming and commodity study. Breeding of

hunting dogs. Hunting legislation. The Nature Conservation and protection. World practice, economics, organization and planning of game management.

**Forest tapping.** Knowledge of the: anatomic structure of resinaceous system, properties of resin and processed products, stimulants for improving receiving of resin, tools and accessories for tapping work, tapping techniques and technology, technology of chemical processing of wood, resin and pine needles.

**Forest Ecology and typology.** The study of forest ecology the necessary theoretical knowledge of forest ecology and skills for management and restoration of forest ecosystems has formed. The basic concept autecology synecology and the impact of environmental factors on forest ecosystems are studied. The need for ecological approaches to studying the nature of the forest is reveals. Ecological principles approach to the study the processes of formation of forests, forest care outlined the concept of forest typology, its development and use for the purposes of science and practice are emphasizes.

**Increasing the productivity of forests by forestry methods.** Based on in-depth study of the formation of organic substances in woody plants the of ways silvicultural effect on the activation of growth processes to improve wood productivity of forests and improve the quality of future stands are considered. The place of forestry sciences of Ukraine in international structures is studied.

**Industrial methods of forest growing.** Potential productivity of forest plantation and selection of woody plants, optimizing of habitat conditions and principles of organization of forest plantations, regional technology of conifer plantations of forest woody plants and regional technology of plantation of forest deciduous woody plants are studied.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional training \**

**Non-wood products and adverse use of forests.** *Types of non-timber forest products and methods of rational utilization and ways to improve the quality and productivity of forest fruit plants, medicinal plants, grasslands, methods of harvesting discipline are studying.* The extraction technology of birch sap and growing forest fruit plants on plantations are considered. Honey plants and their resources and the ways to increase it amount in the forests of Ukraine are studied.

**Biological bases of thinning.** Mechanism of thinning stands and it influence to change lighting and microclimate in forests that has a positive effect on physiological processes in woody plants, their growth and development are reveals.

## *2.1. Disciplines chosen by University*

### *2.1.1. Cycle of professional training*

### **Master program “Forest Protection”**

**Forest pathology.** The theoretical principles of infestation and biological protection from pathogens are examined. The discipline reveals genetic interactions between host plant, pathogen and environment.

**Mathematical modeling pest and pathogen populations.** Types of mathematical models. Technological stages of mathematical modeling. Theories of mass reproduction of pests and pathogens. Regulatory mechanisms of population dynamics. Forest stands resistance, pathogen dynamics, and correlation analysis.

**Forest nematology.** Morphology, biology, ecology and systematics nematodes. The relationship of nematodes in plant groups. Nematodosis in tree crops and nurseries. Useful nematodes. Antinematodes measures in forest protection.

**Technology integrated protection.** Forest protection enterprises and their goals. Forest pathology control. Pestaccounting and population forecast. Forest entomology



examination. Forest entomology monitoring. Planning forest protection operations and assessing their effectiveness. Forest quarantine. Mechanical, physical, biological, chemical, and genetic methods. Bacterial, fungal and viral agents. Antibiotics.

**Diagnosis of pests and pathogens.** Diagnosis of tree and shrub diseases. Configuration and usage of different instruments and tools. Methods for various diagnostic analyses.

**Woody plants immunity to pathogens.** Passive and active natural immunity. Methods of artificial propagation of active biological resistance of woody plants. Methods of hybrid woody plant development and their evaluation .

**Forecast of pathogens and pests.** Forecast of pathogens and pests. Short-term and long-term forecasts for major pathogens and pests for the main of timely introduction of prevention and control measures.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional training\**

**Bacterioses of forest tree species.** Plant pathogenic bacteria in general forest pathology. Morphological, biological, physiological and cultural characteristics of bacteria. Classification and taxonomy of bacteria. Reproduction and dissemination of bacteria in nature. Bacterial diseases of forest plantations.

**Mycotrophy of woody plants.** Structure, nutrition, growth and development of fungi. Technology of mushroom cultivation. Protection of mushrooms against pests and pathogens.

## *2.1. Disciplines chosen by University*

### *2.1.1. Cycle of professional training\**

#### **Master program “Regeneration and propagation of the forest”**

**Modern technologies of nursery.** Growing of planting-stock with the closed rootage. Container growing of propagating material. Experience of nurseries creation abroad.

**Microclonal propagation of woody plants.** Morphogeny and regeneration in vitro. Making healthy arboreal plants. Adaptation of plants-regenerated.

**Forestry methods of rehabilitation of the technogenic-broken earth.** Technogenesis. Regional and technological features of creation of the forest planting on earth, that tested contamination. Features of creation of the forest planting on earth, that tested technogenic influence.

**Forest plantations.** Possible productivity of forest plantations and selection of arboreal plants. Optimization of terms of habitat and principles of organization of forest plantations. Regional technologies of creation of coniferous arboreal plants forest plantations. Regional technologies of creation of leafy arboreal plants forest plantations.

**Ecological bases of reforestation and afforestation.** Factors are mechanisms and conformities to law of forming of forest cenosiss. Biocenotic succesions of forest structures cultivated area. Silvicultural and ecological districting of Ukraine. A recreation of forest cenosiss is in different cultivated areas. A recreation of forest cenosiss is on unforest earths. Ecological rehabilitation of the broken earths by silvicultural methods.

**Increase of the productivity of the forests by forestry.** The silvicultural methods of the productivity increase of the forest planting are considered due to the improvement of forest cultures, application of fertilizers, and also due to the reconstruction of the low-value stands, creation, under tent cultures and by production of introducentiv.

**Forestry sort study.** Modern normative and legal base of high quality forest seed. Organization of seed base. Temporal, permanent seed areas and archival-pestle plantations. Measures of improvement and stimulations of seed are on permanent forest

seed nurseries objects. Methods of defense of harvest of forest seed are from wreckers and excitors of illnesses.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional training \**

**Forest plants of green belts.** Classification and principles of forming of the forest-park planting. Composition principles of forming of the forest-park planting. Silvicultural methods of improvement of sanitary-hygenic properties of forest-park objects. A landscape reconstruction in the suburban forests.

**Application of fertilizers in forestry.** Theoretical principles of the use of fertilizers. Modern types of fertilizers are their description and features. Choice of fertilizers and determination of doses of their bringing. The systems and features of application of fertilizers are on the objects of permanent seed base, in nurseries, forest planting and forest plantations. An estimation of forestry efficiency and ecofriendliness of application of different types of fertilizers in forestry.

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of professional training \**

**Master program “Management of forest resources and forestry business”**

**Management of forest resources.** Description and main features of management of forest resources and forestry businesses. The economic risks associated with the management of forest resources and forest business. Management of forest resources in crisis situations. Management of forest resources on the basis of sustainable development. Management of forest resources in the natural reserve fund. Conflicts in forest use: theory and management. Strategic management in forestry: theoretical foundations and features.

**Forest commodity science.** Structure of wood, its physical and mechanical properties. Defects of wood. Properties, methods of drying and storage of timber. Accounting, sorting and labeling. Requirements for raw materials.

**Information systems in forestry.** The subject aims to study main information tools for acquiring forest management information and its processing for decision-making support. Work with databases, standard office applications, network tools, database management system "Forest resources management".

**Finances.** Theoretical Foundations of Finances. Historical aspects of finances origin and development. System of National Accounts. Financial System of Ukraine. Theoretical basis of enterprise' finances. Money receipts and expenditures of forestry enterprises. Settlement of forestry enterprises. Taxation of forest enterprises. Theoretical basis of origin and circulation of money. The role and function of credit in financial system.

**Economics of nature use.** Involves study of causes of ecological and economic problems, setting goals and priorities of sustainable development of different areas of environmental management, environmental and economic substantiation of efficiency of management decisions in environmental management, mastering economic evaluation of natural resources, practical skills in formation and use of environmental policy instruments in framework of economic mechanism of nature use.

**Foreign trade in forest sector.** The main purpose of discipline is: studying theoretical foundations in area of foreign trade in forestry sector, and to develop practical skills and ability to apply the acquired knowledge in export-import operations on enterprises of forest sector. The main areas of learning material are: legal principles of foreign trade and business activities in the forest sector, theoretical and practical bases of foreign investment in the forest sector of Ukraine and choice of organizational forms of foreign investment, issues of justification and choice of forms and methods of entering foreign markets; procedure of concluding external contracts, their features in forestry, planning, control and reporting in foreign trade in forestry.

**GIS in forestry.** Modern computer systems. Methods for collection, transmission and use of information. Industry data banks. Information and functional patterns of production, storing and use of information resources. Modern geographic information systems. Geographic coordinate system. Fundamentals of Databases. Data Structures and data models. Technology for data entry. Analysis of spatial data. System for collecting and processing data - Field-Map.

**Forest Productivity Modeling.** Classification of models. Modeling as the main process of study of forest objects. Criteria for optimal stands. Development of regression models using modern mathematical methods. Peculiarities of development of models of dynamics and prognosis. Modeling growth functions with modern computing techniques. Planning of active experiment. Development of mathematical models using full and partial factor plans. General knowledge on numerical methods for solving optimization tasks.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional training*

**Marketing in forestry.** Socio-economic nature of marketing. Features of marketing activities on forest enterprises. Marketing research as a basis for adoption of marketing decisions. Functions of marketing (analytical, production, sales, management and control). Marketing planning on forest enterprises. Financial aspects of marketing.

**Computer technology in forestry.** Effective work with documents in MS Word, practical application of tabular processor MS Excel: approximation of dependences, analysis and optimization, tasks of linear programming; preparation of charts in Visio system, use of statistical software package SPSS.

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of professional training*

**Master program “Methods of entomological control in crop and nature”**

**Biocenology insects.** Study groups of insects, patterns of functioning of their communities and the diversity of species and value in ecological niches of different types of natural and geographical conditions for ecosystem likes and allelopathy is important both in theoretical and in practical terms.

**Methodology and technical support of advanced entomological research.** Diagnosis of Diseases of the forest by microscopic symptoms and signs mycological surveillance and mycelium growth in pure culture. Determination of pests and diseases by physical and chemical methods. Character coloring agents and diseased wood rot.

**Phytosanitary and environmental assessment.** Phytosanitary inspection is part of the state system of pest control in Ukraine. Study of measures aimed at protection of the territory and population health from entering Ukraine from abroad quarantine and other dangerous pests, pathogens, plants and weeds that can cause significant damage to the national economy of Ukraine.

**System analysis of environmental quality and crop production.** The study of the changes in consumer qualities of crop production, the study of science, which makes systematic theoretical and practical study of remote sensing, rapid analysis of natural objects, the influence of various factors on the quality of agricultural products and environmental protection problems. Development of technologies preprocessing and storage of plant products, which provide maximum yield and high quality all the way move it from field to consumer.

**Quality management of the laboratory.** Shape future professionals complex knowledge of the basic principles, categories, methods and tools of quality management in modern laboratories, summarizing the main achievements of the theory and practice in the field of quality management, to show the need for these achievements in all areas of the

laboratory, to form an idea of the systematic organization of management quality lab that meets international standards.

**Monitoring of entomopathological complex.** We offer modern instrumental methods of pest monitoring forest park spaces. As a result of the complex species identification of the dominant species of herbivores, as a result of formation thresholds of their number and harmfulness. On this basis, proposed a set of original technological methods of protecting plants from the forest park dominant herbivores and pathogens.

**Control of entomopatological complex.** Given priority technologies which include biological methods of plant protection, including resettlement laboratory cultures - species of trichogramma and habrobrakon trees. Also proposed a set of methods aimed at the preservation, collection and settlement of natural populations of entomophagous.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional training\**

**Forecast of pathogens and pests.** Short-term, long-term and long-term forecasts for major pathogens and pests, for the purpose of timely prevention and control measures to combat them.

**Laboratory studies in entomology.** Gaining practical skills in conducting laboratory experiments, practical skills and abilities that are necessary for the independent exercise entomological research in the laboratory and in the sanitary-epidemiological stations, stations protect plants and trees from pests.

**Entomopathological expertise.** Methods and techniques of diagnosis of pathogens and damage their identification.

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of professional training\**

**Master program “Forest melioration”**

**Inventory of protective plantations.** Basics ordering protective plantations. Legal basis of regulation of protective vegetation. Agroforestry regulation of protective forest plantations on agricultural lands. Contemporary forest management.

**Erosion science.** The concept, classification and categories of soil erosion. Water erosion: ancient and modern, factors of development, physical properties and erosion of rain, runoff energy structure. Wind erosion (deflation) dust storms. Prediction of erosion modeling of deflation. Research. Erosive zoning. Methods and properties of eroded soils. Justification zone of erosion.

**Forest land reclamation.** Objects and types of land reclamation. Forestry of disturbed lands. Value of bioecological characteristics of trees and shrubs species for forest restoration. Technology of plantation establishment on disturbed lands. Ecological and economic aspects of forest land reclamation.

**Forest-agricultural landscapes.** Forest and field. Structure of forest-agricultural landscape. Features of protective forest plantations on agricultural land.

**Systems of erosion soils control.** Rationale for zonal systems. The system measures against water erosion: organizational and economic, agronomic and agroforestry, hydraulic measures. The set of measures to combat wind erosion (deflation). Erosion in mountainous areas and measures to combat it. Features of zonal systems. Economics and Organization of works to protect the soil of erosion.

**Optimization of forest-agricultural landscapes.** Crop rotations and farming systems. Land Management and agroforestry ordering. Organization of erosion area. Agroforestry plantations in the structure of FAL - types, placement, efficiency. Forest area. Principles of creation of FAL. The criterion of optimality, optimization model FAL. System of normative reference data for assessing environmental and economic efficiency of FAL.

**Zonal anti-erosion systems.** Rationale for zonal systems. The system measures against water erosion: organizational and economic, agronomic and agroforestry, hydraulic. The set of measures to combat wind erosion (deflation). Erosion in mountainous areas and measures to combat it. Features zonal systems. Economics and Organization works to protect the soil from erosion.

**Protective afforestation.** The theoretical justification for the use of protective plantations. Features water erosion and deflation of soils and expression of harmful climatic effects. Shelter afforestation. Protective afforestation as part of the zone of erosion. Agroforestry plantations on sand, in the mountains, on reclaimed lands and waterways transport.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional training\**

**Protective plantations in the ways vehicles.** Experience the protective afforestation in the ways vehicles. Types of protective forest plantations, their properties and accommodation. Forms snow deposits. Categories of snow accumulation ways of transport. Design of protective forest plantations in the ways of transport. Cost-effectiveness of afforestation in the ways vehicles.

**Hydrotechnical reclamation.** Environmental aspects hydrotech meliorationi. Key elements of hydrology, hydraulics and hidrometriyi. Irrigation and water supply. Drainage of forest lands. Irrigation. Irrigation regime. Irrigation system. Salinization of soils and how they demineralized.

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of professional training \**

**Master program "Forest inventory"**

**Special types of forest mensuration.** The main concepts of special types of forest mensuration, their goals and tasks. Basics of recreational and reserved forest management. Urban forest inventory. Inventory of protection forests and forest belts. Peculiarities of mountain forest management. Hunting lands management. Basis of national forest inventory. Modern technology of cameral work of forest survey. Forest inventory abroad.

**Forest monitoring.** Organization of systematic observation on forest health in Ukraine. Methods of forest monitoring. Methods of control on forest ecosystem changes. Structure of information in management system "Forest Fund of Ukraine". Relation between continuous forest survey and forest monitoring.

**Special types of forest inventory.** Subject is studied after course "Special types of forest mensuration" which is base of the discipline. The course provides specifics of management of forest green zones, National parks, protected forests on agricultural lands and hunting lands. It also presents modern methods of forest inventory including that is used abroad.

**Information systems in forestry.** The course deals with studying main resources of forest information and methods of its processing to make right decision. Work with data bases, office programs, network, database "Management of forest resources".

**GIS technology in forestry.** The goals of the discipline are: to get skills and experience in database design and support, automated mapping of forest stands, spatial analysis of different processes in forestry, decision making support in forest management. Introduction to modern methods and technologies of forest inventory and monitoring which are based on novel tools, equipment and software for forest mensuration.

**Modeling of forest productivity.** Classification of models. Modeling as a key tool in forest research. Optimal forest stands criteria. Development of multiple regression models by means of modern mathematical approaches. Dynamic growth model which are used in forestry. Modeling of growth functions using computer technologies. Experiment

---

planning. Mathematical models development using factorial design. Introduction to methods of solving of optimization tasks.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional training\**

**Environmental economics.** The subjects of study are ecological and economic problems in the sphere of natural resources usage, definition of current priorities and goals of sustainable development, determination of effectiveness of decision making, gaining experience of economical assessment of natural resources, study of instruments of ecological policy.

**Computer technologies in forestry.** Course deals with study of effective work with documents of MS Word, examples of MS Excel table processing (modeling of relation, analysis and optimization, linear programming tasks), scheme design in Visio, application of statistical program SPSS.

*2. 2. 1. Disciplines chosen by University*

*2.1.1. Cycle of professional training \**

*Research oriented master program*

**Master program “Biological and energy productivity of forest plant communities (Phytocenosis)”**

**Forest monitoring.** Principles of classification of ecological monitoring system. Monitoring impact of anthropogenic factors on the environment. Organization of observations of natural environment. Monitoring of forests in Ukraine and its features. Main functions and organization of forest monitoring system in Ukraine. Organizational structure of forest monitoring in Ukraine. Methods of monitoring area establishment. Assessment of defoliation, and damage on trees within monitoring plots. Monitoring and sustainable management of forests. Radiation monitoring of forest ecosystems on example of DSKP "Chernobyl Pushcha". Monitoring of carbon dynamics in forestry. Forest monitoring of carbon dynamics. The role of geographic information systems (GIS) for purpose of environmental monitoring. Forest Monitoring and national inventory using modern technologies. Aerospace monitoring of forests.

**GIS-technologies in forestry.** The main aim of the discipline is: acquiring knowledge and abilities on creation and supervision of data banks (information support function), automated mapping (creation of maps, plans of forest stands), spatial analysis of natural, natural and management processes, decision-making support in planning, and management. Study of modern methods and technologies for forest ecosystems inventory and monitoring on basis of advanced measurement technologies, devices, tools and software.

**Modeling of forest productivity.** Classification of models. Modeling as themain process of study of forest objects. Criteria for optimal stands. Development of regression models using modern mathematical methods. Peculiarities of development of models of dynamics and prognosis. Modeling growth functions with modern computing techniques. Planning of active experiment. Development of mathematical models using full and partial factor plans. General knowledge on numerical methods for solving optimization tasks.

**Forest inventory and cadaster.** Content and objectives of statistical forest inventory. Methods of forest inventory operations. Instrumental and technical support for forest inventory. Initial forest inventory and state forest cadastre. Monetary valuation of forests.

**Databanks of forestry information.** Background of creation and main advantages of databanks. Basic theoretical concepts. Structure of databases. Stages of database design. Info logical modeling of domain for which the database is created. Concept of Data

Storages and preconditions of their creation. Designing relational databases. Datological design. Developing a database model using tools of a specific database management system

**Information systems in forestry.** The subject aims to study main information tools for acquiring forest management information and its processing for decision-making support. Work with databases, standard office applications, network tools, database management system "Forest resources management".

**Economics of nature use.** Involves study of causes of ecological and economic problems, setting goals and priorities of sustainable development of different areas of environmental management, environmental and economic substantiation of efficiency of management decisions in environmental management, mastering economic evaluation of natural resources, practical skills in formation and use of environmental policy instruments in framework of economic mechanism of nature use.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional training \**

**Biological productivity of forests and its components.** Methodology and methods of research. System approach and mathematical modeling in study of forest sites. Basic definitions of components of biotic productivity of forests. Live biomass as an object of research. Research of biotic productivity of trees and stands in Ukraine. Density and content of bone dry matter in fractions of live biomass of trees. Problems of inventory of greenhouse gas emissions in forest sector.

**Computer technology in forestry.** Effective work with documents in MS Word, practical application of tabular processor MS Excel: approximation of dependences, analysis and optimization, tasks of linear programming; preparation of charts in Visio system, use of statistical software package SPSS.

## *2.1. Disciplines chosen by University*

### *2.1.1. Cycle of professional training\**

#### **Master program “The theoretical basis for monitoring and reducing the risk of forest fires” (Wild fires management)”**

**Use of GIS for modeling and predicting of forest fires.** The main purpose of discipline is: the acquisition of knowledge and skills of creating and maintaining databases (informational function), automated mapping (creation of maps, plans, plates of forest), spatial analysis of natural and management processes; decision support in planning, designing and management. Introduction to modern methods and technologies of inventory and monitoring of forest ecosystems based on advanced measurement technologies, devices, tools and software.

**Forest fires behavior.** The evaluation of site conditions, topography, forest fuel materials and weather conditions as factors of the fire environment that allows us to understand the nature of fire behavior are considered. The conditions of formation and development of forest fires, as well as methods of predicting the behavior of forest fires are studied.

**Forest fuel materials.** We consider the classification of plant fuel materials, mapping of forest fuel materials (FFM), the practical use of maps of FFM to evaluate fire hazard, mapping methods of FFM, choose of the minimum number of features needed to predict the behavior of ground fires, compilation of large scale map of LGM, methods to predict mortality in after fire stands.

**Influence of weather conditions on forest fire hazard.** The influence of weather conditions on fire hazard in the forest, a comprehensive assessment of the impact of weather conditions on fire safety, methods for determining the degree of fire hazard by weather conditions and the effectiveness of various meteorological parameters.

**Organization of forest fire protection.** Consider the protection of forests from fires, strategies of forest fire fighting and organization of operative suppression of forest fires consequences, from the study of forest fire prevention and finishing with methods of fire fighting in the forest and suppression of forest fires consequences. At the same time ways of using fire-fighting equipment, communications equipment, aircraft and fire fighting in the forest are studied.

**Strategies of forest fire fighting.** The planning and organization of firefighting, strategy, tactics, logistics and technical means of protection are considered. The stages of fighting forest fires, the factors affecting the success of extinguishing equipment used to extinguish the procedure for interagency coordination of fire, providing logistics and interaction on fire are studied.

**Management of forest fires at regional and global levels.** Discipline taught after students working on forest policy and management of landscape fire regimes, which allows to understand the current strategy for fighting fires, fires global assessment, international cooperation, to better understand the main causes of fires, the need for environmental and human consequences of the fires, expand cooperation and integration policies, plans, implementation and monitoring of various sectors of international development policy and fire protection systems.

**The use of prescribed burning in landscape management.** The planning of prescribed burnings, phases of its providing and most important causes, the tools used in prescribed burnings, the procedure of the preparation and approval of plans for legal prescribed burnings are presented in the course.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional training \**

**Fire ecology.** The impact of forest fires on the components of forest ecosystems, predicting the state of forest plantations in the next few years after a fire, and the impact of forest fires on natural forest regeneration and changes that take place in forest succession are considering.

**Management of landscape fire regimes.** Discipline taught the department of Fire regimes of landscapes, preservation of stable, well-functioning of ecosystems, management strategy firefighter's modes: the dynamics of fire behavior prevent undesirable ignition, reducing the risk of fires.

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of professional training\**

**Master program "forest-agricultural landscape study"**

**Optimization of forest-agricultural landscapes.** Crop rotations and farming systems. Land Management and agroforestry ordering. Organization of erosion area. Agroforestry plantations in the structure of FAL - types, placement, efficiency. Forest area. Principles of creation of FAL. The criterion of optimality, optimization model FAL. System of normative reference data for assessing environmental and economic efficiency of FAL.

**Scientific basis of anti-erosion systems.** Theoretical Foundations agroforestry and erosion zoning of Ukraine. Principles of zonal systems protect the soil from erosion. Scientific basis of environmental and economic optimization of zonal forest-agricultural ecosystems.

**Erosion science.** The concept, classification and categories of soil erosion. Water erosion: ancient and modern, factors of development, physical properties and eroziynist rain runoff energy structure. Wind erosion (deflation) dust storms. Prediction of erosion modeling deflation. Research. Erosive zoning. Methods and properties of eroded soils. Justification zone of erosion.

---



**Theoretical Foundations of protective afforestation.** History. Adverse climatic phenomena. Shelter afforestation: agroforestry and forest zoning species, the impact of field shelterbelts on land, their location, design, circuit mixing technology creation, thinning, special purpose belts. Erosion and system events. Forest mountain melioration. Reclamation of sands. Shelterbelts in the ways vehicles.

**Systems protect the soil from erosion.** Rationale for zonal systems. The system measures against water erosion: organizational and economic, agronomic and agroforestry, hydraulic measures. The set of measures to combat wind erosion (deflation). Erosion in mountainous areas and measures to combat it. Features of zonal systems. Economics and Organization works to protect the soil from erosion.

**Hydrotechnical reclamation.** Environmental aspects of hydrotechnic melioration. Key elements of hydrology, hydraulics and hidrometriyi. Irrigation and water supply. Drainage of forest lands. Irrigation. Irrigation regime. Irrigation system. Salinization of soils and how they demineralized.

**Reclamation of man-made landscapes.** Features of site conditions on lands designated in the reclamation and their types. Experience and species restoration. Classification and characterization of breeds suitability for biological reclamation. Specific design for each facility, technical and biological reclamation stages. Create afforestation (general purpose, field shelter belts, reclamation, erosion, landscape planting, forest parks, in the streets after peat).

**Forest-agricultural landscapes.** Definition of forest-agricultural landscape (FAL). Block diagram of the FAL. Elements of FAL. Erosion funds. Principles of Agronomy. Crop rotations and farming systems. Land Management. Organization of erosion area. Agroforestry plantations in the structure of FAL - types, placement, efficiency. Forest area. Principles of FAL. The criterion of optimality, optimization model FAL. System of normative reference data for assessing environmental and economic efficiency of FAL.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional training \**

**Forest melioration of highways.** The value and location of protective afforestation (ZLN) on ways of transport. History and experience of protective afforestation transport. Types ZLN, their parameters and accommodation. Forms snow conditions for the formation of sediments and drift. Categories of snow deposits of transport. Specifications designing of snow-protected forest plantations. Design of ZLN transport - structure, design, selection of species, circuit mixing technology creation. Caring for plants and their conservation. Cost-effectiveness of afforestation on transport.

**Organize of protective plantations.** Basics ordering protective plantations. Legal basis of regulation of protective vegetation. Agroforestry regulation of protective forest plantations on agricultural land. Contemporary forest management.

---

**Master training  
in specialty “WILDLIFE SERVICE”  
Branch of knowledge “Agriculture and Forestry”**

**Form of training, licensed number of students:**

- Full-time** 25
- correspondence**

**Term of study** 1,5 year

**Credits** 90 ECTS

**Language of teaching** Ukrainian

**Qualification of graduates** master's degree in Wildlife service

**The concept of training**

Nowadays, under conditions of sustainable management of all sectors of Ukraine's economy, the most urgent problem is a complex approach to the conservation of natural resources. An integral part of this problem is the forest management as well as wildlife resources preservation including a separate form of human's activity - game management. The successful management and development of this industry provides us with an important and a very attractive element of our life and activity. As every branch of economy it needs an appropriate infrastructure and skilled specialists.

**Production oriented master program**

***Master program “Wildlife service”***

The program focuses on the development of professional knowledge to manage populations and habitats for game animals, conservation and sustainable use of game animal resources, evaluation and optimization of hunting grounds.

**Sphere of graduates employment**

Post-graduates are employed in such enterprises: state forestry and hunting enterprises of the State Agency of Forest Resources of Ukraine (as forest ranger, chief forest ranger, forestry engineer, forest protection engineer), State forest protection association (forest pathologist, chief forest pathologist), Ukrainian center for training, retraining and advanced training in forestry, associated higher education institutions of I-IV accreditation levels, zoological parks and Nature Reserve Fund institutions, Forestry Project Institute", Ministry of Ecology and Natural Resources of Ukraine (researcher positions).

**Practical training**

Bases for practical training are: educational, scientific, educational and industrial laboratories of the Institute's departments and "Boyarka Forest Research Station", Subdivision of NULESU, Botanical Garden of NULES of Ukraine and leading forestry enterprises of the State Agency of Forest Resources of Ukraine.

**Proposed Topics for Master Theses**

1. Means and prospects of development of hunting and wildlife management on the lands of natural reserves.
  2. Formation of a population of ungulate game species in forestry hunting enterprises and its regulation.
  3. Approaches to improve biotechnical activities in forestry hunting enterprises.
  4. Problems and perspectives of bats' habitat conservation in forestry hunting enterprises.
-

**MASTER DEGREE PROGRAMS**

5. Game population increase and means for its maintenance in forestry hunting enterprises.
6. Comparative aspects and prospects of hunting in the forest-steppe zone.
7. Current state and characteristics of hunting and wildlife management in forestry hunting enterprises.
8. Current state and approaches to organizing hunting and wildlife management in Kyiv region.
9. Peculiarities of breeding hunting animals taking into account the balance of the forest ecosystem.
10. Technology of keeping and breeding ungulates in Polissia region.

**Academic rights of applicants for a master program**

In addition to the specialty “Wildlife service” applicants with a Bachelor’s degree in the field of “Forestry and Garden-Park Management” can receive the degree in the field of **“Agriculture and Forestry”**:

- 8.09010301 “Forestry” (see p. 275);
- 8.09010303 “Park and Gardening Management” (see p. 301);

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”, (see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Wildlife service”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Labor protection	2	108	2,0	3,0
2	Philosophy of Science	1	108	2,0	3,0
3	Civil protection	1	126	2,3	3,5
4	Foreign language (for professional purposes)	2	108	2,0	3,0
5	Pedagogy and teaching methods in higher education	3	90	1,7	2,5
<i>Total number</i>			<i>540</i>	<i>10,0</i>	<i>15,0</i>
<i>1.2. Cycle of mathematical, natural and scientific training*</i>					
1	Methods of research	1	108	2,0	3,0
2	Information technology in game management	1	126	2,3	3,5
<i>Total number</i>			<i>234</i>	<i>4,3</i>	<i>6,5</i>
<i>1.3. Cycle of professional and practical training *</i>					
1	Management and marketing in wildlife service	3	90	1,7	2,5
2	Population management	2	108	2,0	3,0
3	Rational use and optimization of hunting grounds	3	90	1,7	2,5
4	Innovative technologies in game management	2	144	2,7	4,0
5	Hunting and environmental law	3	90	1,7	2,5
6	Breeding and selection of wildlife animals	1-2	216	4,0	6,0
7	Range management of wild ungulates	3	126	2,3	3,5
8	Standardization and certification of hunting	3	90	1,7	2,5

## MASTER DEGREE PROGRAMS

	products				
9	Re-acclimatization and resettlement of game animals	1	108	2,0	3,0
<i>Total number</i>			1062	19,8	29,5
Total according to regulatory part			1836	34,1	51,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
Master Program "Wildlife service"					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional and practical training</i>					
1	Zoogeographical and hunting zoning	1	108	2,0	3,00
2	Immobilization and transport of animals	2	108	2,0	3,00
3	Hunting resources of Ukraine and the world	1	108	2,0	3,00
4	Regional game management industry in Ukraine	3	90	1,7	2,50
5	The evolution of the animal world	2	108	2,0	3,00
<i>Total chosen by university</i>			522	9,7	14,50
<i>2.2. Disciplines chosen by students</i>					
<i>2.2.1. Cycle of professional training</i>					
1	Hunting tourism	2	90	1,7	2,50
2	Zoo management	3	144	2,7	4,00
<i>The total number selected by the students</i>			234	4,4	6,5
<i>Total number of elected part</i>			756	14,1	21,0
Practical training			324	6,0	9,0
Writing and defense of master's thesis			324	6,0	9,0
Total for specialty			3240	60,0	90,0

\* Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### Annotations of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### *1.1. Cycle of humanitarian, social and economic training\**

**Labor protection.** Legislation on health. Fundamentals of occupational health and industrial hygiene. Providing first to medical care. Providing healthy working conditions in forestry.

**Philosophy of Science.** Philosophy and its object, the function and place in contemporary culture. Knowledge as a subject of philosophical analysis. Variety of forms of knowledge. Features of scientific knowledge. Methods and forms of scientific knowledge. Philosophy of science, its genesis and development stages. Philosophy of science in the XX century. Theoretical models and laws of science. Ontological problems of modern science. Logical and epistemological problems of modern science. Axiological problems of modern science. Historical and philosophical questions: from antiquity to the present. Ontology. Epistemology. Philosophy of Science, Logic and Methodology of scientific knowledge. Social Philosophy.

**Civil protection.** Common patterns of occurrence and development hazards emergencies. Their properties, the possible impact on human life and zdorov'ya. Safety in emergencies. Organization and management of Safety.

**Foreign language (for professional purposes).** English terminology in hunting industry. Derivation of model phrases. Verb participle. See, The. Adjective, the comparison. Pronoun. Adverb. Preposition and conjunction. The use of time and how clause. Listening. Methods and linguistic features of annotation and summarization of foreign sources. Electronic foreign-language sources. Finding information on the Internet by using keywords. Fundamentals of Translation professionally oriented foreign-language sources. Machine translation of large volumes of foreign language literature.

**Pedagogy and teaching methods in higher education.** Scientific concept of pedagogy as a science, methodological foundations, main categories, the field of pedagogy, methods of educational research, the nature of the learning process, its drivers' forces didactic principles, forms and methods of training and education, types of education, educational technology.

*1.2. Cycle of mathematical and natural and scientific training \**

**Methods of research.** Scientific topics of research schemes of their conduct. Making scientific documentation. Selection of animals for experiments and their distribution in groups. Development of methodology and organization of research. Settlements area of hunting grounds, food supply, land productivity, species and quantities of game animals. Math (biometric) data processing. Justification of the research results and conclusions. Literary execution of scientific work (qualifying master thesis, scientific articles, abstracts, etc.). Expand the concept of scientific knowledge, science, classification and basic science concepts to the content of research. Set out general information about the methodology and classification research, especially research in the forest and methods used for this purpose. The questions on planning and consistency of research students and young researchers working on the scientific literature.

**Information technology in game management.** Possibilities of modern databases and data warehouses to assess the current status and planning hunting economy. Statistical and mathematical software packages for assessment, prediction and simulation of hunting economy. The use of relational databases and GIS systems for the assessment of hunting.

*1.3. Cycle of professional and practical training \**

**Management and marketing in game management.** Functions, principles and methods of effective management in hunting enterprises. Strategic management. Static and dynamic methods of investment project analysis in hunting. Personnel management in hunting enterprises.

**Population management.** Planning of hunting grounds, developing of breeding plans and managing population dynamics of game animals. Managing game populations in intensive and extensive hunting enterprise types. Selective exclusion of unwanted genotypes from game populations.

**Rational use and optimization of hunting grounds.** Program development and implementation to improve the quality of hunting grounds while accounting for recreation use, in cooperation with forestry and agricultural enterprises.

**Innovative technologies in game management.** Using modern databases to analyze and achieve hunting and wildlife management goals. Programs remediation and reclamation of hunting grounds. Contemporary breeding technologies suitable for keeping and breeding of game animals in natural and artificial environments. Genetic methods and cryobiology. Statistical and mathematical software packages for assessment, prediction and forecasting of hunting and wildlife.

**Hunting and environmental law.** Hunting regulations and environmental legislation. Hunting land allocation agreements and other contracts. Penalties. Organization of public hearings.

**Breeding and selection of game animals.** Genetic parameters identification and patterns inheritance of economically useful traits for game animals. Karyotype and immunogenic identification of game animals. Optimal breeding technology of game animals in captivity. Selection of genetic material and hybridization to generate new genotypes. Hatching technology for game birds, and their management.

**Range management of wild ungulates.** Assessment, prediction and forecasting. Program for creating range facilities and shelters for breeding, rearing and keeping of

game animals in semi-captivity. Technology of keeping and breeding ungulates for trophy and meat production purposes.

**Standardization and certification of hunting products.** Standards for hunting products and their certification. Licensing actions for hunting products. Control of hunting products for compliance certification.

**Re-acclimatization and resettlement of game animals.** History, population and habitat of acclimatized and re-acclimatized game species of the fauna of Ukraine. Examples of successful and unsuccessful acclimatization, based on biological and economic results. Methods for acclimatization, re-acclimatization and resettlement of moving animals. Qualitative assessment of land designated for gameresettlement. Resettlement forecasting.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of practical training \**

**Zoogeographical and hunting zoning.** Patterns of geographical distribution of animals. Zoogeographical zoning. Zoogeographical areas and their fauna. Zoogeographical fauna characteristics of Ukraine. Active and passive settlement. Migration paths (historical and contemporary aspects). Zoogeographical elements of flora and fauna complexes. Hunting zoning in Ukraine.

**Immobilization and transport of animals.** Means and effects of chemical immobilization of wild animals. Remote injection animal anesthesia. Requirements for transportation and vehicle design.

**Hunting resources of Ukraine and the world.** Inventory of hunting resources. Classification of hunting methods and tools. Regional hunting in Ukraine. Hunting ethics. Changes of hunting fauna in Ukraine in the context of historical periods. Game species and hunting traditions in the world. Unitization and reproduction of game fauna.

**Regional game management industry in Ukraine.** Structure of the hunting industry in Ukraine. Hunting grounds utilization. Regional differences. Regional conservation status of game animals. Problems and prospects of hunting in different regions of Ukraine.

**The evolution of the animal world.** Stages of development of fauna and main representatives of the faunal complexes during different geological eras. Configuration principles of species composition of hunting. Biotechnical principles allowing for the evolution of animals.

### 2.2. *Disciplines chosen by students*

#### 2.2.1. *Cycle of professional training \**

**Hunting tourism.** Domestic and international tourism and game population management. Promoting hunting services and trophies. Tour design and implementation, green tourism, range tourism etc.

**Zoo management.** Zoos in forest hunting enterprises. Modern technology of keeping, breeding, exhibiting and preserving wildlife in ex-situ. Organization of scientific, educational and environmental activities in zoos.

**Master Training  
in specialty “Park and Gardening Management”  
Branch of knowledge “Agriculture and Forestry”**

**Form of training, licensed number of students:**

– full time 75

– correspondence 75

**Term of study** 1,5 year

**Credits** 90 ECTS

**Language of teaching** Ukrainian

**Qualification of graduates** master's degree in Park and Gardening management

**The concept of training**

The concept and goal of training specialists in Park Gardening Management is the necessity of training specialists with system knowledge in use of Park Gardening Management resources in our state and transition to European standards of living that are focused on the natural ability of regeneration of forests: ensuring ecological and esthetical management based on forest management and comprehensive use of resources, taking into account historical and landscape aspects, revisions of principles of distribution of plantations according to ecological and economic value depending on benefits of their functions, decreasing recreational activity, replacement of old planting, especially in the forests of green belts situated around settlements; preservation of biodiversity of planting of general and limited use; inventory and optimization of protected areas and objects; including measures of regional ecological, economic and social conditions; monitoring of planting, creation and growing plants resistant to extreme environmental conditions of forest biogeocenosis in Steppe considering the necessity of transfer of management on the landscape- ecological principles; improvement of scientific and staff providing Park Gardening management; improvement of the system of planting inventory and monitoring and objects of landscape architecture based on GIS technology; improvement of the system of informing industry and introduction of information technologies.

**Production oriented master program**

***Master program “Landscape architecture”***

Oriented to forming in future specialists complex approach to analysis, ground of acceptance and realization of decisions in exploitation, reconstruction and restoration of park and garden objects, planning of landscape objects of the different special purpose by means of modern computer technologies se in accordance with modern requirements of Park Gardening Management in Ukraine.

**Sphere of graduates employment**

The graduates of Master's program “Landscape architecture” will be able to work as: junior research worker, planning and organization of public services engineer or spesialist, landscape design specialist, park-gardening worker.

***Master program “Decorative Nursery”***

Foresees mastering by students theoretical knowledge and modern technologies of decorative planting stock production: generative, vegetative and microclonal woody plants reproduction, container culture of trees and shrubs, features and growing, shaping and using different purpose seedlings, etc.

**Sphere of graduates employment**

Graduates of Master's program "Decorative Nursery" would be able to work as: junior research worker, nursery garden chief, planning and organization of public services engineer, landscaper, green planting worker, gardener.

***Master program "Landscape building"***

Foresees mastering by students theoretical knowledge and practical skills in economic and building work on landscape objects, mastering the latest engineering technologies in creating of landscaping objects, planting and caring of decorative plants, studying machines and mechanisms, which are necessary for creating, organization and keeping of landscaping objects.

**Sphere of graduates employment**

Graduates of Master's program "Landscape building" would be able to work as: junior research worker, planning and organization of public services (improvement) engineer, landscaper, green planting or laying out of parks worker, gardener.

***Master program "Ornamental horticulture"***

Forms theoretical knowledge and practical skills in reproduction, technology of growing planting stock in hothouse complex and in decorative nursery gardens for creating landscape objects.

**Sphere of graduates employment**

Graduates of master's program "Ornamental horticulture" would be able to work as: junior research worker, green planting master, green planting or laying out of parks worker, gardener, nursery garden chief, hothouse farm master.

***Master program "Conservancy science of parks"***

Based on the gained scientific knowledge and according to the state pattern, students elaborate schemes of territorial organization of a reserve parks, make scientific collections of rare phytodiversity, determine value of natural heritage, inspect conservancy ecosystems of reserve parks, etc.; enrich knowledge about possession of the elements of science and education management, management of artificial objects institutions activities of wildlife sanctuary fund.

**Sphere of graduates employment**

The graduates of Master's program "Conservancy science of parks" would be able to work as: research workers in conservancy enterprises: reserves, nature reserves, national parks, etc.

**Research oriented master program**

***Master program "Scientific bases of preservation and use of biodiversity of arboreal species in decorative plantations"***

Directed on forming in future specialists complex approach to studying the matter of creation and keeping green plantations, their preservation and enrichment according to the modern requirements of Park Gardening Management. Scientific research in Park Gardening Management has applied disposition and concerns the cognition of complicated nature of green plantings, that's why it is necessarily to represent the methodology of research, namely the principles of building, form and way of scientifically- cognitive activity. Master's training program of landscaping provides receiving practical skills in research of biodiversity of arboreal plants in plantations.

---



### **Sphere of graduates employment**

The graduates of Master's program "Scientific bases of preservation and using the biodiversity of arboreal species in decorative plantations" would be able to work as: research workers in scientific-research institutions, lecturers of higher educational establishments of I-IV accreditation level.

### **Master program of Applied Biology on specialization "Laboratory work" of expert-control sector of employment**

#### ***Master program "Methods of entomological control in plant growing and natural resources"***

The program focuses on theoretical and practical training students for solving, scientific explanation and development of methods for entomological control of populations of woody plants' pests.

### **Sphere of graduates employment**

Graduates can be employed in specialized laboratories that are subordinated to the State Phytosanitary Service of Ukraine, the Main State Inspection for Plant Protection, the Ministry of Ecology and Natural Resources of Ukraine, the State Administration of Environmental Protection, State Environmental Inspectorate, the State Agricultural Inspection economy, the State Agency of forest resources of Ukraine, the State Sanitary and Epidemiological Service of Ukraine, services and agencies that provide environmental control, management and regulation of territories and objects of natural reserve fund, reproduction and protection of natural resources, etc., and focused on monitoring the quality of environment.

Master's programs in applied biology with a specialization "laboratory work" of expert control's sector of employment, based educational and research laboratories, educational and research institutions and the Ukrainian Laboratory of Quality and Safety of Agricultural Products provide mastering of modern methods of chemical, physical and chemical, biological, environmental expertise and evaluation of quality and safety related facilities according to international standards.

### **Practical training**

Bases of practical training are educational, scientific-educational and educational-professional laboratories of Institute's departments, "Boyarka Forest Research Station" Subdivision of NULESU, educational-scientific-research nursery garden of reforestation and forest-growing, Botanical garden of NULESU, Velykosnitynka Training and Research Farm named after Muzychenko, Subdivision of NULESU, "Vorzel" Training and Research Farm, Subdivision of NULESU, Training and Research Center of Biology, and Ecology of Subtropical Plants and Landscape Science of NULESU (Yalta, Crimea), Central botanic garden named after Gryshko of the National Academy of Sciences of Ukraine, Botanic garden named after Fomyn and others.

### **Proposed Topics for Master Theses**

1. Territory reconstruction project of the landscape art memorial park.
  2. Ornamental painting of stones in small gardens' design.
  3. Project of recreation-demonstrational area organization in decorative nursery garden.
  4. Project of landscaping and improvement school and kindergartens territories.
  5. Experience of school territories in Ukraine landscaping.
  6. European experience of using species of *Buxus L.* genus in landscaping.
-

**MASTER DEGREE PROGRAMS**

7. Dendrological grade of existing assortment of Gymnosperms and prospects of replenishment the decorative forms collection of botanical gardens.
8. Technological peculiarities of forcing flowering plants varieties.
9. Baroque, rococo and classicism in modern phytodesign aspect.
10. Woody plants reproduction peculiarities.

**Academic rights of applicants for a master program**

Besides specialty “Park and Gardening Management” entrants with Bachelor’s diploma of direction of training “Forestry and Park Gardening Management” may continue studying on specialties in the branch of knowledge “**Agriculture and Forestry**”:

- 8.09010301 – Forestry (see p. 275)

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Park and Gardening management”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
1.1. Cycle of humanitarian, social and economic training*					
1	Philosophy of sciences and innovative development	1	72	1,3	2,0
2	Business foreign language	1	72	1,3	2,0
Total number			144	2,6	4,0
1.2. Cycle of natural science (fundamental) training*					
1	Methodology of scientific research	1	54	1,0	1,5
2	Greenhouse facility	3	108	2,0	3,0
Total number			162	3,0	4,5
1.3. Cycle of professional and practical training *					
1	Labour protection	2	108	2,0	3,0
2	Ornamental horticulture	1	144	2,7	4,0
3	Parks and gardens planning	2	90	1,7	2,5
4	Reconstruction and restoration of landscape-gardening objects	1	162	3,0	4,5
5	Dendrological projecting	1	126	2,3	3,5
6	Forest-parks management	2	108	2,0	3,0
7	Inner phytodesign	3	90	1,7	2,5
8	Landscape-gardening objects exploitation	3	72	1,3	2,0
Total number			900	16,7	25,0
Total according to regulatory part			1206	22,3	33,5
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional and practical training					
1	Accounting and audit	2	126	2,3	3,5
2	Soils and soils compounds	2	126	2,3	3,0
3	Computer design technologies	2	216	4,0	6,0
4	Management and marketing in Park-gardening	3	108	2,0	3,0
Total chosen by university			576	10,7	16,0
Production oriented disciplines					

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>Master program "Landscape architecture"</b>					
1	Landscape design	2	108	2,0	3,0
2	Recultivation of affected landscapes	2	162	3,0	4,5
3	Park studies	3	108	2,0	3,0
<b>Master program "Ornamental horticulture"</b>					
1	Plant breeding and seed study	2	108	2,0	3,0
2	Recultivation of affected landscapes	2	162	3,0	4,5
3	Ornamental plants protection	3	108	2,0	3,0
<b>Master program "Conservancy park science"</b>					
1	Nature protected areas study	3	108	2,0	3,0
2	Recultivation of affected landscapes	2	162	3,0	4,5
3	World landscape heredity	2	108	2,0	3,0
<b>Master program "Ornamental Nursery"</b>					
1	Modern technologies in ornamental nursery	2	108	2,0	3,0
2	Woody plants growth and mineral nutrition regulation	2	162	3,0	4,5
3	Potted woody plants growing	3	108	2,0	3,0
<b>Master program "Landscape building"</b>					
1	Vertical planning of landscape objects	2	108	2,0	3,0
2	Agricultural engineering in park- garden building	2	162	3,0	4,5
3	Parks and garden constructions, mechanisms and equipment	3	108	2,0	3,0
<b>Master's program "Methods of entomological control in plant growing and environment"</b>					
1	Methodology and technical support of modern entomological research	2	108	2,0	3,00
2	Biocenology of insects.	2	162	3,0	4,50
3	Phytosanitary and ecological examination.	3	108	2,0	3,00
Total chosen by university			378	7,0	10,5
<b>2.2. Disciplines chosen by students</b>					
<b>2.2.1. Cycle of professional and practical training</b>					
<b>Production oriented disciplines</b>					
<b>Master program "Landscape architecture"</b>					
1	Landscape planning	3	72	1,3	2,0
2	Form diversity of ornamental woody plants	3	72	1,3	2,0
3	Ecological examination	3	72	1,3	2,0
<b>Master program "Ornamental horticulture"</b>					
1	Ornamental horticulture	3	72	1,3	2,0
2	Form diversity of ornamental woody plants	3	72	1,3	2,0
3	Worldwide technologies in ornamental nursery	3	72	1,3	2,0
<b>Master program "Conservancy park science"</b>					
1	Park science	3	72	1,3	2,0
2	Biosozology	3	72	1,3	2,0
3	Nature reserved areas ecological control	3	72	1,3	2,0
<b>Master program "Ornamental Nursery"</b>					
1	Nurseries rules and regulations	3	72	1,3	2,0
2	Biotechnology methods in decorative nursery	3	72	1,3	2,0
3	Planting stock quality and methods of its estimation	3	72	1,3	2,0
<b>Master program "Landscape building"</b>					
1	Landscape projecting	3	72	1,3	2,0
2	Recultivation of affected landscapes	3	72	1,3	2,0
3	Ornamental plants protection	3	72	1,3	2,0
<b>Master program "Methods of entomological control in plant growing and environment"</b>					
1	System analysis of environmental quality and plant growing products	3	72	1,3	2,00
2	Entomopathological complex monitoring.	3	72	1,3	2,00
3	Quantity adjusting of entomopathology complex.	3	72	1,3	2,00
Total selected by the students			216	3,9	6,0
<b>Research oriented disciplines</b>					
<b>Master program "Scientific bases of preservation and using biodiversity of woody species in</b>					

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
decorative plantations”					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional and practical training					
1	Introduction and adaptation of ornamental plants	2	108	2,0	3,0
2	World phytocollections	2	162	3,0	4,5
3	Form diversity of ornamental woody plants	3	108	2,0	3,0
Total chosen by university			378	7,0	10,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training					
1	Nature reserve business	3	72	1,3	2,0
2	Artificial change of ornamental plants shape	3	72	1,3	2,0
3	Recreational park studies	3	72	1,3	2,0
Total selected by the students			216	3,9	6,0
Total number of elected part			1170	21,7	32,5
Practical training			360	6,7	10,0
Writing and defence of master's thesis			360	6,7	10,0
Total for specialty			3240	60,0	90,0

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

*1.1. Cycle of humanitarian, social and economic training\**

**Philosophy of sciences and innovative development.** The course opens the specificity of innovative development and sciences philosophy as a special type of humanity knowledge and an educational discipline. It gives a characteristic of the historical development in general directions and methodological stages of solving the main problems of the innovative development and sciences philosophy. Methodological, structural, world-view, value system bases of scientific cognition are observed. The philosophical analysis of the nowadays Ukrainian and world science condition, prospects of its development and interaction with other spheres of social activity, and also the main problems of biological sciences and ecology are being realized.

**Business foreign language.** Studying foreign language to know it within the specialty. Professional vocabulary and grammar minimum. Written business communication, compositing accounts and reports. Speech-communicative peculiarities of verbal presentations.

*1.2. Cycle of natural science (fundamental) training\**

**Scientific research methodology.** Concepts about scientific knowledge, classification of sciences and basic concepts which determine the contest of scientific research are considered. Main concepts about methodology and classification of scientific research, its specialties in forest conditions and methods, which are used in view of it, are stated. Problems about planning and sequence of scientific-research work of students and young scientists, work with scientific literature are shown.

**Greenhouse farming.** Detailed studying of the technologies of blooming plants on the industrial base; acquainting with the main types of pests and measures of pest control – expects deeper studying of technological processes, detailed familiarization with technologies of growing different flower production, accounting of industrial space requirement, organization of the manufacturing process and as a result – organization of greenhouse facility with taking into account specifics of its work.

1.3. *Cycle of professional and practical training\**

**Labour protection.** Legislation in the labor protection. Labour hygiene and professional sanitary. First aid. Providing healthy work conditions in park-gardening menegement.

**Ornamental horticulture.** The course of “Ornamental horticulture” is dedicated for studying theoretical and practical bases of reproduction, growing and using of the woody plants during the creation of ornamental plantings. “Ornamental horticulture” gives theoretical and practical knowledge to future specialists about the assortment of ornamental plants, ways of reproduction, technologies of growing, creation of man-made qualities of woody plants and their keeping in ornamental plantings.

**Park and gardens planning.** Planning of cost, profit, and commodity production. Prices. Enterprise financing. Financial plan. Types of accounting. Professional activity analysis.

**Reconstruction and restoration of landscape-gardening objects.** Forming of professional approach to the accomplishment of reconstruction, concervation, adaptation, and protection of existing landscape architecture objects is the main task for landscaping specialist. Discipline takes the leading part in the landscaping cycle disciplines, because the bigger part of town’s complex green zone objects are the objects of reconstruction and restoration.

**Dendrological projecting .** The subject observes the main principles of projecting green plantations systems, specifics of landscape-dimensional and landscape-planning composition, peculiarities of woody plants assortment selection during the creating of main plantations elements of composition. When studying the subject students consider physionomical types of woody plants according to L.I. Rubtsov.

**Forest-parks management.** Modern forest-parks management is directed to understanding the bases of biological essence of the forest, regularities of its growth and development, mastering the methods of forest typology, knowlage of different kinds of forest use, including recreational, studying the bases and methods of management of forest-parks and the green belts of cities. Using the mastered principles and methods of formation the park plantings future landscaping specialist should form the forest-park landscapes purposeful, ecological correctly, with taking into consideration peculiarities of growth arboreal, shrubbery and meadow phytocoenosis, which are resistant to the antropogenic loading and unreceptive nature factors.

**Inner phytodesign.** The “Inner phytodesign” subject gives theoretical and practical knowledge about the phytodesign of the specific Earth regions plants, forming of the long-lasting groupings of a leafy-decorative and flowering subtropical and tropical plants to the future specialists, acquaints with the rules of their keeping. It studies the rules of creating compositions and combination plants according to ecological, decorative and functional principles in different types and styles of interior, opens specifics of keeping plants in this type of compositions.

**Landscape gardening objects exploitation.** Landscape gardening objects exploitation is an important part of town planning and city economy complex. It includes a number of different complicacy problems, connected with the building of landscape-gardening objects, creating, forming, and keeping their important part – green plantings. Landscape gardening objects exploitation is a complicated complex of measures, which provide the solution of different tasks of law, agrotechnical, aesthetic, organizational, economical-exploitational, economical character, directed to creation, forming and keeping landscape gardening objects of different functional purposes.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training\**

**Accounting and audit.** Main concepts of the accounting. Accounting balance. Documents, inventory and organization forms of accounting. Audit and audit activities.

**Soils and soil compounds.** The course program allows mastering the bases of controlling the soil nutrition conditions for the ornamental plants. It provides the preparation of specialist in possession of knowledge and skills, and gives an ability to create the optimal models of the nutrition regime and manage it according to the biological requirements of the plants.

**Computer design technologies.** Designing of park-gardening objects using computer programs. Students perform the course project within such programs as ArhiCAD, REALTIME, Photo Land Designer, SIERRALANDDESIGNER 3D, etc.

**Park-gardening management and marketing.** Origins and developing of management. Specifics of management activity on park-gardening enterprises. Management functions and their realization on park-gardening enterprises. Principles and methods of management. The essence of the process of making decisions in park-gardening management. Socially-economic essence of marketing. Specifics of marketing activity on enterprises. Marketing research and marketing information system. Marketing communication, commodity and distribution policy.

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training*

#### *Production oriented disciplines*

#### **Master program “Landscape architecture”**

**Landscape design.** Landscape design as a modern direction of landscape architecture. Landscape design practice considering individual components and elements of landscape: relief geoplastics; water structures; plant forms; colouristics of plantations; small architectural forms. Creation of small garden.

**Recultivation of affected landscapes.** In a course basic information is given about factors, kinds and degree of violation of landscape structure, classification of basic forms of technogenic relief of earth surface. The program is based on modern information of theoretical and practical value, which is necessary for organization of work for recultivation of **affected** land and formation of phytocenosis for melioration.

**Park studies.** Studies the aspects of dendrological composition of different categories of park plantations, longevity of woody plants, analyze territories of parks and forest-parks as a phytocenosis objects, investigates general progress of park phytocenosis and phytogeographical aspect, ecology of park environment trends, in thereby to monitoring of green plantations and ground conditions. Lights up physiognomic groups and types of arboreal plants, studies natural landscapes as feedstock for park building, features of creation of some types of park and garden landscapes, forming of displays of botanical gardens and dendrological parks.

#### **Master program “Ornamental horticulture”**

**Plant breeding and seed study.** Subject studies fruits and determination of purity and germination of annual, biennial, and perennial herbaceous plants seeds; classification of the most widespread annuals, biennials, tuberous, corms, rhizome plants; creation of module flower-gardens using different types of plants; general terms of methodology of plant sort determination.

**Recultivation of affected landscapes.** In a course basic information is given about factors, kinds and degree of violation of landscape structure, classification of basic forms of technogenic relief of earth surface. The program is based on modern information of theoretical and practical value, which is necessary for organization of works from recultivation of affected land and forming phytocenosis for melioration.

**Ornamental plants protection.** Methods of observation and entomopathological inspections, pest quantity accounts and level of pathogenicity of plant diseases pathogens, and also methods and facilities of decorative plant protection, prognostication of possible pathological changes in biocenoses, facilities of protection during the stowage of the complex systems of pest control and pathogens in corresponding biocenoses.

#### **Master program “Conservancy science of parks”**

Nature conservation. Students study history of testament of nature in Ukraine, theoretical bases of conservancy, protected inheritance of nature, classification of nature protection territories, system of forming nature-protected fund as bases of ecological net, structural-functional organization of nature-protected territories and objects, and also institutional development of the nature-protected business as one of basic sub industries environment protection.

**Recultivation of affected landscapes.** In a course basic information is given about factors, kinds and degree of violation of landscape structure, classification of basic forms of technogenic relief of earth surface. The program is based on modern information of theoretical and practical value, which is necessary for organization of recultivation of the affected land and forming of phytocenoses for melioration.

**World landscape heredity.** The subject provides studying of objects of cultural heritage of Germany, Italy, France, India, Pakistan, Israel, Spain, Portugal, Shri-Lanka, Japan, China, Czech Republic, Poland, that which included to the List of world inheritance of UNESCO, criteria of cultural and natural heritage. Acquaintance with foreign experience of cultural landscape and other objects of cultural heritage management.

#### **Master program “Decorative Nursery”**

**Modern technologies in ornamental nursery studies.** World experience of planting stock growing. Planning of ornamental planting stock growing measures. Features of ornamental nurseries organization and agrotechnics of planting stock growing.

**Woody plants growth and mineral nutrition regulation.** Subject embraces basic knowledge in relation to growing and nutrition of ornamental woody plants, using chemical and biological preparations for strengthening basic plant functions.

**Potted woody plants growing.** Scientific bases of decorative planting stock in a container culture organization of production. Technological features of growing and use of planting stock with the closed root system for green planting for urban landscapes.

#### **Master program “Landscape building”**

**Vertical planning of landscaping objects.** Basic concepts, principles, methods, requirements of normative documents and sequence of implementation of work are studied at traditional and automated methods of stowage of projects of the vertical planning of municipal territory, housing building, areas of green plantations.

**Agricultural engineering in park-garden building.** Park-garden building is important component in the general complex of town-planning and municipal economy. Includes the circle of various after the degree of complication questions of related to planning, building, exploitation of park and garden objects, creation, forming and maintenance of their important constituent - decorative planting. An agrotechnics in park and garden building is the complex of measures, which envisage the decision of the various tasks of legal, aesthetic, organizational, operating-economic, economic character,

---

sent to creation and maintenance of the high-decorative planting of park and garden objects various purposes.

**Park-garden constructions, mechanisms and equipment.** Modern landscape building is important component part in the general complex of town-planning and municipal economy. It includes the circle of various questions, what planning, building, creation, forming, related to the features, and also further exploitation and maintenance of park-gardening garden objects. A considerable place in the list of the marked questions is occupied by park and garden constructions, mechanisms and equipments that allow realization of complex works on park-gardening objects with the use of modern machines, mechanisms and appliances.

### **Master program “Methods of entomological control in plant growing and environment”**

**Biocenology of insects.** Studies insects groups, conformities to law of their cenoses functioning organization, and also variety of species coadaptation forms and correlation in ecological niches of different natural-geographic ecosystem types is actual both in theoretical and in practical plans.

**Methodology and technical support of modern entomological research.** Diagnostics of the forest diseases according to the microscopic symptoms and mycology signs of supervision and height to mycelium in a pure culture. Determination of pests presence and pathogens by means of physical and chemical methods. Character of colouring of the staggered wood and decay causative agents.

**Phytosanitary and ecological examination.** Phytosanitary examination is component part of the state phytosanitary checking system in Ukraine. A study is the systems of measures, the aim of that is a guard of territory and health of population of Ukraine from penetration from abroad and other dangerous wreckers, causative agents of illnesses, plants and weeds that can inflict considerable losses to the national economy of Ukraine quarantine.

#### *2.2. Disciplines chosen by students*

##### *2.2.1. Cycle of professional and practical training \**

#### *Production oriented disciplines*

### **Master program “Landscape architecture”**

**Landscape planning.** Within the limits of discipline the historical, social and town planning aspects of landscape objects forming are studied. The historical review of development of park and garden styles and their influence are brought around to modern progress of landscape architecture trends. Theoretical bases and practical methods of the landscape planning are examined, in particular an architectonically-plan and volume-spatial system of municipal space forming, use of natural and artificial components in the construction of landscape objects composition.

**Form diversity of ornamental woody plants.** Form diversity of ornamental woody plants is part of dendrology, that studies the cultures of woody plants, classification of decorative characteristics, methods of receipt, biological and ecological features are studied students the most widespread and interesting cultures of arboreal plants and their classification. On completion of study of discipline students must be oriented in the varietal diversity of woody plants and own skills of the use in green planting.

**Ecological examination.** Course of discipline “Ecological examination” studies the estimation of possible influence of the envisaged or pre-arranged activity on the state of environment, its accordance to the requirements of ecological legislation.



### **Master program “Ornamental horticulture”**

**Ornamental horticulture.** A study of theoretical and practical principles of reproduction, growing and use of arboreal plants is at creation of the decorative planting. The “Ornamental horticulture” gives to future specialists theoretical and practical knowledge about the assortment of decorative plants, methods of reproduction, technology of growing, creation of decorative artificial characteristics of woody plants and supervision upon them in the decorative planting.

**Form diversity of ornamental woody plants.** Form diversity of ornamental woody plants is part of dendrology, that studies the cultures of woody plants, classification of decorative characteristics, methods of receipt, biological and ecological features are studied students the most widespread and interesting cultures of arboreal plants and their classification. On completion of discipline study students must be oriented in the varietal diversity of woody plants and own skills of the use in green planting.

**World technologies in ornamental nursery studies.** World experience of planting stock raising. Planning of ornamental planting stock raising measures. Features of ornamental nurseries organization and agrotechnics of planting stock growing.

### **Master program “Conservancy science of parks”**

**Park studies.** Studies the aspects of dendrological composition of different categories of park plantations, longevity of arboreal plants, analyze territories of parks and forest-parks as a phytocenosis objects, investigates general progress of park phytocenosis and phytogeographical aspect, ecology of park environment trends, in thereby to monitoring of green plantations and ground conditions. Lights up physiognomic groups and types of arboreal plants, studies natural landscapes as feedstock for park building, features of creation of some types of park and garden landscapes, forming of displays of botanical gardens and dendrological parks.

**Biosozology.** Students study history of guard of biodiversity of Ukraine, concept about a gene pool, structure of outphytosozology, categorizing principles of kinds that is guarded, category of types of plants and animals that is guarded, European Red list, Red book of Ukraine, regional Red lists, concepts about a demographic fund, basic lines of spatio-temporal organization of populations, ecological bases of maintenance of populations, concept about a gene pool, structure of synphytosozology, categorizing principles of rarity phytocenosis, category of guarded phytocenosis, Green book of Ukraine, ecological maintenance bases.

**Nature reserved areas ecological control.** In the volume of educational discipline “Nature reserved areas ecological control” students study the state ecological checking system, local and public ecological checking system, ecological checking system in forming of national ecological network. Control is after the mode of environment in natural parks (on earth that is not shown out of economic exploitation), in state natural reserves and national parks zones.

### **Master program “Ornamental nursery”**

**Nurseries rules and regulations.** A legislation is in relation to a seed-growing and nursery. Normative and regulating materials in the sphere of nursery. Documents about the seed quality and planting stock quality.

**Biotechnology methods in ornamental nurseries.** Modern state and prospects of development of method of microclonal reproduction of arboreal plants. Calusogeny, morphogeny and features of microclonal reproduction of decorative woody plants.

**Planting stock quality and methods of its estimation.** General approaches in relation to determination of the planting stock quality. Home and world standards are for planting stock. Features of quality determination of the woody plants nursery transplants.

---

### **Master program “Landscape building”**

**Landscape planning.** Within the limits of discipline the historical are studied, social and town planning aspects of forming of landscape objects. The historical review of development of park and garden styles and their influence are brought around to modern progress of landscape architecture trends. Theoretical bases and practical methods of the landscape planning are examined, in particular an architectonically-plan and volume-spatial system of municipal space forming, use of natural and artificial components in the construction of landscape objects composition.

**Recultivation of affected landscapes.** In a course basic information is given about factors, kinds and degree of violation of landscape structure, classification of basic forms of technogenic relief of earth surface. The program is based on modern information of theoretical and practical value, that is needed for organization of works from recultivation of the broken earth and forming phytocenosis for melioration.

**Ornamental plants protection.** Methods of supervision and entomopathological inspections, pests quantity accounts and level of illnesses causative agents pathogenicity, and also methods and facilities of decorative, prognostication protection of possible pathological changes, are in biocenoses, facilities of protection during the stowage of the complex systems of fight against pests and causative agents of illnesses in corresponding biocenoses.

### **Master program “Methods of entomological control in plant growing and environment”**

**System analysis of environment and plant-growing products quality.** Research consumer internals of plant-growing products dynamics changes, study of science, which gives the system theoretical and practical ground of the remote sensing, rapid analysis of the state of natural objects, various factors influence on the quality of agricultural production and the problem of environment guard. Development of roughing-out technologies and products storage facilities of plant-growers provides a maximal exit and high quality on all way of moving from the field to the consumer.

**Entomopathological complex monitoring.** Modern instrumental methods of the phytosanitary monitoring of the forest-park planting are offered. As a result specific authentication of complex of dominant types of herbivores, as a result of becoming of threshold levels of their quantity and harmfulness. On this basis the complex of original technological receptions is offered from protecting of the forest-park planting from dominant phytophagans and disease causative agents.

**Quantity regulation of entomopathological complex.** Priority is given to technologies in composition of which there are methods of biological protection of plants, in particular settling of laboratory cultures is types of family Trichogram and Gabrobrakon on trees. In addition the complex of receptions sent is offered to maintenance, accumulation and settling of natural populations of parasites.

#### *2.3. Disciplines chosen by students*

##### *2.3.2. Cycle of professional and practical training\**

#### *Research oriented disciplines*

### **Master program “Scientific bases of woody species biodiversity conservation and using in decorative plantations”.**

**Introduction and adaptation.** Introduction and adaptation of plants have a big theoretical and practical sense. Students know theoretical and practical aspects of introduction of plants and acquire skills of work when the students learn the discipline. Besides, they learn bioenvironmental features of arboreal species in the conditions of introduction.

---

**World phytocollections.** Students study basic phytocollections of European countries which are bordered on Ukraine, phytocollections of South- and North-American countries and the main collections of African countries, Oceania and the Antarctic.

**Form variety of decorative woody plants.** Form variety of decorative woody plants is a part of dendrology that studies cultures of woody plants, classification of decorative qualities, methods of receipt, biological and ecological features of woody plants and their classification. After learning this subject students must know culture variety of woody species and have skills to use them in landscaping.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training\**

**Naturally-protected business.** Students learn history of natural conversations in Ukraine, theoretical bases of conservancy, protected inheritance of nature, classifications of nature protection territories, structurally-functional organization of naturally-protected territories and objects and development of naturally-protected business.

**Artificial change of decorative plants.** This discipline learns different technologies of artificial change of decorative plants. Students learn historical and modern development of nivaki in the parks of Japan, arbosculpture in the Northern America and England, «green» houses in Germany. Students know features of the mold-baked decorative garden and learn also classification of bonsais and features of their creation.

**Recreational park science.** learns questions of dendrology composition different categories of park plants, longevity of arboreal plants, analyses territories of parks and forest-parks, research general progress of phytogeographical aspect, ecology of park environment and monitoring of planting and waters. This discipline lights up physiognomic groups and types of arboreal plants, studies natural landscapes, features of creation different types for park-garden landscapes and forming of displays of botanical gardens.

---

**EDUCATIONAL AND RESEARCH INSTITUTE  
OF LAND RESOURCES AND JURISPRUDENCE**

**Director – Volodymyr I. Kurylo, Doctor of Law, Professor**  
**Tel.: (044) 259-97-31**  
**E-mail: llp\_nni\_director@twin.nubip.edu.ua**  
**Location: educational building № 6, room 212**

**LAW FACULTY**

**Dean – Olena S. Yara, Candidate of Science in Law, Associate professor**  
**Tel.: (044) 259-97-25**  
**E-mail: lawyer\_dean@twin.nubip.edu.ua**  
**Location: educational building № 6, room 231**

**Faculty provides training in the following specialties:**

**8.03040101 – “Law Science”**  
**Department in charge of graduate training:**  
**Agrarian, land and environmental law named after V.Z.Yanchuk**  
**Tel.: (044) 259-97-25**  
**E-mail: agrolaw\_chair @twin.nubip.edu.ua**  
**Head of department – Doctor of Law, Professor V.M. Yermolenko**

**FACULTY OF LAND MANAGEMENT**

**J**

**Dean - Olga S. Dorosh , Candidate of Economic Science, Associate professor**  
**Tel.: (044) 258-05-25**  
**E-mail: landuse\_dean@twin.nauu.kiev.ua**  
**Location: educational building № 6, room 219**

**Faculty provides training in the following specialties:**

**8.08010103 – “Land Management and Cadastre”**  
**Departments in charge of graduate training:**  
**Land Resources Administration Management**  
**Tel.: (044) 258-05-25**  
**E-mail: Uzr\_k@ukr.net,**  
**Head of department – Doctor of Economics, Professor D.S. Dobryak**

**Land Cadastre**  
**Tel.: (044) 258-05-25**  
**E-mail: cad@i.com.ua**  
**Head of department – Candidate of Economic Sciences, Professor G.K. Loyik**

---

**Master Training  
in specialty "LAW SCIENCE"  
Branch of knowledge "Law Science"**

**Form of training, licensed number of students:**

<b>– full-time</b>	<b>15</b>
<b>– correspondence</b>	<b>-</b>
<b>Term of study</b>	<b>1,5 year</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian</b>
<b>Qualification of graduates</b>	<b>Master of Law</b>

**The concept of training**

Program goal-oriented training of legal experts in law to meet the needs for legal services of the state agricultural sector, including agricultural enterprises of all forms of ownership and legal organizational forms, the sphere of land relations, provision with qualified legal personnel of state organs, public organizations, other enterprises and organizations.

**Production oriented master program**

***Master program "Agrarian Law"***

The Master program was created based on the state and prospects of development of agrarian science in Ukraine and worldwide. The curriculum provides for training of professionals that will have a profound theoretical basis of agricultural, land, environmental and natural resource law, but also be able to apply modern legal techniques for basic and applied research in law. Education is oriented upon in-depth mastery of academic knowledge and development of skills of their practical application.

**Sphere of graduates employment**

The program of training for lawyers of agrarian direction provides for personnel needs of Agro-industrial complex and rural social sphere. The level of training and qualifications of graduates gives them the opportunity to work as a lawyer in various economic entities in AIC, in the state executive authorities, local government bodies, relevant departments and offices that exercise powers concerning implementation of state agricultural policy. The program also provides adequate training of future researchers, namely: a graduate student, a teaching assistant, a senior lecturer, a researcher.

**Research oriented master program**

***Master program "Legal regulation of agrarian relations"***

The master program allows to cover maximally the range of theoretical and practical issues that professionals face most often in the field of agrarian legal relations. It promotes students' integrated knowledge system not only in the disciplines of "agrarian direction", but also in those related sciences that constitute the basis for the training of a fully developed specialist. For this specialization is provided the organization of the practice in scientific and research institutions.

---

### Sphere of graduates employment

Training and qualification of graduates of research specialization gives them the opportunity to work with the Ministry of Agrarian Policy and Food of Ukraine and its territorial offices, universities, academic and research institutions in positions of researchers.

### Practical training

The aim of the practice is obtaining by the master students of practical skills in agriculture, agricultural production and environmental management. The difficulty lies not only in the problems of application of the imperfect legislation, but, chiefly, in the need to master the many different law provisions of different areas of law, the knowledge of which eventually form a real professional, able to withstand any competition in the legal services market. This knowledge enable practicing lawyers to find an optimal solution of a complex legal problems and achieve its implementation through the competent public authorities.

### Proposed Topics for Master Theses

1. Legal regulation of use and protection of flora.
2. The legal regime of lands for residential and public development in Ukraine.
3. General characteristics of common agricultural policy of the EU.
4. Legal regulation of circulation of land plots.
5. State Land Bank of Ukraine, as the subject of land legal relations.
6. Legal responsibility for offenses in office in land relations.
7. Legal regulation of activity of farms.
8. Regime of reserve lands in Ukraine.
9. Legal provision of registration of land plots and rights to them.
10. Legal regulation of social infrastructure in Ukraine.

### Academic rights of applicants for a master program

In addition to the specialty "Law" the applicants with a bachelor diploma with a direction of training "Law" may continue education according to the specialties in **the branch of knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
- 8.18010021 – "Pedagogy of Higher School" (see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – "Educational Institution Management" (see p. 427).

### Curriculum for specialist training of the educational and qualification level "Master" in specialty "Law Science"

№ п/п	Discipline, practice	Semester	Number		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	54	1,0	1,5
2	Philosophy of science and innovative development	1	54	1,0	1,5
3	Strategy of sustainable development of nature and society	1	36	0,6	1,0
4	International legal provision of food safety	1	36	0,7	1,0
5	International standardization, certification of technology, raw materials and finished products	1	36	0,7	1,0
<i>Total number</i>			216	4,0	6,0

**MASTER DEGREE PROGRAMS**

№ п/п	Discipline, practice	Semester	Number		
			hours	credits	
				national	ECTS
<i>1.2.Cycle of professional and practical training *</i>					
1	Modern issues of land law	1	180	3,3	5,0
2	Issues of environmental law	2	180	3,3	5,0
3	Theoretical Issues of civil law	1,2	180	3,3	5,0
4	Current issues of agrarian law	2	180	3,3	5,0
5	Administrative jurisdiction in the agricultural sector	1	108	2,0	3,0
6	Pedagogy of Higher education	1	144	2,7	4,0
7	Legal regulation of the quality and safety of agricultural products.	2	180	3,3	5,0
<i>Total number</i>			1152	21,3	29,0
Total according to regulatory part			1368	25,3	38,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>1.3.Cycle of professional and practical training *</i>					
1	Current issues of agrarian legislation of foreign countries	2	144	2,7	4,0
2	Teaching methodology of law disciplines in higher educational institutions.	2	108	2,0	3,0
3	Problems of relations in biotechnologies	3	108	2,0	3,0
4	Legal Issues of bioresources and environmental sciences	3	108	2,0	3,0
<i>Total number</i>			468	8,7	13,0
<i>Production oriented disciplines</i>					
Master program "Agrarian Law"					
5	Legal basis of expert evaluation of lands	3	108	2,0	3,0
6	Issues of legal regulation of land mortgage	3	108	2,0	3,0
<i>Total chosen by university</i>			684	12,7	19,0
<i>Research oriented disciplines</i>					
Master program "Legal regulation of agrarian markets"					
5	Protecting the rights and interests of agricultural commodity producers	3	108	2,0	3,0
6	Possibilities of legal regulation of labor relations in agriculture	3	108	2,0	3,0
<i>Total chosen by university</i>			684	12,7	19,0
<i>2.2. Disciplines upon student election</i>					
<i>2.2.1. Cycle for professional and practical training *</i>					
1	Issues of legal regulation of activity of agrarian markets	3	108	2,0	3,0
2	Law of environmental safety	1,2	216	4,0	6,0
3	Organization of legal work in agriculture and environmental management	3	108	2,0	3,0
<i>Total number</i>			432	8,0	12,0
<i>Production oriented disciplines</i>					
Master program "Agrarian Law"					
1	Current problems of customs control of agricultural products	3	144	2,7	4,0
2	Current problems of organizing and conducting of judicial expertise	3	108	2,0	3,0
3	Current problems of crime prevention in the agricultural sector	3	108	2,0	3,0
<i>Total selected by the students</i>			792	14,7	22,0
<i>Research oriented disciplines</i>					
Master program "Legal regulation of agrarian markets"					
1	Legal forms of control in agriculture	3	144	2,7	4,0
2	Legal regulation of cattle breeding in Ukraine	3	108	2,0	3,0
3	Problems of realization of citizens' rights on agricultural land	3	108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№ п/п	Discipline, practice	Semester	Number		
			hours	credits	
				national	ECTS
<i>Total selected by the students</i>			792	14,7	22,0
Total number of elected part			1476	27,4	41,0
Practical training			216	4,0	6,0
Writing and defense of master's thesis			180	3,3	5,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## **Annotations of disciplines in the curriculum**

### **1. REGULATORY ACADEMIC DISCIPLINES**

#### *1.1. Cycle of humanitarian, social and economic training\**

**Business foreign language.** In connection with the integration of Ukraine into European society, the spread of networking and contacts in the field of public administration, the knowledge of a foreign language significantly increases the effectiveness of mutual partnership, contributes to understanding between the parties and strengthens the relationship between representatives of different countries. This discipline is intended to form the skills of usage of knowledge of the English language both in the daily communication of graduates with representatives of other countries on various issues in agriculture, and during preparation for participation in international conferences, projects and discussions, as well as teach students how to conduct written exchange of business information.

**Philosophy of science and innovative development.** The course covers the specifics of the philosophy of science and innovative development as a special type of humanitarian knowledge and as an academic discipline, there is provided a characteristic of the historical development of major trends and methodological techniques for solving the main problems of philosophy of science, there are considered the methodological, structural, ideological and value principles and characteristics of scientific cognition, there is conducted philosophical analysis of the specific current state of world and domestic science, the prospects for their development and interaction with other spheres of vital activities of society.

**Strategy of sustainable development of nature and society.** The discipline provides for the formation of knowledge about optimizing and harmonizing the relationship between person and environment, creating theoretically justified efforts to stabilize and improve the environmental situation in the present socio-economic conditions.

Any human activity affects the environment, and deterioration of the biosphere is dangerous to all living things, including humans. It has created the problem of preserving the biosphere of our planet. A comprehensive study of existing problems of human relationship with the environment should provide strategic approaches to addressing both immediate and prospective planetary problems of mankind.

**International legal provision of food safety.** The discipline "International legal provision of food safety" provides knowledge about economic policy of the state, which is aimed at ensuring of sustainable food production, its availability and use of by the population according to physiological norms of consumption from own production and revenues from imports. Fighting hunger is recognized as a priority of international economic cooperation, so the food problem is classified as global, since for its solution efforts of individual states are is not enough and it requires good cooperation of the international community, regardless of social and economic development.

**International standardization, certification of technology, raw materials and finished products.** At the present stage of development of society and its productive



forces standardization has become an important means to improve production efficiency and product quality. In view of the need to increase the demand for consumer goods industry in Ukraine and abroad, to increase its competitiveness, stimulate the creation of new, innovative products with unique properties inherent only to vegetable raw materials, to meet consumer demands for quality and reliability of products, including continuous growth the volume of trade between countries standardization and certification of goods, production and quality systems of enterprises in consumer goods industry is becoming increasingly important.

### *1.2 .Cycle of professional and practical training \**

**Modern issues of land law.** During the land reform there was established pluralism of ownership of land and forms of its management and constitutionally fixed the right to land ownership Ukrainian people, the right of every citizen to use it according to the law and the right to a safe and healthy environment, the integral part of which is land. The implementation of these rights is ensured through the implementation of the land and legal reform.

**Issues of environmental law.** The course aims to form a system of in-depth knowledge of the issues of legal regulation of environmental relations, environmental protection, rational natural resource management, and environmental security. The objectives of the course are to examine deeply the current system of environmental legislation and legal issues related to natural resources management.

**Theoretical issues of civil law.** The academic discipline involves learning of legal regulations, which have some positive features and direct the state efforts to meeting customer needs, providing conditions for the development of entrepreneurship, diligence, business and creative initiative, development of legal civil society where a person with dignity will feel independent.

**Current issues of agrarian law.** Involves the study of peculiarities of the formation of agricultural legislation in the modern period. Particular attention is paid to the study of the legal regulation of reformation processes of land and property relations in the countryside. We study the basic directions of state support for agricultural commodity producers, namely the system of tax incentives, loans and insurance. The ways of investment in the agricultural sector of the country as a means of removing it from the crisis.

**Administrative jurisdiction in the agricultural sector.** Academic discipline includes provisions for activity principles of administrative jurisdiction authorities in the agricultural sector, the mechanism of administrative and legal regulation of relations in the agricultural sector, the concept of subjects of administrative jurisdiction in the agricultural sector, forms and methods of execution of state executive power and the use of administrative legal responsibility in agricultural field. We study the issues of operation of individual administrative jurisdiction authorities of the agricultural sector, its structures and objectives. A special attention is paid to the functions of the Ministry of Agrarian Policy of Ukraine and its departments, state control in Agro-industrial complex.

**Pedagogy of Higher education.** Academic discipline aims at arm masters with knowledge of basic principles of organization of the educational process of higher educational institution, basic forms and methods of organization of educational and cognitive activities of students, educational work with young people, methodology and methods of experimental and pedagogical research, that have an imperishable significance for shaping of future specialist-master. The main attention at classes is paid to conscious learning of theory of pedagogy of higher school, highlighting and provision of rationalization of pedagogical justification, phenomena and facts, their scientific reasoning, formation of self pedagogical scientific thinking, search of new approaches in the

organization of educational process, analysis and generalization of pedagogical experience.

**Legal regulation of the quality and safety of agricultural products.** It studies general provisions on the requirements and standards to products of Agro-industrial complex, including the peculiarities of manufacture and sale of certain products of Agro-industrial complex. It analyzes the world experience and scientific achievements in the field of provision of quality and safety of products of Agro-industrial complex. It considers a system of bodies of state and public control for observance of the quality and safety of products for health of population, their competence, concept and realization of certification. It considers the problems of broadening in the world practice the use of food products and food staples containing genetically modified ingredients.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional and practical training \**

**Current issues of agrarian legislation of foreign countries.** The course aims to create a system of knowledge of the legal regulation of agrarian relations in the different countries of the world, to identify existing models of legal regulation of provision of food security and the mechanisms of its implementation. Objectives of the course involves the study of the current agrarian legislation of foreign countries, as well as legal regulation of issues arising in the structure of agrarian relations of countries with different legal systems.

The study of the course contributes to formation of legal thinking of students and intellectual development of the individual, taking into account Ukraine's membership in the WTO and the implementation of the course of European integration.

**Teaching methodology of law disciplines in higher educational institutions.** Complication of processes in socio-economic life of society, change of goals, objectives and functions of the state and the legal system are essential features of modern life. The aspects of human activity and society require the ability of lawyer to detect reasons for real difficulties arising in specific situations, develop the ways of their addressing. Thus legal activity requires a minimum amount of knowledge and skills not only in the field of scientific research but also in the field of implementation of the educational activity in the teaching of legal disciplines in higher educational institutions. The proposed discipline aims to familiarize the students with the main teaching methods of legal disciplines in the process of implementation of pedagogical activity in higher educational institutions.

**Issues of relations in biotechnologies.** Objectives of the course lies in the deep learning by students of law faculty of methodology of issues research in the field of biotechnologies, concept, subject and object of legal relations on the development and use of biotechnologies, problematic aspects of the formation and legal fixation of the modern biotechnology doctrine in Ukraine, legislation in the field of biotechnologies.

**Legal Issues of bioresources and environmental management.** Objectives of the course lies in learning by the students of modern researches of legal reality in the field of biotechnologies, which will be a guarantee of training of experts- researchers of those issues in the field of jurisprudence, that corresponds to the direction of work and objectives of NULES of Ukraine.

### *Production oriented disciplines*

#### **Master program “Agrarian Law”**

**Legal basis for expert assessment of land.** Formation of the land market in Ukraine requires a clear economic and legal mechanism of regulation of land relations, the important element of which is a land market. Its operation can not be effective without an assessment of land plots. Land – is a unique object on the quality of which there will always be a contradiction: between the landowner and local authorities when it relates to

taxation, between buyer and seller when the property transactions are carried out, between local authorities and landowners, then the amount of compensation upon land withdrawal for public purposes is determined.

**Issues of legal regulation of land mortgage.** It involves the study of peculiarities of formation of the land market in Ukraine, the institution of land mortgage is a part of which. It analyzes legislation, which regulates these relations, including Civil and Land Codes of Ukraine and others. Mortgage is regarded as the most effective type of provision of obligation fulfillment upon real estate that is owned and used by the mortgagor. It researches the experience of countries with developed market economies, where the pledge transactions with land plots are common, including Germany, the USA, Canada.

*Research oriented disciplines*

**Master's program “Legal regulation of agricultural markets”**

**Protection of the rights and interests of agricultural producers.** With the development of agricultural turnover of goods, the issues of protection of rights and interests of agricultural producers, development of effective mechanisms of these rights protection, legislative fixation and ensuring in practice the safeguards of the observance of the rights of agricultural producers. The legal basis for protecting of rights and interests of the agricultural producers is the Constitution of Ukraine, the Land Code of Ukraine and other laws and regulations.

**Peculiarities of the legal regulation of labor relations in agriculture.** It lies in deep learning of legal regulation of labor relations in agriculture. The arrangement of labor relations, peculiarities of payment for labour, labour safety, working hours, rest hours and other issues.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training \**

**Issues of legal regulation of agricultural markets’ operation.** Academic discipline involves the study of the peculiarities of legal regulation of the operation of agricultural commodity markets, the legal status of participants in the market relationship, the legal regulation of the market transactions of agricultural products. The important point is the determination of the legal status of agricultural market and its features compared with other markets (commodity and stock), it provides a comparative analysis of national and foreign legislation regarding the agrarian markets’ operation.

**The right to environmental safety.** It involves the study of theoretical and practical knowledge about diverse aspects of environmental security right as a branch of law and academic discipline; formation of practical skills and abilities of application of the relevant legislation in the factual practice of human rights, law enforcement, research and other activities of experts of legal profile.

**The organization of legal work in agriculture and environmental management.** Legal work in agricultural enterprises is aimed at strengthening of the law legitimacy in the agricultural sector. The academic discipline provides the study of principles and specific implementation of legal services, as a part of the organizational and administrative activity and form of provision of legal aid in agriculture. It studies the implementation of legal services by legal service in agricultural enterprises, as a condition of provision of proper operation of law enforcement bodies and, above all, public and commercial courts in the administration of justice.

*Production oriented disciplines*

**Master program “Agrarian Law”**

**Current issues of customs control of agricultural products.** The course “Current issues of customs control of agricultural products” determines and reveals the

---

methodological essence of the expertise as a specialist activity on the application of scientific and technological knowledge in the investigation of crimes. The academic discipline provides the formation of students the necessary skills in the appointment of certain types of forensic examinations as proceedings that envisages an examination by expert on the instructions of investigator or judge or material sources of evidence-based information to establish the real data and circumstances that are important for objective settlement of criminal case.

**Current issues of organization and conducting of forensic examinations.** The academic discipline “Current issues of organization and conducting of forensic examinations” provides the evaluation of the results of the study carried out in terms of forensic identification, the mechanism of marking formation, and cause-effect relationships. The methodological basis of this structure is the judicial expert study. Incidentally, the use in criminal and civil proceedings of various forms of special knowledge determines the specificity of their content.

**Current issues of crime prevention in the agricultural sector of economy.** The course of discipline “Current issues of crime prevention in the agricultural sector of economy” helps to define the essence and nature of crime, its specific features in modern Ukraine. The academic discipline provides the study of the causes and conditions of crime and its individual types, the main problems of modern criminological science and characteristics of the criminal identity and as a result the country's current concepts and programs of crime prevention. It studies the characteristics of certain types of crimes and principles for their prevention.

*Research oriented disciplines*

**Master's program “Legal regulation of agricultural markets”**

**Legal forms of control in agriculture.** The objective of the discipline “Legal Forms of control in agriculture” is: the study of the general principles of the legal forms of control in agriculture by establishing its concept, types and forms, the study of the system of current legislation that governs the present issue, the study of features of such control in various areas of agriculture: in cattle breeding, crop raising and so on.

**Legal regulation of cattle breeding in Ukraine.** The aim and objective is the development of appropriate level of knowledge on the specifics of legal regulation of cattle breeding (breeding, beekeeping, production of milk and dairy products, fish farming and fishing) and legal guarantees quality and safety of agricultural products. To analyze legal problems, to solve independently the practical situations related to the use of legislation, apply properly the provisions of norms and regulations; be able to apply at practical training norms and regulations of agrarian law, to apply the norms of law in the presence of complex and conflicting situations and so on.

**Problems of realization of civil rights on agricultural land.** With the implementation of land reform, the formation of the agricultural land market problem of citizens rights realization on agricultural land, the issue of developing effective mechanisms to protect land rights, legislative strengthening and ensuring adherence to practice safeguards these rights become very important. The legal basis for the implementation and protection of citizens' rights to agricultural land is the Constitution of Ukraine, the Land Code of Ukraine and other laws and regulations.

---

**Master Training  
in specialty “LAND MANAGEMENT AND CADASTRE”,  
Branch of knowledge “Geodesy and Land Management”**

**Form of training, licensed number of students:**

<b>– full-time</b>	<b>90</b>
<b>– correspondence</b>	<b>90</b>
<b>Term of study</b>	<b>1 year</b>
<b>Credits</b>	<b>60 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian, English</b>
<b>Qualification of graduates</b>	<b>Master of Science in Land Management and Cadastre</b>

**The concept of training**

The concept of training for specialty 8.08010103 “Land management and cadastre” aimed in training highly qualified specialists in land management, land conservation, land administration, environmental monitoring of geosystems and the state land cadastre. Training involves the formation of skills and abilities that allow Master students to solve independently complex issues of land use, land development projects and planning for environmental protection, monitoring and public control over rational use and protection of land, using modern information technologies for information on land resources.

**Production oriented master program**

***Master program “Land Management and Cadastre”***

The master's program related to the study and preparation of land use at the national and regional levels, programs and use of land, land management schemes and feasibility studies of land use and protection of lands of the administrative-territorial units, land management projects on establishing and changing the boundaries of administrative units, organizations and delineation of areas of natural conservation, recreational areas and also areas of historical and cultural significance.

**Sphere of graduates employment**

Setting the boundaries of land plots, approval of boundaries with adjacent land users, making the cadastral plan.

***Master program “Land Conservation”***

When studied in this master's program, students acquire skills and knowledge in the field of rational use and protection of land, restoration of soil fertility, increase productivity of forest land, providing special treatment of land use environmental, health, recreational, historical and cultural significance. Particular attention is paid to the learning standards and standardization in the field of land.

**Sphere of graduates employment**

Inspection activities in the field of land use and land conservation, prediction of land use changes, restrictions in land use and carry their registration.

***Master program “GIS in Land management”***

Development and filling modern cadastral information systems

---

**Sphere of graduates employment**

Modern GIS and remote sensing data necessary for carrying out work on the land, in municipal information systems, GIS management areas.

***Master program “Assessment of land and property”***

Master's program aimed at creating specialized skills and knowledge to conduct regulatory and expert monetary value of land, determine the market value of real estate of the economic value of land and quality of soil, the use of automation systems evaluation activities, the conduct of local and regional databases of market value of land and property, service of civil operations for the disposal of real property.

**Sphere of graduates employment**

Regulatory and expert evaluation of land of all categories and custom real estate.

***Master program “Geodetic-cartographic technology in land management”***

Provides training for field-geodetic mapping of land management, performance geodetic and cartographic works, land inventory, accounting and registration of land. Much attention is also paid to technology of mapping of land use, zoning maps, optimizing land use, land use cartographic modeling problems, including using GIS technology, the characteristics of the national geospatial data infrastructure and so on.

**Sphere of graduates employment**

Creation of maps of land use, zoning maps and zoning, optimizing land use, land inventory.

**Research oriented master program**

***Master Program “Geoinformation Monitoring of Land Resources”***

Provides training researchers who will own the application of modern geographic information technology, remote sensing data necessary for carrying out work on the land, in municipal information systems, GIS management areas.

**Sphere of graduates employment**

Future specialists gain knowledge in modern GIS software and computer-aided design, conducting automated cadastral system for use in land information systems in the bodies of land resources and SLC facilities.

***Master program “Cartographic Modeling of Land Use Issues”***

Provides training for research and development works possessed geodetic, cartographic and GIS technology in land management, GIS modeling methods of environmental management, and thematic atlas mapping of land resources, the use of maps in solving the problems of land evaluation, land cadastre, environmental management.

**Sphere of graduates employment**

Modeling of use of natural resources and thematic atlas mapping of land resources.

**Practical training**

Curriculum of Master training on specialty 8.08010103 “Land Management and Cadastre” has two practical trainings: production and pre-diploma practice. The practice of students is conducted to enhance the practical skills of the students by acquiring practical experience to solve production problems and the collection of materials about a specific

---

company, which are necessary to perform the master's thesis. The leading databases and practical training are: State Agency on Land Resources and its units, the Center of the State land cadastre and its regional offices, scientific research and design institutes on land use, research institutions dealing with land management, monitoring, development; land management, State Inspection for Control over the use and protection of land and its regional offices.

### Proposed Topics for Master Theses

1. Formation of territorial restrictions in land use, land management schemes.
2. Legal and technical support of state control over rational use and protection of land.
3. Agrolandscape optimization of land agricultural enterprises and administrative units.
4. The use of information technology, design and modern technology to create cadastral maps, evaluation of land and other real estate. Remote sensing for updating cadastral plans and maps.
5. Improved methods of economic and monetary value of land. Methods of soil evaluation.
6. Methods of land and real estate evaluation.
7. Analysis and evaluation of the transformation processes in land use.
8. Methods of forecasting, planning, rational use and protection of land resources.
9. Ecological and economic aspects of regulation of agricultural land.
10. Normative and expert monetary evaluation of various categories of land.

### Academic rights of applicants for a master program

Applicants with degree of Bachelor on specialty “Geodesy, Cartography and Land Management” can continue their education in the specialty area 0801 “Geodesy and Land Management”:

#### ***Specialties in the branch of knowledge 1801 “Specific categories”:***

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

### **Curriculum for specialist training of the educational and qualification level “Master” in specialty “Land Management and Cadastre”**

№	Discipline, practice	Semester	Number		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Scientific foreign language (Business Foreign Language)	1	54	1,0	1,5
2	Pedagogy of Higher School	2	36	0,7	1,0
3	Commercial and Labor Law	1	36	0,7	1,0
4	Physical Education	1	36	0,7	1,0
<i>Total number</i>			<i>162</i>	<i>3,1</i>	<i>4,5</i>
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Scientific Methodology and Research Methods	2	36	0,7	1,0
2	Licensing and patenting of research output	3	36	0,7	1,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	credits	
				national	ECTS
3	Information technologies in scientific research	3	72	1,3	2,0
4	Labor safety in the field of activity	1	36	0,7	1,0
5	Civil defense	1	36	0,7	1,0
<i>Total number</i>			216	4,1	6,0
<i>1.3.Cycle of professional and practical training *</i>					
1	Management of Land Resources	2	144	2,7	4,0
2	GIS in cadastral systems	3	144	2,7	4,0
3	Legislative Support of Real Estate Cadastre	3	162	3,0	4,5
4	Land Monitoring and Conservation	2	144	2,7	4,0
<i>Total number</i>			594	11,1	16,5
Total according to regulatory part			972	18,3	27,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional and practical training *</i>					
1	The legal process of land management	2	72	1,3	2,0
2	Organization of land surveying works	3	108	2,0	3,0
3	Design engineering	2	108	2,0	3,0
4	The land market and real estate	2	72	1,3	2,0
5	Economics of land use and land management	3	108	2,0	3,0
6	Philosophy of science and innovation development	1	54	1,0	1,5
7	Strategy for sustainable development of nature and society	1	36	0,7	1,0
8	State Examination of land management decisions	1	36	0,7	1,0
9	Agricultural, land and environmental law	1	36	0,7	1,0
10	International standards and certification technologies, raw materials and finished goods	1	36	0,7	1,0
11	Higher Education and the Bologna Process	3	54	1,0	1,5
<i>Total chosen by university</i>			720	13,4	20,0
<i>2.2. Disciplines chosen by students</i>					
<i>2.2.1. Cycle of professional and practical training *</i>					
<i>Production oriented disciplines</i>					
Master program "Land Management and Cadastre"					
1	Automation in land management	1	72	1,3	2,0
2	Planning Development of Territories	1	90	1,7	2,5
3	Standardization and Regulation of Land Management	2	126	2,3	3,5
4	Quality Management of Land Management Projects	3	72	1,3	2,0
5	Management of Municipal Lands	3	72	1,3	2,0
<i>Total selected by the students</i>			486	9,0	13,5
Master program "Land Conservation"					
1	Formation of agrolandscapes	1	72	1,3	2,0
2	Evaluation and forecast of land quality	1	90	1,7	2,5
3	Environmental impact assessment of land use planning decisions	2	126	2,3	3,5
4	Technological aspects of land use	3	72	1,3	2,0
5	Prediction of land use	3	72	1,3	2,0
<i>Total selected by the students</i>			486	9,0	13,5
Master program "GIS in land management"					
1	Information Modeling and programming in land management	1	72	1,3	2,0
2	Methods of remote sensing in land management	1	90	1,7	2,5



**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	credits	
				national	ECTS
3	GIS analysis and geostatistics applied to land management	2	126	2,3	3,5
4	Geoprocessing tools	3	72	1,3	2,0
5	GIS of Natural Resources	3	72	1,3	2,0
<i>Total selected by the students</i>			486	9,0	13,5
<b>Master program "Evaluation of Land and Property"</b>					
1	Information support of monetary evaluation of land	1	72	1,3	2,0
2	Registration of ownership	1	90	1,7	2,5
3	Landscape science basics of land management	2	126	2,3	3,5
4	Real Estate Evaluation	3	72	1,3	2,0
5	Regulatory and expert assessment of land parcels	3	72	1,3	2,0
<i>Total selected by the students</i>			486	9,0	13,5
<b>Master program "Geodetic-Cartographic Technologies in Land Management"</b>					
1	Computer technologies of mapping	1	72	1,3	2,0
2	Cartographic supply of land management	1	90	1,7	2,5
3	Topographic, geodetic and cartographic supply of land management	2	126	2,3	3,5
4	Thematic Mapping: maps of land cover and use	3	72	1,3	2,0
5	Modeling in Cartography	3	72	1,3	2,0
<i>Total selected by the students</i>			486	9,0	13,5
<b>Research oriented disciplines</b>					
<b>Master Program "Geoinformation monitoring of land resources"</b>					
1	Methods of remote sensing	1	72	1,3	2,0
2	Geospatial databases	1	90	1,7	2,5
3	Analysis of spatial data	2	126	2,3	3,5
4	Multivariate analysis techniques	3	72	1,3	2,0
5	GIS monitoring of natural resources	3	72	1,3	2,0
<i>Total selected by the students</i>			486	9,0	13,5
<b>Master program "Mapping Modeling land use issues"</b>					
1	Computer technology mapping	1	72	1,3	2,0
2	Mapping supply of land management	1	90	1,7	2,5
3	Mapping as a method of research	2	126	2,3	3,5
4	Thematic mapping: map land resources	3	72	1,3	2,0
5	Mapping of Natural Resources	3	72	1,3	2,0
<i>Total selected by the students</i>			486	9,0	13,5
<i>Total number of elected part</i>			1206	22,3	33,5
<i>Practical training</i>			576	10,6	16,0
<i>Writing and defense of master's thesis</i>			486	9,0	13,5
<i>Total for specialty</i>			3240	60	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

*1.1. Cycle of humanitarian, social and economic training\**

**Scientific foreign language** (Business Foreign Language). The objectives of studying discipline - to form students' abilities and skills of business communication in a foreign language on level of an autonomous power user (C1), which provides the

necessary communicative competence in professional work in oral and written forms, mastering the latest professional information through foreign sources.

**Pedagogy of High School.** The general principles of pedagogy of high school, especially its development in a historical perspective, the philosophy of education of the XXI century, laws, principles, forms, tools and methods of the educational process in higher education, research and educational work with students. With present-day position opened requirements for teachers of higher educational institution. Each topic equipped list of recommended literature, tasks for independent work, tasks and questions for self-study of theoretical material.

**Economic and Labor Law.** The aim of the course - students form a system of theoretical knowledge and practical skills in the application of labor legislation, the development of the main provisions of the legal regulation of economic activity, clarifying the legal status of entities, the principles of business

**Physical Education.** Basic principles of a healthy life. Estimation of physical training level of a person. Increasing person's physical capacities.

### *1.2. Cycle of natural science (fundamental) training\**

**Methodology and methods of research.** Scientific research in land use affect the growth of the social product. The results of research in land management is an intermediate product production. But their role in the organization of land relations and land use in the economy is significant. Addressing socio-economic and investment programs requires appropriate training of highly qualified personnel who have owned the methodology and methods of scientific research on the problems of rational use and protection of land, land management, economics, land use and land management, new manufacturing and information technology, management and marketing in land management.

**Licensing and patenting of scientific production.** The purpose of discipline is to master knowledge in the formation of patent licensing, copyright and related rights. The ability to use knowledge for the preparation of applications for industrial property rights and patents for the protection of copyright in works of scientific and technical purposes with the requirements of national and international laws and regulations in the field of intellectual property.

**Information technology in scientific research.** Discipline involves in-depth study of organizational and methodological foundations of information technology in research work, logic and stages of information research works, sources of information, design and implementation of others.

**Safety in the industry.** The discipline that studies the system of legal, socio - economic, organizational - technical, sanitary - hygienic and medical-preventive, aimed at maintaining a healthy and safe working environment professionals in the industry. Course Objective - to provide future engineers and technicians (environmental) knowledge and skills in a safe and friendly working environment in the industry.

**Civil defense.** The discipline that studies the theoretical, scientific, technical, technological, economic, environmental, social and political problems that disrupt normal life and activity of people in a specific area (basin) or objects on it (the objects on the sea) due to accidents, natural disasters or dangerous event that led or may lead to the inability to communities living on this territory or facility, conducting an economic activity, loss of life or significant property damage.

### *1.3. Cycle of professional and practical training \**

**Land Management** is a special discipline in the training of engineers and surveyors focused on the knowledge of the nature and patterns of land management, research methods and management mechanisms.

---

**GIS cadastral systems.** Discipline involves consideration of practical applications of GIS and geodata bases of cadastral systems and the acquisition of practical skills in using GIS for automated SLC.

**Legislative support of Land Cadastre.** The purpose and objectives is to develop an integrated system of property register which will lead to more effective management of real estate, improve property rights and open wider possibilities for the use of these rights will help to monitor the quality of cadastral objects and the environment, will create an objective system property taxation.

**Monitoring and protection of land.** The purpose of the discipline is learning and gaining listeners required theoretical knowledge and practical skills in monitoring land.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional and practical training \**

**The legal process in land management.** The main objective of the discipline is the study of procedural order of land management activities in relation to: the transfer of land ownership and provision for use of natural and legal persons; withdrawal (redemption) of land, privatization of land, the sale of land to individuals and companies, regulatory fees ground, the creation and operation of the farm, land acquisition, the formation of farms and so on.

**The organization of land management projects.** Discipline is based on the provisions of economics that studies the scientific methods of organizing and planning production activities in the field of land management.

**Executive projects in Land Management.** The aim of the discipline is to develop theoretical knowledge and its practical application in external and internal organization of land ownership, land use: and rational allocation of blocks, cells, working in areas of areas of perennial crops, vineyards, collective gardens, shelterbelts design, placement constructions for cattle , designing erosion waterworks, with terracing of slopes, land reclamation, etc..

**Land market and real estate.** Purpose - study of, basic functioning of the land market and real estate and use the knowledge gained in practical tasks. Students should be aware of the regulatory and legal framework for the functioning of the land market mechanisms mortgage have knowledge on how the alienation of land and real estate, to be able to analyze and use information.

**Economics of land use and land management.** Based on objective economic laws, a system of socio - economic and environmental measures aimed at implementing the provisions of the land laws, develop the methodology and techniques of effective reasoning and rational land use and protection of various categories, forms and types of land use, administrative - territorial units, by region and country as a whole. Includes patterns and specific guidelines for the explanation of design decisions on the improvement of the territory of the administrative-territorial units, land ownership and land use, territorial organization of agricultural and other industries under the conditions of different regions and ownership of land.

**Philosophy of science and innovation.** The object of study is the general patterns and trends of scientific knowledge as a special activity for the creation of new scientific knowledge, taken in their historical development and under consideration in the historically changing social and cultural context.

**Strategy of sustainable development of nature and society.** The purpose of discipline is to explore the key problems of interaction between humans and the environment in terms of policies and strategies for sustainable development.

**State expertise of land management decisions.** The purpose of discipline is to develop knowledge and ownership regulations on relevant research, analysis and

---

evaluation of land documents for compliance with legal requirements, set standards, rules, regulations for objects of expertise.

**Agricultural, land and environmental law.** The course aims to create a system of knowledge of the legal regulation of agrarian relations in Ukraine, legal support agrarian and land reform, to determine the peculiarities of legal regulation of food and environmental safety, and mechanisms of its implementation.

**International standardization and certification technologies,** raw materials and finished products. Major International Organization for Standardization. Goals, objectives, functions, International Organization for Standardization. Objects and priorities of the International Organization for Standardization.

**Higher Education and the Bologna Process.** Learning courses designed to provide students with research and teaching expertise essence of the functioning and development of the European education system on the basis of Boulogne Declaration prepare them for self-education, self-help and self-determination.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical training \**

#### *Production oriented disciplines*

#### **Master program “Land management and cadastre”**

**Automation in Land Management.** The need to quickly and efficiently perform land surveying work in the new socio-economic environment requires a broad application of the principles of formation and organization of scientific research, automated methods for the design and conduct of a database and the data in the field of land surveying. The development of modern land management is defined by methods and research means that is currently being improved, especially in connection with the use of a systematic approach, mathematics, computing and computer technologies. Land management is inextricably linked with the new progressive area of research - automation land management that occurred at the intersection of land management, economics and mathematical modeling in land management, geoinformatics, mathematics and other sciences.

**Planning Development of Territories.** The purpose of discipline is mastering modern scientific aspects of territories development, to further implement them in practice. Improve previously acquired knowledge and apply new techniques in this field.

**Standardization and Regulation of Land Management.** The purpose of discipline is: development of general knowledge on standardization and regulation of land management to conserve land resources, soil fertility, implementation and development of sustainable land use, land protection and protection of the environment in general, the definition of the main goals and objectives in the regulation of anthropogenic pressures on ecosystems is general and land resources partially, the definition of the structure and mechanisms of formation and functioning of standardization and regulation system (SRS), the definition of priorities for creating SRS, ensuring governance in process of creation and revision of existing international, national and industry standards and regulations regarding sustainable land management, land use and land protection.

**Quality Management of Land Management Projects.** The aim and purpose of discipline is the development of socio-economic activities in the program, project and working land documents that would ensure sustainable use and protection of land, the creation of the environment and improve the natural landscape with the introduction of the scientific organization of labor in the land management process, improving the quality of practical solutions and project documentation as a whole.

---

**Management of Municipal Lands.** For effective land management it's necessary to justify allocation of land for the intended purpose and to identify approaches to differentiation (separation) of land use that are largely addressed through the drafting of land documents (projects, schemes, etc.). All this underlines the relevance of the discipline.

### **Master program "Land Conservation"**

**Formation of agricultural landscapes.** The purpose of the study of the course - the mastery of general Theoretical Foundations of environmentally sustainable agricultural landscapes, the development of methodological approaches to the assessment and prediction of agricultural landscapes, the practical application of technology design and ameliorative soil-dimensional structure of agricultural landscapes.

**Assessment and prediction of land quality.** Purpose of the discipline - the development of modern methods of assessing the quality of land, the forecast change their state under the influence of natural and anthropogenic factors, basis for the preservation and restoration of ecological values of natural and acquired qualities of land on different natural and economic conditions of areas of land use.

**Environmental impact assessment of land use planning decisions.** The course aims to develop in students have a professional approach to solving specific practical problem of the protection and rational use of land resources, environmental impact assessment of projects land.

**Technological aspects of land use.** The course reviews relations between the agricultural domain and the natural environment, helps to develop new approaches and principles of agricultural production on different soil and climatic conditions with minimal energy and material resources to carry out measures to predict and rationalize the use and protection of land, regardless of ownership and management

**Prediction of use of land resources.** The course is designed to help master the theoretical knowledge and practical skills of agroecological research in different soil-climatic zones of the study of the causes of degradation phenomena, assessment of the extent of their distribution and performance measures for their prevention, conducting environmental and agrochemical land evaluation

### **Master program "GIS in land management"**

**Information modeling and programming in land management.** The course provides learning basic programming skills in C + +.

**Methods of remote sensing in land management.** Discipline involves consideration of remote sensing techniques and the possibilities of using contextual interpretation of results in problems of territory management and monitoring.

**GIS analysis and geostatistics applied to land management.** The discipline involves the study of the theoretical foundations of GIS analysis and provides practical skills to use spatial analysis and geostatistics in land management.

**Geoprocessing tools.** Spatial data features are reviewed in the course as well as main models of their displaying and operations with geodata in ArcInfo.

**GIS of natural resources.** Practical application of GIS technology for the purposes of natural resources monitoring and land management, application of geoprocessing procedures for research of natural resources is reviewed.

### **Master program "Evaluation of land and property"**

**Information support of monetary evaluation of land.** The aim of the course - mastering future specialist surveyors nature of information aspects land evaluation and use of information technologies in the implementation of evaluation. Determination of the real, fair value is essential for taxation and privatization of land and property transactions

---

about the land and rights of its lease on the secondary market. In addition, the value of land is required for the development and implementation of investment projects, obtaining loans secured by real estate.

**Registration of property rights.** Purpose - to study methods of registration of title to land is required at the conclusion of civil agreements on land, including - sales transactions, rent relations, for the purposes of monitoring - monitoring system as the rights of ownership of land in order to timely detect changes in their assessment, prevention and elimination of negative effects, as well as public accounting.

**Landscape science basics of land base.** The aim of the course is to teach students landscape science principles and methods of research in the field of land management. This course content should cover the basics of Landscape and Landscape Research methodology, methodological approaches to address specific environmental issues, identifying areas of applied research landscapes and their effectiveness in good housekeeping, setting up experiments, summarizing research results landscapes in targeted reports, advanced techniques and applications recommendations.

**Real Estate Evaluation.** Purpose - to learn to identify the objective market value of the property, which usually depends on the type of the property, the location of the property, the cost of construction of similar facilities, the general level of prices, the market situation.

**Regulatory and expert assessment of land.** Discipline is designed to give students the necessary knowledge that will enable them to have the implementation of regulatory and expert monetary value of land, including determining the impact that assessment has on the development of land relations. Study courses should prepare students for further creative thinking and solutions to practical and methodological problems associated with the assessment of land in specific circumstances.

#### **Master program “Geodetic-cartographic technology in land management”**

**Computer technology in cartography.** The task of the discipline dates required theoretical knowledge of modern computer technology to teach methods of their use in the creation and design of maps, acquire skills and abilities while learning specialized software products that are used in the creation of cartographic products used in land surveying; familiarize students with technological features phases of cartographic products (plans, drawings and maps).

**Cartographic supply in land management.** We consider some elements of the theory of cartography, map projections and ways of maps used in land management. Posted technique to create and update planning and cartographic material for the purposes of land. The use modern computer technology and software in solving problems of land use mapping are reviewed.

**Topographic-geodetic and mapping supply of land management.** The task of the discipline: to give information on the current legal and organizational framework for the establishment and development of national infrastructure geospatial data gain skills and ability to use geospatial data in land management.

**Thematic mapping: map of the land and its use** - covers the basics of thematic mapping. Served classification of thematic maps and legends develop ways according to their types. Are explained ability to display a variety of objects, processes and phenomena through different ways of maps. The basic methods of creating thematic maps and their basic content and methods of their execution and coordination.

**Cartographic Modeling in Land Management** covers the basics of cartographic modeling and simulation tools in cartography. Served methods and guidelines simulations in cartography. Are explained in the nature of a sign system mapping, mathematical function, mapping and GIS mapping, the main task of modeling and thematic mapping

---

problem. Considered and solved some problems creating models of objects, processes and phenomena both natural and socio-economic.

*Research oriented disciplines*

**Master's Program “Geoinformation monitoring of land resources”**

**Methods of remote sensing.** Discipline involves consideration of remote sensing techniques and the possibilities of using contextual interpretation of results in problems of territory management and monitoring.

**Geospatial databases** review the features of the hierarchical, network, relational and object-oriented database models. We study the design of relational databases, relational algebra, functional dependencies and normalization, the basic elements of SQL and the use of ER-diagrams and UML for building database structures.

**The analysis of spatial data.** Students gain practical experience in conceptual, logical and physical data models, content database attributes constructing spatial component of the vector-based topological model and application requests to the spatial component.

**Multivariate analysis techniques.** Classification of spatial analysis functions. Overlay operations: types of overlay operations, the structure of input and output data, polygon overlay methods. Network analysis. Techniques and methods of statistical analysis. Examples of implementation in the GIS tool.

**GIS monitoring of natural resources.** We consider the practical application of GIS technology for monitoring natural resources and land management, application procedures geoprocessing the study of land and water resources, flora and mineral resources of use of software package ArcGIS.

**Master program “Mapping Modeling land use issues”**

**Computer technology in cartography.** The discipline provides the theoretical knowledge and practical skills in the study of the application of modern technologies for their use, acquiring the ability to use methods and techniques of design, creation and update maps and other cartographic items on land management based on computer technology.

**Cartographic supply in land management.** We consider some elements of the theory of cartography, map projections and ways of maps used in land management. Posted technique to create and update planning and cartographic material for the purposes of land. The use modern computer technology and software in solving problems of land use mapping is reviewed.

**Cartographic research method.** “Mapping method of investigation” in the land surveying profession provides skills acquisition card reader and how to use them, learning different techniques and methods of analysis of maps and other cartographic models based on modern technologies.

**Thematic mapping: maps of land resources.** The task of the discipline: to give the necessary theoretical information about the visual, graphical, mathematical, GIS techniques and methods of analysis maps to teach the method of their application using maps, acquire skills and abilities in mastering the techniques and methods of analysis of the maps that are used to create them on the basis of other cartographic models, familiarize students with the features of levels and stages using maps.

**Mapping of natural resources.** Landscape science and landscape research are aimed at identifying the nature of the human impact on the environment. Preparation of forecast maps, the resulting integrated map of the environment is reviewed in the course.

**EDUCATION AND RESEARCH INSTITUTE  
OF BUSINESS**

**Director** – Doctor of Economic Sciences, Professor Dibrova Anatoly Dmytrovych  
**Tel.:** (044) 527-85-40  
**E-mail:** dibrova@nubip.edu.ua  
**Location:** building № 10, room 301

**FACULTY OF ECONOMICS**

**Dean** – PhD, assistant professor Kaminska Tetiana Grygorivna  
**Tel.:** (044) 527-80-06  
**E-mail:** economy\_dean@twin.nauu.kiev.ua  
**Location:** building № 10, room 313

**Faculty trains Masters in the specialties:**

***8.03050401 “Economics of Enterprise”***

**Department in charge of training graduates:**

**Of Economics of enterprise**

**Tel.:** (044) 527-89-78

**E-mail:** dibrova@nubip.edu.ua

**Head of Department** – Doctor of Economic Sciences, Professor Dibrova Anatoly Dmytrovych

***8.03050801 “Finance and Credit”***

**Department in charge of training graduates:**

**Of Finance and Credit**

**Tel.:** (044) 527-87-59

**E-mail:** tax\_chair@twin.nauu.kiev.ua

**Head of Department** – Doctor of Economic Sciences, Professor Khudoliy Lyubov Mykhailivna

***8.03050803 “Taxation”***

**Department in charge of training graduates:**

**Of Taxation**

**Tel.:** (044) 527-87-59

**E-mail:** tax\_chair@twin.nauu.kiev.ua

**Head of Department** – Doctor of Economic Sciences, Professor Khudoliy Lyubov Mykhailivna

***8.03050901 “Accounting and Auditing”***

**Department in charge of training graduates:**

**Of Accounting, analysis and audit**

**Тел.:** (044) 527-83-61

**E-mail:** book-keep\_char@twin.nauu.kiev.ua

**Head of Department** – Doctor of Economic Sciences, Professor Kalyuha Eugenia Vasylivna

**FACULTY OF AGRICULTURAL MANAGEMENT**

**Dean** – Doctor of Economic Sciences, Professor Ohrimenko Igor Vitalijovych

**Tel.:** (044) 527-85-73

**E-mail:** agromen\_dean@twin.nauu.kiev.ua

---



**Location: building № 10, room 108**

**Faculty organizes the training of masters in the specialities:**

***8.03050701 “Marketing”***

**Graduating department:**

**Of Marketing and International Trade**

**Tel.: (044) 527-89-78**

**E-mail: [market\\_chair@twin.nauu.kiev.ua](mailto:market_chair@twin.nauu.kiev.ua)**

**Head of Department – Doctor of Economic Sciences, Professor Chebotar Sergiy Ivanovich**

***8.03060101 “Management of Organization and administration”***

**Graduating department:**

**Of Management named after. prof. Y.S. Zavadskoho**

**Tel.: (044) 527-84-80**

**E-mail: [manag@twin.nauu.kiev.ua](mailto:manag@twin.nauu.kiev.ua)**

**Head of Department – Doctor of Economic Sciences, Professor Horovyy Vasyl Pavlovych**

***8.03060104 “Management of Foreign Economic Activities”***

**Graduating department:**

**Of World Agriculture and International Management**

**Tel.: (044) 527-86-51**

**E-mail: [worldagro\\_chair@twin.nauu.kiev.ua](mailto:worldagro_chair@twin.nauu.kiev.ua)**

**Head of Department – Doctor of Economic Sciences, Professor Halushko Valeriy Pavlovich**

***8.18010018 “Administrative Management”***

**Graduating department:**

**Of World Agriculture and International Management**

**Tel.: (044) 527-86-51**

**E-mail: [worldagro\\_chair@twin.nauu.kiev.ua](mailto:worldagro_chair@twin.nauu.kiev.ua)**

**Head of Department – Doctor of Economic Sciences, Professor Halushko Valeriy Pavlovich**

---

**Master Training  
in specialty “ECONOMICS OF ENTERPRISE”  
Branch of knowledge “Economics and Entrepreneurship”**

**Form of training, licensed number of students:**

– full-time 60

– correspondence 60

**Term of study** 1 year

**Credits** 60 ECTS

**Language of teaching** Ukrainian

**Qualification of graduates** master's degree in economics of enterprise

**The concept of training**

The transition to a market economy, reform of property relations necessitated a radical restructuring of curricula, targeting them for deeper meaning and improve the quality of vocational education.

The introduction of speed training in higher school must promote the resolving of this important task.

Master's stage of training in economics of enterprise is distinguished with qualitatively new curricula and programs, innovative forms of educational process that focused on providing a high level of theoretical knowledge, directly involved in the research and approbation of the results in practice, acquirement of scientific and methodological foundations of educational activities.

Master in economics of enterprise must be an expert with the general level of education and culture to the international standards, which has sufficient intellectual capacity to a wide selection of specific areas of practice.

**Production oriented master program**

***Master program “Business planning of production activities in agriculture”***

Increase of efficiency of agricultural business is an important area of economic growth in Ukraine. Inefficient use of natural resources, labor and productive capacity are continued in agriculture. Efficient use of resources depends on a large number of different organizational and economic, technical and financial factors, which leads to the need for real justification for every investment project of current or newly established companies. The experience of foreign and domestic enterprises shows that in the market conditions stable business success can not be achieved without making business planning. It helps to allocate management efforts by priorities, rationally allocate the necessary resources and optimize the economic performance of the enterprise. These problems must be faced by high-qualified economists. Their competence level of knowledge acquired in business planning of production activities affect on solving of practical problems related to the efficiency of doing business in agricultural enterprises.

**Sphere of graduates employment**

Managers and assistants of economic departments of companies, associations, firms of agriculture etc.

***Master program “Organization of production services for enterprises of agricultural sector”***

Modern highly productive agriculture is impossible without significant infrastructure essential element of which is a system of production services and logistics. Close combination and mutually beneficial functioning of productive and service sectors objectively conditioned by the social division of labor and commodity-money relations.

Therefore, due to modern tendencies of development of the economy arises demand for professionals who would have knowledge of the service economy, would be able to project, organize and effectively manage the business in this area.

This master program is aimed at training of highly qualified specialists and economists for the serving agriculture sector.

It involves the study of logistics farms, determination of the optimal technological demand for different types of agricultural inputs, pricing on them and the formation of market rates for production services. The development of modern approaches to the formation of mutually beneficial economic relations across the "agriculture producer - production services." Using the latest scientific and technological progress and modern economic-mathematical methods of optimizing the use of production resources and rational construction of industrial maintenance and logistics.

**Sphere of graduates employment**

Managers and assistants economic departments of companies, associations, firms serving agricultural areas of different ownership etc.

***Master program “Socio-economic development of rural areas”***

With the dismantling of the administrative-planned system of economy the system of socio-economic development of the Ukrainian village has been actually disintegrated. In the country there was no system of training of these problems. In the transition to a market economy the problem of balanced development of the rural sector as a prerequisite for the release of agricultural economy out of crisis and ensuring food safety, the government has become priority. It is further enhanced by the fact that the market conditions have changed the mechanisms and levers of economic and social development of rural areas. Experts who now are dealing with these problems, do not have the skills in-depth analysis of the processes occurring in the agricultural sector, and the more they are able to identify priorities, develop a set of measures and instruments to justify their implementation to inhibition of negative trends and improve the economic, social, demographic and ecological situation in the country. There is an urgent need to make a difference and start producing the required specialists, so the study of the program allows for a deeper and wider understanding of the issues and trends in the rural sector at present, teaches the skills of prediction and selection of effective methods and ways to mitigate and overcome existing disparities and enhance sustainable rural development in the conditions of market relations.

**Sphere of graduates employment**

Head of village councils, district and regional specialists departments of agriculture administration.

***Master program “Analytical justification of strategy of development of economic entities”***

In the conditions of globalization challenges for the national economy in the face of deteriorating resources for businesses, the strategy of development should contribute to the achievement of their goals and objectives with minimal resources and funding, the least risky production. Justify and implement such a strategy can only specialists who

---

possess the methodology of economic analysis and forecasting, allowing management decisions under uncertainty and risk.

Methodology for economic analysis and forecasting, synthesizing knowledge of economics, statistics and mathematics, allows you to determine the system parameters that fully characterize the activities of managed objects, to identify the shape and nature of interdependence and mutual influence between the factor and effective features, quantify the impact of various factors the change of performance indicators, to provide the necessary information selection, development and implementation of strategic enterprises subordinate objectives of the market. The prediction is based on the latest assessment of the situation and taking into account market conditions, identifying and assessing trends interacting factors and justification of areas of the development of the sector or the market as a whole. The basis of the forecast is the results of both the past and present condition of the test market that can help you to develop both current and long-term strategic forecast.

Strategic forecast assumes identification of trends macroeconomic conditions, structural changes in the economy, changes in consumer needs and changes in prices and indices of credit and monetary areas, identify new product markets.

In the short-term forecasts the main focus is on quantitative and qualitative indicators of the market situation, the assessment of production, supply and demand of the product, competitiveness of price and exchange rate.

Mid-term and long-term forecasts of commodity market forecasts are based on a system of their own market, its components and the factors influencing it, which determine the fundamental market trends. The longer the planning horizon, the less accurate is the forecast.

Most often in practice are optimistic, pessimistic and average forecasts of the market, thus reducing the risk of receiving unnecessary administrative decisions on the development of industrial and commercial activities of the analyzed company.

### **Sphere of graduates employment**

Agricultural enterprises of various forms of economic activity.

#### ***Master program "Economics of the agricultural sector"***

Reform of the Ukrainian economy and its transition to market principles of demand to develop new areas of economic science and practice. The issue creation of the market at the micro level, ie at the level of the enterprise.

Under these conditions, the successful development of the agricultural sector is based on competent study of market requirements, creation and production of competitive products, providing superior returns. The total sectorial approach has important advantages over traditional projects and programs, as increases the responsibility of the executor in the study of problems at the regional and national levels, fully taking into account aspects of sectoral policies and government regulations. However, it is necessary to educate the Master of sufficient standards of public accountability, which in the future will form an appropriate institutional and administrative capacity to formulate, implement and coordinate overall sectorial programs.

The concept and the overall goal of the program objectively reflect the need to improve cost effectiveness and efficiency of the agricultural sector. Today there is a great need for training highly intelligent, educated professionals in their field. Masters must learn to take the initiative and resolve social and personal problems. Previously it was a system focused only on production, then it now becomes a system designed to generate revenue and enhance the rural population.

---

### **Sphere of graduates employment**

Agricultural enterprises of various forms of economic activity.

#### ***Master program “Exchange operations on the agricultural market”***

With the economic development of the country well functioning stock agricultural market takes a leading role in the stabilization of the agricultural sector as a whole. By providing transparent pricing, price risk insurance, transfer of cash and cash flow, commodity exchanges are the Infrastructure instrument of commodity markets and are designed to reduce the influence of destabilizing factors on the formation mechanism of domestic prices of major agricultural products. In this regard, the range of use of agricultural tools stock exchange market every year covering more members economic relations, from producers, traders, industrial and investment companies to government institutions.

Significant changes in recent years in the global and domestic stock exchange industry, widespread adoption of computers and information technology, the transition to a market economy are putting new demands on professional training exchange business. Therefore, in order to improve the functioning of agricultural markets and the exchange of its highly qualified specialists at the National Agrarian University supported by the Ministry of Agrarian Policy of Ukraine, the Department of exchange activities open a master's program “Exchange operations on the agricultural market” (Ministry of Agrarian Policy of Ukraine № 292 from 13.06.06.)

The urgent need for the formation of the state Agricultural Trade Exchange and other commodity exchanges of the country assigned to create this master program. Implementation of a modern state strategy in the development of agricultural market exchange revealed the need for training highly qualified specialists exchange of specialization for government agencies and non-government sector.

### **Sphere of graduates employment**

Agricultural and stock exchanges Ukraine.

#### **Research oriented master program**

#### ***Master program “Economic ensure of sustainable development of agribusiness enterprises”***

Development of organizational, legal and economic conditions for innovation development of economy and improvement of agricultural production on this basis the social level as the rural population, especially, increasing its employment and income;

- The acquisition of skills in Masters of agricultural market infrastructure for innovative principles, regulation of supply and demand, quality assurance and the development of agro-industrial integration;

- Analysis of the competitive environment for the development of the agricultural sector with regard to WTO requirements, identify and support innovative processes during the implementation of the priority areas of agricultural development in modern conditions;

- Research and development of measures to improve the environmental situation. The concept of master program provides the formation of master skills in preparing business plans and integrated programs of investment and innovation of businesses in rural areas.

Social orientation of Master Program of innovative development of the agricultural sector leads to the formation of master approaches to overcome the negative processes and phenomena in the socio-economic development of agriculture and sustainable quality of life of the villagers, creating conditions for the development of business and on this basis to reduce unemployment and migration.

---

### Sphere of graduates employment

Agricultural enterprises of different forms of economic activity. Companies serving areas agricultural systems. Head of village councils, district and regional specialists departments of agriculture administration.

### Practical training

Educational and research farms of NULES of Ukraine, leading companies, associations, firms of agriculture in Ukraine etc.

### Proposed Topics for Master Theses

1. The development of agribusiness in the region and increase its efficiency.
2. Organization and prospects of development farmers.
3. Organization and economic efficiency of logistics of agricultural enterprises.
4. Improvements forms Productive Maintenance of agricultural enterprises.
5. Social and economic sustainable development of rural areas.
6. Improvements forms Productive Maintenance of agricultural enterprises.
7. Formation and economic performance of the zernoproduktov subcomplex.
8. Formation and performance of the milk product complex.
9. Economic exchange mechanism functioning regional market for agricultural products.
10. Features of formation and development of the stock market of agricultural products in Ukraine.

### Academic rights of applicants for a master program:

In addition to the specialty "Economics of Enterprise" Applicants with a bachelor of arts in the direction of "Economics of Enterprise" can continue studying *in the field of knowledge 1801 "Specific categories"*:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
- 8.18010021 – "Pedagogy of Higher School" (see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – "Educational Institution Management" (see p. 427).

### Curriculum for specialist training of the educational and qualification level "Master" in specialty "Economics of Enterprise"

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Financial Management	1	108	2,0	3,0
2	Management of staff	2	108	2,0	3,0
3	International Management	2	108	2,0	3,0
4	Management of capabilities of enterprise	2	108	2,0	3,0
5	Economic diagnosis	1	108	2,0	3,0
6	Project Management	2	108	2,0	3,0
7	Strategic management	2	108	2,0	3,0
Total according to regulatory part			756	14,0	21,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of humanitarian, social and economic training*</i>					

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
1	Business foreign language	2	72	1,3	2,0
2	Agricultural Policy	2	72	1,3	2,0
3	Management of regional development	2	72	1,3	2,0
<i>Total number</i>			216	4,0	6,0
<i>2.1.2. Cycle of professional and practical training*</i>					
1	The financial analysis in addition to "Exchange operations on the agricultural market"	2	72	1,3	2,0
2	Price and Pricing	2	72	1,3	2,0
3	Current Problems of Agricultural Economics in addition to "Exchange operations on the agricultural market"	1	108	2,0	3,0
4	Economy grocery subcomplex except "Exchange operations on the agricultural market"	1	108	2,0	3,0
5	Stock market	2	108	2,0	3,0
6	Business Planning of entrepreneurship	1	108	2,0	3,0
<i>Total number</i>			576	10,6	16,0
<i>Total chosen by university</i>			828	14,5	23,0
<b>2.2. Disciplines chosen by students</b>					
<i>2.2.1. Cycle of professional and practical training*</i>					
Production oriented disciplines					
Master program "Business Planning of entrepreneurial activity in agriculture"					
1	Design of of entrepreneurial activity in agriculture	1, 2	216	4,0	6,0
2	Agribusiness: development and evaluation	1	72	1,3	2,0
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Organization of production services for enterprises of agricultural sector"					
1	Economics and Organization of servicing sector in agriculture	1-2	216	4,0	6,0
2	Economic relations between operating and production areas	1	72	1,3	2,0
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Socio-economic development of rural areas"					
1	Socio-economic development of rural areas	1, 2	216	4,0	6,0
2	The organization of local government	1	72	1,3	2,0
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Analytical study of strategy development entities"					
1	Strategic analysis of business	1, 2	216	4,0	6,0
2	Economics of cooperative sector	1	72	1,3	2,0
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Economics of agricultural sector"					
1	Economics of of the agricultural sector	1, 2	216	4,0	6,0
2	Economics of cooperative sector	1	72	1,3	2,0
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Exchange operations on the agricultural market"					
1	Technology of futures trading	1, 2	216	4,0	6,0
2	Exchange E-commerce	1	72	1,3	2,0
3	Brokerage	2	72	1,3	2,0
4	Organization of commodity exchange market	1	72	1,3	2,0
5	Stock Exchange Law	1	72	1,3	2,0
6	Analysis and forecasting of stock market	1	72	1,3	2,0
<i>Total selected by the students</i>			576	10,6	16,0
Research oriented disciplines					
Master Program "Sustainable economic development of agribusiness enterprises"					
1	Sustainable development of agribusiness enterprises	2	108	2,0	3,0
2	Ensure the effectiveness of agricultural	2	108	2,0	3,0

## MASTER DEGREE PROGRAMS

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
	enterprises				
3	Scientific principles of self-sufficiency of rural communities	2	108	2,0	3,0
<i>Total selected by the students</i>			324	6,0	9,0
Total number of elected part			1116	20,7	31,0
Practical training			72	1,3	2,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			2160	40,0	60,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### Annotation of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### *1.1. Cycle of professional and practical training*

**Financial Management.** Developing the knowledge of financial management companies operating and investing activities of the strategy and tactics of financial entities.

**Management of personnel.** Developing the knowledge of the theory and practice of management staff of various organizations operating in the economy of Ukraine.

**International Management.** The study of modern theoretical foundations and international environment management, learning management technologies international corporations, methods to solve the key problems of development in the conditions of globalization, developing abilities to apply the methods and tools of International Management at Ukrainian enterprises.

**Management capacity of enterprises.** Exploring new approaches to the management of the formation, development, building enterprise competitiveness, efficiency of its use by modern socio-economic criteria, to justify the acquisition of skills and use mechanisms crisis prevention and crisis management entities.

**Economic diagnostics.** Providing knowledge on the use of analytical tools and economic diagnostic tools to determine the condition of the company, mastering the skills of economic diagnosis to ensure effective management.

**Project Management.** Providing knowledge on methods, techniques and tools of project management, study design principles of the company, specific methods and tools of project management, acquiring skills to perform basic functions of project management - organization, planning and control.

**Strategic management.** The acquisition of theoretical knowledge of business strategy and the skills of managing strategic change, the study of the theoretical foundations of change management methods for the analysis of resources and competencies of the enterprise, the acquisition of skills and analysis of organizational structure and enterprise culture, the influence of the agents of strategic change in the company.

#### 2. ELECTIVE ACADEMIC DISCIPLINES

##### *2.1. Disciplines chosen by University*

##### *2.1.1. Cycle of humanitarian, social and economic training\**

**Business foreign language.** Acquiring knowledge and skills. What is needed to provide students communicative ability in the areas of professional communication.

**Agricultural Policy.** Mastering the theoretical and methodological foundations formulation and implementation of agricultural policy, how to evaluate its effectiveness and justify the choice of various measures of state regulation of economic nature,



character and the main components of agricultural policy, certain measures of financial and credit, tax and price policies in the agricultural sector.

**Management of regional development.** Mastering the theoretical and methodological foundations of regional development, basic concepts, categories and methods of analysis and strategy development for the industry.

*2.1.2. Cycle of professional and practical training*

**Financial analysis in addition to “Exchange activities in the agricultural market”.** Providing of knowledge on how peer review of financial and economic activities and internal resources to strengthen the financial condition of the company. The theoretical basis of financial analysis. Overall financial condition of the company. Methods and techniques of financial analysis of agricultural Company.

**Price and pricing.** Theoretical Foundations pricing legislation and regulation pricing in agriculture, organizational and economic mechanism of pricing, description methods of regulating pricing in Ukraine kinds of prices and their classification, pricing and exchange equivalence problems in agriculture, monitoring, control prices and forecasting.

**Current Problems of Agricultural Economics in addition to “Exchange operations on the agricultural market”.** Definition prospects of the agricultural sector to the innovative development model and its ability to provide sustained rapid growth, the definition of quantitative and qualitative parameters of the agricultural sector in the future, as well as key activities through the implementation of these parameters are achieved.

**Economics of grocery subcomplex except “Exchange operations on the agricultural market”.** Shaping the economic analysis of agriculture, determining the economic efficiency of food subsectors, the use of inputs, production, processing and marketing of agricultural products, as well as consistent and logical development of modern agricultural economy related issues.

**Stock market.** Formation of knowledge on the organization and functioning of exchange trading of different types of stock market, the acquisition of practical skills: organization of trading in commodities, securities, currencies, establishment and operation of brokerage firms, the use of the exchange of information for highly efficient production and marketing of agricultural products.

**Business Planning of entrepreneurship.** Formation of theoretical knowledge and practical skills in business planning in agricultural business sector, the planning system, processes, mechanisms, technology and organization business planning business enterprises in the agricultural sector.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training\**

*Production oriented disciplines*

**Master program “Business Planning of entrepreneurial activity in agriculture”**

**Design of entrepreneurial activity in agriculture.** Formation of theoretical knowledge for the design of agricultural enterprises practical skills related to the development of technical, organizational and planning documents upon which formed and provided with operation of production systems (companies) in the field of agriculture.

**Agribusiness: development and evaluation.** It reveals the essence of agribusiness as a form of economic activity and its specificity, institutional forms of agribusiness and its legal framework, organizational and economic conditions of efficient production and management in farming, agribusiness in specific regions of Ukraine.

**Master program “Organization Productive Maintenance enterprises of the agricultural sector”**

**Economics and Organization of servicing sector in agriculture.** Formation of theoretic and practical knowledge of rational organization and efficiency of industrial maintenance and logistics of agricultural enterprises explore new approaches to the organization and management of the development of productive agricultural service enterprises, the formation of the material and technical base of agricultural production, providing research policy in the field of mechanization , electrification, automation, agricultural construction, chemicals, agricultural products processing terminal, information, technical and scientific support of production agricultural sector.

**Economic relations between operating and production areas.** Involves the study of logistics farms, pricing and marketing of formation of tariffs for industrial services, determined how to optimize utilization of resources and rational construction of industrial maintenance and logistics.

**Master program “Socio-economic development of rural areas”**

**Socio-economic development of rural areas.** Priorities and effective instruments and mechanisms to overcome the problem of depressed rural areas to diversify their economic base and creating socially attractive and environmentally friendly living conditions of the rural population, methods of analysis regarding the interdependence and interconnectedness of agriculture sector from external and internal factors in the transition economy , trained professionals able to work independently in a changing environment postplanovoyi economy.

**The organization of local government.** Learning and mastering the basics of the system of local self-government, economic nature, character and the main components of the system of local government, social and economic development of communities.

**Master program “Analytical study of strategy entities development”**

**Strategic analysis in the business.** Definition of indicators that fully characterize the activities of managed objects and to identify the form and nature of interdependence and mutual influence between the factor and effective features, quantify the impact of various factors on the change in performance indicators, to provide the necessary information selection, development and implementation of strategic enterprises subordinate objectives of the market. The prediction is based on the latest assessment of the situation and taking into account market conditions, identifying and assessing trends interacting factors and rationale for the development of the areas of the sector or the market as a whole, trending macroeconomic conditions, structural changes in the economy, changes in consumer needs and changes in prices and credit indicators and monetary and financial spheres, discovery of new product markets.

**Economy cooperative sector.** Determination of quantitative and qualitative parameters of the cooperative sector in the future, as well as key activities through the implementation of these parameters are achieved, determining the economic efficiency of the co-operative sector, utilization of resources, the study of contemporary issues related cooperative sector.

**Master program “Economics of the agricultural sector”**

**Economics of the agricultural sector.** Scientific aspects of the agricultural resource potential for sustainable production. Status and trends of agricultural production. Increased economic efficiency of agricultural production based on innovation, economic nature, character and the main components of agricultural resources, ways of improving the efficiency of agricultural production based on innovation.

---

**Economics of cooperative sector.** Determination of quantitative and qualitative parameters of cooperative sector in the future, as well as key activities through the implementation of these parameters are achieved, determining the economic efficiency of the cooperative sector, utilization of resources, the study of contemporary issues related cooperative sector.

**Master program “Exchange operations on the agricultural market”**

**Technology of futures trading.** Research and Technology organization and functioning of futures trading various kinds of futures markets, the acquisition of practical skills: design and execution of transactions in the futures market hedging and acquisition practices speculation, analysis, and forecasting futures market, the use of financial futures market instruments and exchange of information for highly efficient production and marketing of agricultural products.

**Exchange e-commerce.** Learning the basics of stock trading email, acquire practical skills: the conclusion and implementation of agreements already in electronic stock exchange, mastering the practice of hedging and speculative transactions in the international exchange of electronic platforms.

**Brokerage.** Learning the basics of organization and functioning of the brokerage firms, the acquisition of practical skills: business, the broker intermediaries mastery practice operations brokers in the stock market of brokerage firms in the domestic stock market, the study of the requirements for certification of agricultural brokers in the stock market.

**Organization of commodity exchange market.** Study of specialized knowledge in the sphere of commodity exchange market, the main range of the exchange market, the acquisition of theoretical knowledge for the organization and implementation of commodity exchange market.

**Stock Exchange Law.** Study of aspects of the law: the legal framework for trade and exchange activities, regulatory and legal framework for the functioning of exchange structures, the concept of exchange and legal features, legal characteristics of commodity and stock exchanges; conditions for concluding and implementing agreements, legislative regulation of exchange agreements, commodity trading rules and stock exchanges, regulation of stock brokering.

**Analysis and forecasting of stock market.** Research of methods to assess the situation on the stock market, the current and forecast development for the future. Generates students' knowledge of the phase analysis and prediction prospects functioning stock market.

*Research oriented disciplines*

**Master Program “Sustainable economic development of agribusiness enterprises”**

**Sustainable development of agribusiness enterprises.** The study of the efficiency of natural resources, labor and production capacity, component business planning, solving practical problems related to the efficiency of doing business in agricultural enterprises, technical, organizational and planning documents upon which formed and provided operation of production systems (firms) in the field of agriculture.

**Ensure the effectiveness of agricultural enterprises.** The study of market requirements, creation and production of competitive products, providing high yield learning components increase economic effectiveness and efficiency of the agricultural sector of the country, the economic entity, the nature and main components of agricultural resources, ways of improving the efficiency of agricultural production on the basis of innovation.

---

**Scientific principles of self-sufficiency of rural communities.** Exploring issues of sustainable development of the rural sector as a prerequisite output of agricultural economic recovery and food security, mechanisms and tools of management of economic and social development of rural areas. skills, in-depth analysis of the processes occurring in the agricultural sector, the priority areas of measures and support their implementation levers to inhibition of negative trends and improve the economic, social, demographic and ecological situation in the country. Determination of effective methods and ways to mitigate and overcome existing disparities and enhance sustainable rural development in the conditions of market relations.



**Master Training  
in specialty “FINANCE AND CREDIT”  
Branch of knowledge “Economics and Entrepreneurship”**

<b>Form of training, licensed number of students:</b>	
– full-time	<b>100</b>
– correspondence	<b>100</b>
<b>Term of study</b>	<b>1 year</b>
<b>Credits</b>	<b>60 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian, English</b>
<b>Qualification of graduates</b>	<b>master's degree in finance and credit</b>

**The concept of training**

Training is aimed at deepening the study of the theory and practice of effective management of financial activity in the agricultural sector of the economy. An important direction of this program is to focus students on independent work, the development of the creative activity of finding effective solutions to the problems studied, acquiring skills to the study of scientific literature, legislation, and on this basis, the ability to generate internal and external financial relations, effective use of financial management, successfully applied methodological tools of financial management.

Specialist on “Finance and Credit” has to master a high level of basic knowledge in the financial sector, especially information provision and management of the use of computer technology in the agricultural activities of business entities, to know and understand the basic principles of agricultural policy.

Theoretical knowledge of financial subjects must undergo testing directly to a particular company. In the master's program is necessary to provide modern advances in science and best practices, high-performance computer technology that would provide a high level of theoretical and practical training.

Practical training must equip future professionals practical knowledge in finance, professional skills and ability to work as heads of financial departments, financial analysts, financial directors.

Serious attention along with the professional study of financial work should be paid to the study of effective methods of organization and financial management companies.

Performing research, implementation of them in practice, realization of ability to think creatively is an urgent problem of future scientists.

The purpose of the master's work is to systematize, enhance and consolidate the theoretical knowledge of testing in the workplace, skills development and implementation of proposals in the practice of financial

Formation of a new type of modern economic thinking should be aimed at developing initiatives, increased business activity, creativity pathways to improving the lives of people in a market economy.

Study on the master program and training of banking of agricultural enterprises provided:

- involvement of faculty qualifications;
- use of in training new educational technologies, which provide a theoretical knowledge and practical skills required to provide financial services;
- use of flexible forms of education, individual approach to students, the possibility of combining learning with research work while writing master works under the supervision of highly qualified;

- Conduct consultative, problem theoretical and methodological training, training on financial services companies of the agricultural sector, involving students in scientific conferences on topical issues of financing activities agricultural enterprises.

Education Master's program provides training that can independently make effective decisions about the provision of financial services to entrepreneurs and creates skilled professionals in the field of finance.

### **Production oriented master program**

#### ***Master program “Banking service of agricultural enterprises”***

Agricultural enterprises are characterized by specific economic conditions related to the seasonality of production, sustained circulation of investing, inability to simple reproduction without credit maintenance, the necessity of obtaining credit in due time, while all agricultural producers and others. The specificity of the industry lies in the fact that when taken long-term lending collateral may make agricultural land. The modern banking system of Ukraine does not consider the circumstances for various reasons, including the lack of specialists of the profile.

This causes the need for masters in banking for the agricultural sector.

The purpose of the master program – providing training, which have in-depth knowledge of the basics of banking and skills to provide banking services to entrepreneurs in the agricultural sector.

#### **Sphere of graduates employment**

Managers and assistants economic departments of companies, associations, firms of agriculture etc.

#### ***Master program “Corporate Finance”***

In a market economy Ukraine rational and efficient use of financial resources gained paramount importance. The market economy, based on the theory and practice of management, can not cover the financial sector, as management of problems businesses depends primarily on making sound financial decisions. So for finance professionals it is very important to have skills of methodological tools of financial management, cash flow management skills, methods of system approach to management of profit, capital and investment skills of analysis of financial statements, internal prediction and planning.

#### **Sphere of graduates employment**

Managers and assistants economic and financial departments of companies, associations, firms serving agricultural sphere of different forms of ownership etc.

#### ***Master program “Insurance Business”***

Insurance market of Ukraine gradually developed especially noticeable changes in its segment such as agricultural insurance. For farmers and other participants in the agricultural market need for insurance protection is not in doubt – it is related to possession of a wide range of objects and their characteristics, which is unique to farmers and other agricultural formation. Objects of agricultural insurance carriers are at risk of loss and damage as a result of certain adverse events, including climatic. Thus, biological assets have specificity of insurance: underwriting characteristics, maintenance of insurance contract, claims handling.

In the current insurance market it is offered a small number of insurance services for the agricultural sector. It is also the result of the fact that insurance companies are engaged in the agricultural insurance sector is not equipped to fully specialists who previously trained at agricultural colleges and have relevant work experience. The essence

---

of agricultural insurance, its legal basis, state support for study by students of higher educational institutions of agricultural areas.

The purpose of the master program – providing training, which have in-depth knowledge of the insurance business fundamentals and skills to provide insurance guarantees to entrepreneurs in the agricultural sector.

### **Sphere of graduates employment**

Managers and assistants economic and financial departments of companies, associations, firms serving agricultural srhere of different forms of ownership etc.

#### ***Master Program “Exchange operations on the financial markets”***

The main tasks that relate to the master's program “Exchange operations on the financial market” is a trained financial profile for the stock market of Ukraine. In addition to performing the functions of workers in the financial services markets, graduates of master's programs must possess the skills to do stock trading financial instruments both on domestic markets and in the global trading networks. Thus, conceptually this master's program provides financial staffing segment commodity exchange market and stock market financial instruments.

As a result of training under this master program students should know: the nature of the exchange, the legal framework and regulatory system stock trading, exchanges of organizational principles and mechanism of their operation, the implementation of technology exchange operations.

In practical terms, students should learn to: organize the relationship between companies and various financial institutions for exchanges and brokers, to stock transactions and determine their effectiveness, successfully use of stock information in their activity.

### **Sphere of graduates employment**

Managers and assistants economic and financial departments of companies, associations, firms serving agricultural srhere of different forms of ownership etc.

### **Research oriented master program**

#### ***Master program “Scientific Support of the financial mechanism and financial services for agribusiness”***

In the process of transition to a market economy, the expansion of financial services in the agricultural sector increased demand for qualified finance professionals. As professionals of this sphere is very important possession of methodology, methods and techniques of financial and economic research. Despite notable advances in the field of finance, there is still a number of unresolved issues, particularly during the financial performance of agricultural enterprises. This causes an acute need for masters research direction for agricultural enterprises.

Training of highly qualified personnel for research in banking agricultural enterprises and agricultural mortgages, which have profound theoretical and methodological foundations of banking and skills to provide insurance services to entrepreneurs in the agricultural sector.

For the smooth functioning of the insurance system in general and including agriculture, there is an urgent need for a solid theoretical research and development based on these teaching materials that will enhance and improve insurance protection of property interests of policyholders in agriculture.

---

### Sphere of graduates employment

Managers and assistants of economic and financial departments of companies, associations, firms serving agricultural sphere different forms of ownership etc. Experts of departments of regional and district offices of agriculture administrations.

### Practical training

Educational and research farms of NULES of Ukraine, leading companies, associations, firms of Ukraine agribusiness, banking institutions Ukraine (CJSC “Private Bank”, JSCB “Pravex-Bank”, CB “Delta”, “Raiffeisen Bank Aval”, Bank “Nadra”) etc.

### Proposed Topics for Master Theses

1. Loans of agricultural enterprises banks.
2. Settlement services of agricultural enterprises banks.
3. Cash Management in the enterprise.
4. Management of financial stability of the enterprise.
5. Insurance in the risk management system of the enterprise.
6. Insurance of crops.
7. Mutual funds and their functioning in the international financial exchange market.
8. Features and prospects of development of on-line trading in global financial markets.
9. Development of long-term bank loans of agricultural enterprises.
10. Financial aspects of expert monetary value of agricultural land.

### Academic rights of applicants for a master program:

In addition to specialty “Finances and Credit” and applicants with a bachelor of arts with a specialty “Finances and Credit” can continue their education in the specialty in field of **“Economics and Entrepreneurship”**:

- 8.03050803 – “Taxation” (see p. 358);

specialities in field of knowledge 1801 “Specific categories”:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

### Curriculum for specialist training of the educational and qualification level “Master” in specialty “Finance and Credit”

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of professional and practical training*</i>					
1	Financial Management	1	108	2,0	3,0
2	Management of staff	2	108	2,0	3,0
3	International Management	2	108	2,0	3,0
4	Strategic Management	2	108	2,0	3,0
5	Financial Services Market	1	162	3,33	5,0
6	Management of of financial sanitation of the enterprise	1	162	3,33	5,0
Total according to regulatory part			792	14,67	22,0



**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	72	1,33	2,0
2	Agricultural Policy	1	72	1,33	2,0
<i>Total number</i>			144	2,67	4,0
<i>2.1.2. Cycle of professional and practical training*</i>					
1	Tax management	2	108	2,0	3,0
2	Mortgage Lending	1	108	2,0	3,0
3	Stock market	1	72	1,33	2,0
<b>Master program "Banking service of agricultural enterprises"</b>					
4	International payments and foreign exchange transactions	1	108	3,0	3,0
5	Budget management	1	108	3,0	3,0
6	Analysis of Investment Projects	2	108	3,0	3,0
7	Monetary Policy and the National Bank of Ukraine	2	54	1,5	1,5
8	International Finance	2	54	1,5	1,5
<b>Master program "Corporate Finance"</b>					
4	Methodology financial and economic studies of agricultural enterprises	1	108	2,0	3,0
5	Budget management	1	108	2,0	3,0
6	International Finance	2	54	1,0	1,5
7	Analysis of Investment Projects	2	108	2,0	3,0
8	Monetary Policy and the National Bank of Ukraine	2	54	1,0	1,5
<b>Master program "Insurance Business"</b>					
4	Management of reinsurance operations	1	72	1,33	2,0
5	Insurance risk management	2	108	2,0	3,0
6	Insurance Marketing	2	108	2,0	3,0
7	Analysis of Investment Projects	2	108	2,0	3,0
8	The methodology and the organization of research in insurance	2	36	0,67	1,0
<b>Master program "Exchange stock market activities"</b>					
4	Stock market regulation	1	108	2,0	3,0
5	The organization of the exchange of financial market	1	108	2,0	3,0
6	Exchange E-commerce	2	72	1,33	2,0
7	Organization Depository Activity	2	72	1,33	2,0
8	Brokerage activity	2	72	1,33	2,0
<i>Total number</i>			720	13,33	20,0
<i>Total chosen by university</i>			864	16,0	24,0
<b>2.2. Disciplines chosen by students</b>					
<i>2.2.1. Cycle of professional and practical training*</i>					
<b>Production oriented disciplines</b>					
<b>Master program "Banking service of agricultural enterprises"</b>					
1	Analysis and management of banking	1	72	1,33	2,0
2	Banking services of agricultural enterprises	2	72	1,33	2,0
3	Marketing in banks	2	72	1,33	2,0
<i>Total selected by the students</i>			216	4,0	6,0
<b>Master program "Corporate Finance"</b>					
1	Corporate Governance	1	108	2,0	3,0
2	Financial management of corporations	2	108	2,0	3,0
<i>Total selected by the students</i>			216	4,0	6,0
<b>Master program "Insurance Business"</b>					
1	Agricultural insurance	1	108	2,0	3,0
2	Financial support of insurance liabilities	2	108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<i>Total selected by the students</i>			216	4,0	6,0
<b>Master program "Exchange stock market activities"</b>					
1	Analysis and forecasting of stock market	1	108	2,0	3,0
2	Technology of futures trading	2	108	2,0	3,0
<i>Total selected by the students</i>			216	4,0	6,0
<b>Research oriented disciplines</b>					
<b>Master program "Scientific Support of the financial mechanism and financial services for agribusiness"</b>					
1	Banking Management	2	108	2,0	3,0
2	The methodology and the organization of financial and economic research	2	108	2,0	3,0
3	Analysis and Forecast of stock market	2	108	2,0	3,0
<i>Total selected by the students</i>			324	6,0	9,0
Total number of elected part			1116	20,67	31,0
Practical training			72	1,33	2,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			2160	40,0	60,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotation of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of professional and practical training\**

**Financial Management.** Modern methods of financial management of business entities. The system of financial management. Management Skills incoming and outgoing cash flows of the company, the assessment of financial risks and the use of instruments of crisis management.

**Management of personnel.** Human Resources Management and the formation of the organization's personnel. Effective HR organization.

**International Management.** Modern foundations and international environment management. Problems of development under conditions of globalization. Methods and tools of international management.

**Strategic Management.** Introduction to strategic management of enterprises. Mission and strategy of the enterprise system. Tools for strategic planning. Methods, implementation and monitoring of strategies.

**Financial services market.** Theoretical Foundations functioning financial market. Services for segments of the financial market. The organizational bases of functioning of the financial services market in Ukraine.

**Management of financial sanitation of company.** Socio-economic nature of bankruptcy and the factors that cause it. Evaluate and determine the prospects of bankruptcy restore the solvency of the debtor. The grounds and procedure for bankruptcy proceedings. Remediation (financial recovery) business. The settlement agreement in the bankruptcy case. The liquidation procedure. Features of the bankruptcy of certain categories of businesses.

#### **2. ELECTIVE ACADEMIC DISCIPLINES**

##### *2.1. Disciplines chosen by University*

##### *2.1.1. Cycle of humanitarian, social and economic training\**

**Business foreign language.** Acquiring knowledge and skills. What is needed to provide students communicative ability in the areas of professional communication.

**Agricultural Policy.** Mastering the theoretical and methodological foundations formulation and implementation of agricultural policy, how to evaluate its effectiveness and justify the choice of various measures of state regulation of economic nature, character and the main components of agricultural policy, certain measures of financial and credit, tax and price policies in the agricultural sector.

*2.1.2. Cycle of professional and practical training\**

**Tax management.** Mastering of the latest knowledge on tax and business skills necessary for future management professionals in the field of taxation. The study of economic, organizational, legal issues that arise in the management of tax administration.

**Mortgage Lending.** Formation of future professionals with specialized knowledge of the work of mortgage financial institutions and principles of the system of mortgage lending in general. The study of the theory and practice of credit is secured by real estate.

**Stock market.** Formation of knowledge on the organization and functioning of exchange trading of different types of stock market, the acquisition of practical skills: organization of trading in commodities, securities, currencies, establishment and operation of brokerage firms, the use of the exchange of information for highly efficient production and marketing of agricultural products.

**Master program “Banking service of agricultural enterprises”,  
Master program “Corporate Finance”**

**International payments and foreign exchange transactions.** Formation of future professionals with specialized knowledge of the organization of credit institutions and principles of operation of foreign exchange markets and the international lending system as a whole. The study of international monetary, credit and payment relations between countries with developed market economies.

**Budget management.** Gaining theoretical and practical knowledge to uncover opportunities, develop skills to organize the budget process in Ukraine and its management, and implementation of the state budget, the discipline is the state budget resources and relationships associated with their use.

**Analysis of investment projects.** Develop in students a comprehensive idea of the value of project analysis for the prospects of business development, the possible alternatives of market approaches and support projects to meet social needs. Study of modern methods of management of investment projects by business entities.

**Monetary Policy and the National Bank of Ukraine.** The formation of future professionals with specialized knowledge of the organization of the central bank of the monetary policy, the ability to use their knowledge in the performance of operations, credit related calculations, the financing of investments and the provision of other services. Study of the National Bank of Ukraine, especially its operation and main directions of monetary policy.

**International finance.** Forming future financiers of knowledge in international finance mechanisms and instruments of decision-making in the monetary, credit and investment relations at the micro and macro levels, practical skills in the international financial sector. The study of the theory and practice of the system of international finance.

**Methodology of financial and economic research of agricultural enterprises.** Mastering the methodology and organization of research and acquiring skills to apply appropriate methods of financial and economic research in solving scientific problems to generate new knowledge and making appropriate decisions based on the information obtained, and the preparation of scientific publications. Methodology as knowledge about the world and knowledge about knowledge, that is, how the effects achieved by understanding the financial and economic sphere.

---

### **Master program “Insurance Business”**

**Management of reinsurance operations.** Sequential formation of students' basic knowledge of the theory and practice of reinsurance. Investigation of economic relations that arise between the subjects of the insurance market in the exercise of reinsurance operations.

**Insurance risk management.** Providing of knowledge about the theoretical foundations and practical application of specific methods of insurance risk management, reinsurance and financial activities of insurance companies. Insurance risk management and direction of its application.

**Insurance Marketing.** Mastering the basic concepts of insurance marketing insurance company, the acquisition of practical skills in the students required for the successful development and promotion of insurance products.

**Analysis of investment projects.** Develop in students a comprehensive idea of the value of project analysis for the prospects of business development, the possible alternatives of market approaches and support projects to meet social needs. Study of modern methods of management of investment projects by business entities.

**The methodology and the organization of research in insurance.** Mastering the methodology and organization of research and acquiring skills to apply appropriate methods of financial and economic research to generate new knowledge in the preparation of scientific publications in taking appropriate practical solutions in the field of insurance based on received information.

### **Master program “Exchange stock market activities”**

**Stock market regulation.** Formation of the students basic knowledge of the operation and regulation of the stock market and its role in the processes of accumulation and movement of capital, study the characteristics and mechanisms of financial services banking and non-banking financial institutions, the activities of economic entities in the securities market and the mechanism of regulation of the stock market.

**The organization of financial exchange market.** Forming students complex system of specialized knowledge and skills in the organization and functioning of the financial exchange market. Theoretical and methodological aspects of economic and financial market exchange.

**Exchange e-commerce.** The acquisition of theoretical and practical knowledge on the basics of exchange activities. Algorithms of exchange e-commerce.

**Organization of depository activities.** Providing knowledge on methodological foundations and practical issues depository of securities market of Ukraine, including keeping registers of securities holders.

The need to study this subject due to the importance of knowledge of the current depository of securities market in Ukraine in order to develop an improved model of the National Depository of Ukraine postdokumentarnoho period on the securities market.

**Brokerage activities.** Closing the theoretical and practical foundations in the organization and efficient functioning brokerage intermediary in the exchange market. Ensuring effective use of acquired skills immediately into practice.

#### *2.2. Disciplines by students choice*

##### *2.2.1. Cycle of professional and practical training\**

#### *Production specialization*

### **Master program “Banking service of agricultural enterprises”**

**Analysis and management of banking.** Mastery of modern techniques for analysis and management of banking. The study of the theory and practice of analysis and management of banking.

---

**Banking services of agricultural enterprises.** Formation of the students basic knowledge of banking of agricultural enterprises, the theory and practice of banking of agricultural enterprises.

**Marketing in banks.** Providing knowledge about research methods and forecasting of the money market and banking market, a comprehensive system of marketing at the bank to sell banking services with a focus on the needs of specific customers and increase profits by analyzing and forecasting financial market.

#### **Master program “Corporate Finance”**

**Corporate management.** Mastering basic knowledge of the theory and practice of management system of elected and appointed bodies that management of publicly traded companies, forming the ability to manage operating and investing activities of joint stock companies have skill make better financial decisions.

**Financial management of corporations.** Help students deeply learn the theory and practice of of corporations finance management, identify features, learn strategy and tactics of financial corporations, development of abilities to quickly find the best financial decisions.

#### **Master program “Insurance Business”**

**Agricultural insurance.** Ability to combine theoretical knowledge with practical skills that develop between business entities to form an effective organizational and economic mechanism of insurance protection enterprises of the agricultural sector, an understanding of the conceptual foundations of agricultural insurance.

**Financial support of insurance liabilities.** Combining theoretical knowledge and practical skills regarding financial support for the insurers obligations under signed agreements with business entities, understanding the conceptual basis of the calculation of insurance rates and the formation of insurance reserves.

#### **Master program “Exchange stock market activities”**

**Analysis and forecasting stock market.** Formation analytical skills by studying Masters of methods and tools for analyzing stock market to predict its future outlook.

**Technology of futures trading.** Formation of modern thinking in of futures trading and specialized knowledge of the organization and execution of transactions in the futures market hedging practice and mastery of speculation, analysis, and forecasting futures market, the use of financial instruments, futures market for the world's leading and domestic electronic exchange platformahsfery agriculture.

#### *Research oriented disciplines*

#### **Master program “Scientific Support of the financial mechanism and financial services to agribusiness”**

**Bank management.** Providing knowledge on the theory and practice of bank management. The study of the nature, purposes and principles of bank management, organizational structure and management system bank methodology of strategic and operational planning in the bank.

**The methodology and the organization of financial and economic research.** Providing knowledge on financial and economic analysis and forecasting of financial relations. The study of the methodology of scientific research and the acquisition of skills in application of the relevant methods of financial and economic research in solving scientific problems to generate new knowledge and adequate practical decision-making based on information received as well as the preparation of scientific publications, theses and master's thesis.

**Analysis and forecasting of stock market conjuncture.** Study the methods of assessment of the situation on the stock markets, prevailing and forecast development for

---

## MASTER DEGREE PROGRAMS

the future. Generate students' knowledge of the phase analysis and prediction prospects functioning of stock market.



**Master Training  
in specialty “TAXATION”  
Branch of knowledge “Economics and Entrepreneurship”**

**Form of training, licensed number of students:**

– full-time	50
<b>Term of study</b>	<b>1 year</b>
<b>Credits</b>	<b>60 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian</b>
<b>Qualification of graduates</b>	<b>master's degree in Taxation</b>

**The concept of training**

Education Masters in “Taxation” guideline for training qualified personnel for the tax authorities, as well as the preparation of corporate finance associations of the agricultural sector to manage tax obligations.

In the process of professional theoretical knowledge students gain knowledge regarding the tax authorities of management functions, advanced methods and tools tax management. During the practical training at the university and the State Tax Inspectorate, masters acquire practical skills in the administration of taxes on businesses and individuals, working with professional computer programs and on mutually beneficial relationship with the taxpayers.

**Production oriented master program**

***Master program “Taxation of agricultural businesses”***

Getting the basic theoretical and practical knowledge of: taxation of business entities, tax planning and forecasting, tax optimization, its methods and techniques in the management of agricultural activities of business entities, corporate tax management to reduce the negative impact of taxation on their economic operations and financial condition; acquiring professional skills in the administration of taxes on businesses and individuals to prepare qualified for the tax authorities and corporate associations of enterprises and agricultural processing sectors.

**Sphere of graduates employment**

Head of financial or economic unit, the head of a small business in agriculture, manager of finance, Inspector Tax Service, Inspector of Customs, state tax auditor, inspector, consultant taxes and fees.

**Research oriented master program**

***Master program “Theoretical and methodological bases of taxation and tax regulation”***

Getting fundamental theoretical knowledge and practical skills in the formation mechanisms of the business entity tax, tax planning and forecasting, implementing analytical work to identify specific factors affecting the operation of the tax system, a comprehensive assessment of the impact of the tax system, detection efficiency provisions of the tax; quantitative and qualitative characteristics of the processes taking place in the country and some areas; fiscal management as part of the national tax management, and of practical action plan budget revenues of the state, regions and tax reasons.

---

### Sphere of graduates employment

Head of financial or economic unit, the head of a small business in agriculture, manager of finance, taxes and consultant fees, managers, assistants responsible executors of tax units of provincial tax departments STA district DPI, professionals in the civil service, researcher.

### Practical training

Practical training is based on the following companies and organizations: Ministry of Finance of Ukraine, the Ministry of Agrarian Policy of Ukraine, the State Tax Inspection, leading companies, associations, firms, research institutes, etc. Ukraine.

### Proposed Topics for Master Theses

1. Excise tax in the tax system of Ukraine.
2. Impact of tax policy on economic and social development in Ukraine.
3. Impact of taxation on investment.
4. The value of special payments for use of natural resources in the tax system of Ukraine.
5. The mechanism of tax regulation of the economy of Ukraine.
6. Indirect taxes and its impact on social welfare.
7. Taxation of individuals – entrepreneurs.
8. Taxation of companies and their influence on the financial and economic decisions.
9. Assessing the impact of tax systems on the environment.

### Academic rights of applicants for a master program

In addition to the specialty “Assessment” applicants with a bachelor of arts in the direction of the “Finance” may continue studying the **field of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

### Curriculum for specialist training of the educational and qualification level “Master” in specialty “Taxation”

№	Discipline, practice	Semester	Amount		
			Hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of professional and practical training*</i>					
1	Tax control	1	144	2,7	4,0
2	Organization of civil servants	1	144	2,7	4,0
3	Customs	1	144	2,7	4,0
4	Tax administration	2	144	2,7	4,0
5	Budget Management	2	144	2,7	4,0
6	Tax Accounting	2	144	2,7	4,0
<i>Total number</i>			864	16,0	24,0
Total according to regulatory part			864	16,0	24,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional and practical training*</i>					



**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Amount		
			Hours	Credits	
				national	ECTS
1	Financial Management	1	108	2,0	3,0
2	Department of regional development	1	72	1,3	2,0
3	Business Foreign Language	1	72	1,3	2,0
4	Personnel Management	2	108	2,0	3,0
5	Organization of the tax authorities in GTS	2	108	2,0	3,0
6	Taxation of Individuals	2	108	2,0	3,0
7	Tax Planning	2	72	1,3	2,0
8	Agricultural policy	2	72	1,3	2,0
<i>Total number</i>			720	13,3	20,0
<i>Total selected by the students</i>			720	13,3	20,0
2.2. Disciplines chosen by the students					
2.2.1. Cycle of professional and practical training*					
Production oriented disciplines					
Master program "Taxation of agricultural businesses"					
1	Tax Policy	1	144	2,7	4,0
2	Taxman ARM	2	144	2,7	4,0
<i>Total selected by the students</i>			288	5,3	8,0
Research oriented disciplines					
Master program "Theoretical and methodological bases of taxation and tax regulation"					
1	Tax Policy	1	144	2,7	4,0
2	Corporate Tax Management	2	144	2,7	4,0
<i>Total selected by the students</i>			288	5,3	8,0
Total number of elected part			1008	18,7	28,0
Practical training			72	1,3	2,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			2160	40,0	60,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### Annotation of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### 1.1. Cycle of professional and practical training \*

**Tax control.** Tax control in the system of state regulation of the economy. Tax audit.

**Organization of the civil servants.** Develop students' system of knowledge and skills required for effective performance of duties by civil servants.

**Customs.** Introduction to the customs. The order of movement of goods across the customs border of Ukraine. Customs control and responsibility for violation of customs regulations.

**Tax administration.** Legal basis of tax administration. Organization of the DPS. Administration of taxes and fees.

**Budget management.** Mastering knowledge of the mechanism of drawing up, approval and implementation of the budget. Formation of knowledge on public credit and debt management. Learning assembly process of budget reporting, monitoring the implementation of the budget.

**Tax Accounting.** Tax records, its content and organization of the enterprise. Tax accounting and tax payments.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professional and practical training\*

**Financial management.** The theoretical and organizational foundations of financial management. The system of financial management. Evaluation of the financial situation of the company (analysis of financial statements). Financial forecasting and planning. Cash Management in the enterprise. Definition of time value of money and its use in financial calculations. Office of profit. Working Capital Management. Costs and capital structure. Investment management of the enterprise. Income and risk.

**Management of regional development.** General characteristics of the agricultural production in the regions of Ukraine. Analysis of the markets and agri-food products development strategy of the region. Ensuring food security in the region and the development of agricultural regions.

**Business foreign language.** Learning a foreign language for possession specialty. Professional lexical and grammatical least. Written business communication, report writing, reports. Linguistic and communicative features of oral presentations.

**Management of personnel.** Human Resources Management System and the formation of the organization's personnel. Efficient management of organization's resources.

**Organization of the tax authorities in DPS.** The State Tax Service – element of a structure of government. Organization management system by the tax authorities. The organization of the management of the state tax service. Providing management by the tax authorities. The organization of administrative work in the state tax service. Organizational and managerial problems of the tax administration. Work with taxpayers and public relations in the state tax service of Ukraine.

**Taxation of individuals.** Taxation of personal income tax system in Ukraine. The tax on personal income. The traditional system of taxation of private enterprises. Simplified tax system. Taxation of personal income in developed countries.

**Tax planning.** Tax planning at the macro and micro level: the nature, scope, role. Tax forecasting and planning – part of the national tax management. Budgeting and tax planning in the company. The organization and methods of tax planning at the micro level. Strategic and ongoing tax planning. Tax burden entity. Evaluating the effectiveness of tax planning. International corporate tax planning.

**Agricultural Policy.** The essence and historical aspects of agricultural policy. Economic policy for the agricultural sector. Formation of market of food, raw materials. Food security. Land Reform. Personnel policy.

### 2.2. Disciplines chosen by student

#### 2.2.1. Cycle of professional and practical training \*

##### *Production oriented disciplines*

#### **Master program “Taxation of agricultural businesses”**

**Tax policy.** The theoretical basis of the tax policy. The forms and mechanisms of fiscal policy.

**AW of taxman.** The concept of databases. Database “FoxRro”. Basics AIS “Taxes”. The initial organization databases. Keeping cards personal accounts. Interest and tax payments. Accounting for payment documents. Formation reports. System functions. The concept of the program “Tax Statements”. Formation tax reporting software tools “Tax Statements”.

---

*Research oriented disciplines*

**Master program “Theoretical and methodological bases of taxation and tax regulation”**

**Tax policy.** The theoretical basis of the tax policy. The forms and mechanisms of fiscal policy.

**Corporate tax management.** Corporate tax management in enterprise management system. Tax evasion as a way to minimize tax payments. Tax optimization companies in corporate tax management. Analysis and its place in the corporate tax management. Corporate tax planning. Control and its place in the corporate tax management. International corporate tax planning.

---

**Master Training  
in specialty “ACCOUNTING AND AUDITING”  
Branch of knowledge “Economics and Entrepreneurship”**

<b>Form of training, licensed number of students:</b>	
– full-time	<b>150</b>
– correspondence	<b>150</b>
<b>Term of study</b>	<b>1 year</b>
<b>Credits</b>	<b>60 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian, English</b>
<b>Qualification of graduates</b>	<b>master's degree in Accounting and Auditing</b>

**The concept of training**

Modern development of a market economy requires experts in accounting and auditing thoroughness professional skills to global standards, creative thinking and intellectual capacity for a wide selection of specific areas of practical work. This is necessary to improve the modern system of training in accounting and auditing is an urgent need for restructuring curricula, targeting them for deeper meaning and improve the quality of vocational education in the study of teaching methods inovatyky majors for training specialists.

Master's stage of training in accounting and auditing differ qualitatively new curricula and programs, innovative forms of school organization that focused on providing a high level of theoretical knowledge, directly involved in the research and testing of results in practice, mastery of scientific and methodological foundations educational activities.

Master of Accounting and Auditing should be skilled with the general level of education and culture to the international standards, which has sufficient intellectual capacity to a wide selection of specific areas of practice, to be able to use modern techniques to investigate the object, highlight elements of the system determine their essential parameters and characteristics, to form a model of the system, make it rational managerial influence, make suggestions for improving the activity.

The defining features of the master must be a research approach to the analysis of the research subject, the ability to quantitatively and qualitatively assess the impact of object classification approach to economic evaluation of decisions and control the results.

Master of Accounting and Auditing must possess not only new methods of work, but also new ideas about the system of governance in which they should be applied.

Masters specialty “Accounting and Auditing” aimed at training level that can effectively analyze production and financial activities of entities of different patterns of ownership, measure the inner potential of the company from the perspective of increasing the efficiency of its production and sales activities, and compliance capabilities and threats to the environment, to explore the domestic and foreign markets, to determine an estimate of its situation by providing a rational strategic development of the company.

**Production oriented master program**

***Master Program “Methods and organization of accounting, control and analysis in the management of banks”***

Provides study the characteristics and methods of accounting, analysis and audit of banks' objects: transactions in securities, bills of exchange operations, non-cash transactions, leasing transactions, interbank payments, income and expenses of banks,

the formation and use of reserve funds of banks, deposit operations banks, foreign exchange transactions, investment banking activities, analysis of financial condition of the bankrupt, credit market conditions.

**Sphere of graduates employment**

Chief Accountant, Deputy Chief Accountant, Accountant (with specialist diploma) banks.

***Master Program “Methods and organization of accounting, control and analysis in the management of enterprises of agricultural production”***

Provides trends and patterns of accounting development in Ukraine in reforming its the principles of international standards and requirements of the Institute of European integration, methodology and organization of accounting for objects: non-current and current assets, equity, long-term and current biological assets, long-term and current liabilities, payments to the tax system costs and revenues by activity, financial reporting, management accounting and cost calculation of production costs in crop, livestock, auxiliary industries, monitoring, audit and analysis of objects of assets, liabilities and processes activities using computer technology.

**Sphere of graduates employment**

Chief Accountant, Deputy Chief Accountant, Senior Accountant, Accountant I category II category Accountant, Accountant (with specialist diploma) agricultural company.

***Master program “Economic control of businesses of agricultural production”***

Involves the study of economic control and direction of its reform, the organization of economic control with the use of computer technology, the method of its implementation, organization and methods of control objects: non-current assets, inventories, cash and payments, equity, long-term and current liabilities' Liabilities, costs and revenue, results, organization and methods of internal control, including inventory, documenting the results of audits and inspections, implementation of audit and inspection of materials and procedure in respect of pecuniary damage.

**Sphere of graduates employment**

Auditor, assistant auditor, senior auditor, auditor and categories, auditor of the second category, auditor agricultural company

***Master Program “Methods and organization of accounting, control and analysis in the management of budgetary organizations”***

Involves the study of accounting policies budgetary organizations of accounting and control of revenues, expenditures and cash general and special funds of budgetary organizations, especially the reporting of budgetary organizations, especially the accounting and control of property, stocks, funds and accounts, the use of computer technology in accounting and control budgetary organizations.

**Sphere of graduates employment**

Chief Accountant, Deputy Chief Accountant, Accountant (with specialist diploma) budgetary institutions

---

## Research oriented master program

### ***Master program “Accounting, control and analysis in the management of agricultural enterprises”***

Provides research methodology of accounting, monitoring and analysis for accounting and analytical and information management activities, expenses, income, capital and financial capital investment, biological assets, business processes, human resources and organization and methods of control and audit work audit, internal control and forensic accounting of agricultural enterprises; adaptation of international standards in accounting and auditing practices in the nation, computer technology in accounting, auditing and analysis.

### **Sphere of graduates employment**

Research Associate (Accounting), researcher (audit), Research Fellow (Information Analyst) Accountant Analyst.

### **Practical training**

Practical training is based on the following companies: VP NUBiP Ukraine “Velykosnitynske educational and experimental farm them. O. Muzychenko”, EP NUBiP Ukraine “Agronomic Research Station”, EP NUBiP Ukraine “Teaching and Research Farm “Vorzel”, EP NUBiP Ukraine “Boyar Forest Experiment Station”, South Branch NUBiP Ukraine “Crimean Agricultural University”, EP NUBiP Ukraine Nemishaivo Agricultural College, State Enterprise education Research tribal “Poultry plant Frunze”, LLC Agro-industrial company “Dream”, PJSC CB “Privat”, other bases of practical training university students from among the leading institutions, enterprises, organizations of any ownership in Ukraine and abroad, with adequate facilities for student practice in accordance with the requirements of the educational and vocational training programs.

### **Proposed Topics for Master Theses**

1. Accounting and analytical support for management of fixed assets.
2. Accounting and analytical support of current biological assets.
3. Accounting and analytical software cost management of agricultural enterprises.
4. Accounting, control and cost analysis for crop production.
5. Accounting and internal business control of the finished product.
6. The balance sheet of the bank, its method of preparation and analysis.
7. Reporting budgetary institutions: organization and methods of assembly.
8. Accounting and internal business control equity.
9. Method of accounting and control of development and use of revenue.
10. Accounting and internal business control efficiency of bank loans.

### **Academic rights of applicants for a master program**

In addition to the specialty “Accounting and Auditing” Applicants with a bachelor of arts with a specialty “Accounting and audit” can continue studying ***the field of knowledge 1801 “Specific categories”***:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
  - 8.18010021 – “Pedagogy of Higher School”(see p. 434);
  - 8.18010018 – Administrative management (see p. 397);
  - 8.18010020 – “Educational Institution Management” (see p. 427)
-

MASTER DEGREE PROGRAMS

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “Accounting and Auditing”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of professional and practical training*</i>					
1	Financial Management	1	108	2,0	3,0
2	Personnel Management	1	108	2,0	3,0
3	International Management	1	108	2,0	3,0
4	Strategic Analysis	2	108	2,0	3,0
5	Reporting Enterprise	2	162	3,0	4,5
6	Organization Accounting	2	162	3,0	4,5
<i>Total number</i>			756	14,0	21,0
Total according to regulatory part			756	14,0	21,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	72	1,3	2,0
2	Agricultural Policy	1	108	2,0	3,0
3	Management of regional development	2	72	1,3	2,0
<i>Total number</i>			252	4,7	7,0
<i>2.1.2. Cycle of professional and practical training*</i>					
1	Accounting Forensic examination	1	108	2,0	3,0
2	Financial Analysis	1	72	1,3	2,0
3	Tax Management	1	72	1,3	2,0
4	Features and accounting to international standards	1	72	1,3	2,0
5	Accounting for Foreign Trade	2	108	2,0	3,0
6	Models and methods of decision-making analysis and audit	2	72	1,3	2,0
<i>Total number</i>			504	9,3	14,0
<i>Total chosen by university</i>			756	14,0	21,0
<b>2.2. Disciplines chosen by the students</b>					
<i>2.2.1 Cycle of professional and practical training*</i>					
Production oriented disciplines					
Master Program “Methods and organization of accounting, control and analysis in the management of banks”					
1	Banking operations	1	72	1,3	2,0
2	Accounting in Banks	1	72	1,3	2,0
3	Internal control in banks	2	72	1,3	2,0
4	Audit in banks	2	72	1,3	2,0
5	Analysis of Banking	2	72	1,3	2,0
Master Program “Methods and organization of accounting, control and analysis in the management of enterprises of agricultural production”					
1	Accounting in industrial enterprises and ahroservisnyh	1	72	1,3	2,0
2	Stock market	1	72	1,3	2,0
3	Internal control in agricultural plants	2	72	1,3	2,0
4	Accounting for small businesses in agriculture	2	144	2,7	4,0
Master program “Economic control of businesses of agricultural production”					
1	Stock Market	1	72	1,3	2,0
2	Organization and methods of forensic accounting	1	72	1,3	2,0
3	Internal control in agricultural plants	2	72	1,3	2,0
4	Economic Control	2	144	2,7	4,0
Master Program “Methods and organization of accounting, control and analysis in the management of budgetary organizations”					
1	Banking operations	1	72	1,3	2,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
2	Accounting for budget organizations and institutions	1,2	144	2,7	4,0
3	Internal control in budget institutions	2	72	1,3	2,0
4	Analysis of estimates of budgetary organizations and institutions	2	72	1,3	2,0
<i>Total selected by the students</i>			360	6,7	10,0
Research oriented disciplines					
Master program "Accounting, control and analysis in the management of agricultural enterprises"					
1	Stock Market	1	72	1,3	2,0
2	Methodology and Organization of Research	1	72	1,3	2,0
3	Internal control in agricultural plants	2	72	1,3	2,0
4	Accounting in Business Management	2	72	1,3	2,0
5	Accounting, analysis and control transaction costs	2	72	1,3	2,0
<i>Total selected by the students</i>			360	6,7	10,0
Total number of elected part			1116	20,7	31,0
Practical training			72	1,3	2,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			2160	40,0	60,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of professional and practical training\**

**Financial Management.** The theoretical and organizational foundations of financial management. The system of financial management. Evaluation of the financial situation of the company (analysis of financial statements). Financial forecasting and planning. Cash Management in the enterprise. Definition of time value of money and its use in financial calculations. Office of profit. Working Capital Management. Costs and capital structure. Investment management of the enterprise. Income and risk.

**Management of personnel.** Human Resources Management System and the formation of the organization's personnel. Efficient management of organization's resources.

**International Management.** The essence and characteristics of international management. Environment International Management. General functions of the International Management: Decision making in international corporations. Information support of international management. Organizational development of international corporations. Strategic planning in international corporations. Guide to international corporations. Organizational structure of multinational corporations. Technological policies of multinational corporations. Control and accountability in international corporations. Investment transactions of multinational corporations. Financial management in international business.

**Strategic analysis.** The study of the nature, direction and role of strategic analysis in the enterprise, the enterprise analysis techniques, methods of analysis of the production program, capital structure, financial programs and investments. Acquiring the skills of analysis and evaluation of the potential of the enterprise as a factor of development strategies.

**Reporting enterprise.** General reporting requirements. Balance sheet. Income Statement. Statement of Cash Flows. Statement of changes in equity. Correction of errors and changes in the financial statements. Overall and consolidated reporting. The financial report of the small businesses. Tax reporting. Statistical and special reports.



**Organization of accounting.** Fundamentals of accounting, control and analysis. Subject instructional techniques of accounting and control. Organization of accounting, control, and analytical processes. Organizational structure and organization of the accounting staff accounting and control. Features of accounting in certain areas. Organization of information and technical support for accounting and control. Organization of accounting and control.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of humanitarian, social and economic training\*

**Business foreign language.** Learning a foreign language for possession specialty. Professional lexical and grammatical least. Written business communication, report writing, reports. Linguistic and communicative features of oral presentations.

**Agricultural Policy.** The essence and historical aspects of agricultural policy. Economic policy for the agricultural sector. Formation of market of food, raw materials. Food security. Land Reform. Personnel policy.

**Management of regional development.** General characteristics of the agricultural production in the regions of Ukraine. Analysis of the markets and agri-food products development strategy of the region. Ensuring food security in the region and the development of agriculture in the region.

#### 2.1.2. Cycle of professional and practical training\*

**Forensic accounting.** Summary of SBUs, research methods, the output UPS, methods of operations research funds, property, wages and salaries, production and sale of agricultural products, as well as payment for taxes.

**Financial Analysis.** The theoretical basis of financial analysis. Key indicators of financial analysis. Analysis of current assets, property and capital. Analysis of profitability

**Tax management.** Theoretical and organizational principles of tax management. Accounting jobs at the DPS. Testing and verifying the work of the DPS.

**Features and accounting according to international standards.** Conceptual Foundations of International Financial Reporting Standards (IFRS). The main provisions of IFRS. Sectoral features of accounting under IFRS and special accounting rules for certain business transactions.

**Accounting for foreign trade.** Subject, objectives and content of the discipline. External Contracts and features display information in the accounting system. Accounting transactions from exports. Accounting for importing operations. Accounting for barter and tolling. Accounting for investment transactions. Accounting for monetary transactions. Accounting transactions in enterprises with foreign investment.

**Models and methods of decision-making analysis and audit.** The bottom line, principles and methodological foundations of the methods and models to develop management solutions. Methods of development of possible solutions breakeven enterprise. Methods and models of development management solutions real and financial investments and asset management. Methods and models of strategic management and forecasting of development.

### 2.2. Disciplines chosen by the students

#### 2.2.1. Cycle of professional and practical training\*

##### *Production oriented disciplines*

**Master Program “Methods and organization of accounting, control and analysis in the management of banks”**

---

**Banking operations.** Classification of banks by ownership. The main types of modern banks. Internal operations and their characteristics. Activities of commercial banks to service businesses and individuals.

**Accounting in banks.** Features build accounting in banks. Correspondent relations between banks and the opening and operation of accounts in local and foreign currency. Accounting for transactions carried out by banks.

**Internal control in banks.** The organization and methods of intra-control monitoring of cash transactions and foreign exchange transactions. Organization of intra-monitoring internal banking operations and control operations with securities. Verification of deposit and credit transactions with banks and control of accounting and reporting.

**An audit in banks.** General questions bank audit. Organization and methodology of the audit of banking operations. The final phase of the audit.

**Analysis of banking.** Theoretical basis of analysis of banking. Procedures for the analysis of banking. Evaluation of the financial condition of the commercial bank.

**Master Program “Methods and organization of accounting, control and analysis in the management of enterprises of agricultural production”**

**Accounting and ahroservisnyh in industrial enterprises.** Expenditure ancillary industries. Expenditure on maintenance of agricultural machinery. Accounting for costs and yields of industrial production. Expenditure and services provided catering. Accounting in trade.

**Stock market.** Organizational support derivatives trading. Insurance price and exchange rate risk in the stock market. Features of the stock and currency exchanges.

**Internal control in agricultural enterprises.** Control of financial activities, monitoring equity and liabilities, control of revenues, expenditures and financial results.

**Accounting for small businesses in agriculture.** Forms of Small Business and objectives and organization of accounting for them. Accounting for the private entrepreneur. Chart of accounts and records in the form of small businesses. Accounting for funds and accounts. Accounting for inventory and fixed assets. Accounting for manufacturing, sales and financial results. Preparation and submission of financial and tax reporting.

**Master program “Economic control of businesses of agricultural production”**

**Stock market.** Organizational support derivatives trading. Insurance price and exchange rate risk in the stock market. Features of the stock and currency exchanges.

**The organization and methods of forensic accounting.** Theoretical aspects of forensic accounting. Directions and practical mechanism of forensic accounting.

**Internal control in agricultural enterprises.** Control of financial activities, monitoring equity and liabilities, control of revenues, expenditures and financial results.

**Economic control.** Fundamentals of economic control, control of settlement and credit operations, monitoring revenues and financial results

**Master Program “Methods and organization of accounting, control and analysis in the management of budgetary organizations”**

**Banking operations.** Classification of banks by ownership. The main types of modern banks. Internal operations and their characteristics. Activities of commercial banks to service businesses and individuals.

**Accounting for the budget organizations and institutions.** Organization of accounting in public institutions. Organizational and methodical preparation of records of cash budget institutions functioning treasury system. Accounting for finance income funds and the general fund. The payments and commitments. Accounting for fixed assets. Accounting for inventories. The payments of wages and insurance. Revenue and

---

expenditures of special funds. Accounting for manufacturing costs. Reporting in budget institutions.

**Internal control in budget institutions.** Organization of internal control in budget institutions. Internal control performance of budgetary institutions.

**The analysis estimates the budget organizations and institutions.** Functional analysis of budgetary organizations and institutions. Analysis of the expenditure budget agency.

*Research oriented disciplines*

**Master program “Accounting, control and analysis in the management of agricultural enterprises”**

**Stock market.** Organizational support derivatives trading. Insurance price and exchange rate risk in the stock market. Features of the stock and currency exchanges.

**Methodology and organization of scientific research.** Science and scientific research. Accounting as a science. Results of research: testing, implementation and evaluation. Preparation of speeches on the results of scientific research. Scientist and supervisor.

**Internal control in agricultural enterprises.** Control of financial activities, monitoring equity and liabilities, control of revenues, expenditures and financial results.

**Accounting in Business Management.** Essentials of methodology and organizational structure of accounting in business management. Accounting internal business registration of industrial activity by the method of complete and incomplete inputs in production costs

**Accounting, analysis and control of transaction costs.** Background of transaction costs and the impact of economics on their development. Concept and types of transaction costs. Accounting and analytical support for management of transaction costs. Features accounting transaction costs.

---

**Master Training  
in specialty “MARKETING”  
Branch of knowledge “Economics and Entrepreneurship”**

**Form of training, licensed number of students:**

– full-time	60
– correspondence	60
<b>Term of study</b>	<b>1 year</b>
<b>Credits</b>	<b>60 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian</b>
<b>Qualification of graduates</b>	<b>master's degree in marketing</b>

**The concept of training**

Education by the specialty is aimed at training of specialists marketers who can work in the areas of marketing, advertising, logistics, market research and forecasting, international marketing and trade. As a result of receiving of specialty, masters can make the formation of a market strategy for the company, ensuring the competitiveness of enterprises, development of prospective, current and operational plans of the company, the organization of transport services of foreign economic activity, organization of work of transport systems such as “just in time”, “door to door” and others, the organization of work of the company in an unstable environment, prevention of adverse factors and prevention of crisis, assessment of risk factors in the implementation of marketing activities, measure their size and organize them.

**Production oriented master program**

***Master program “Logistics”***

The program aims to train professionals in the field of marketing logistics who can competently, efficiently and responsibly perform basic logistics functions to facilitate the effective promotion of goods from producer to consumer, introduce new organizational and economic technologies in the field of marketing. The program provides training of highly qualified management staff, capable to creative professional activity and use of innovative methods in the field of logistics.

**Sphere of graduates employment**

Logistics companies and logistics departments of large enterprises.

***Master program “Advertising Management”***

Program of training of management professionals in promotional projects, the organization and management of quality of promotional projects and its implementation. Its goal – is to acquaint students with modern communications technology, management practices of advertising projects, standards and technology development and implementation of promotional activities.

**Sphere of graduates employment**

Agencies and advertising departments of companies and organizations.

***Master program “Commercial and mediation activities”***

The program aims to train professionals in the field of marketing and mediation with a high level of professionalism and a culture that can competently, efficiently and responsibly perform the basic functions of business, with all the existing marketing tools

promote goods from producer to consumer, introduce new organizational and economic technologies in the field of marketing of products.

**Sphere of graduates employment**

Enterprises and organizations engaged in mediation activity.

***Master program "International trade"***

Program of training the specialists for the analysis of foreign markets in a globalizing world economy, development and evaluation of the economic efficiency of international commercial transactions, the application of marketing principles in international trade. The program aims to train professionals in the field of international trade, which can perform the respective functions of trade in foreign markets, promote the effective promotion of products, introduce new technology and economic organization in international trade.

**Sphere of graduates employment**

Marketing departments of international companies and joint ventures.

**Research oriented master program**

***Master Program "Scientific and Methodological Foundations of Marketing and International Trade"***

The program of training specialists, capable on the base of on new methodological approaches to carry out marketing activities, develop strategic plans and recommendations for the creation and implementation of marketing programs, improve the competitiveness of market actors in the growing influence of international competition.

**Sphere of graduates employment**

Postgraduate analytical units of international companies.

**Practical training**

The future masters of marketing on example of real companies explore specific features of agricultural production, which will largely determine the behavior of such products on the market. As potential managers, they learn to manage the departments of marketing, acquire knowledge of the practical aspects of the market and understanding their impact on the development of both the company and the market in general, to determine the place of professional marketer in the administrative and economic system of the state.

**Proposed Topics for Master Theses**

1. Development of strategies for promoting products to foreign markets.
  2. Marketing research of Ukrainian grain market.
  3. Development of marketing strategy of Product.
  4. Development of communication policy on the domestic market.
  5. Improvement of activity of agricultural enterprise on the base of the market research.
  6. Organization of marketing in business.
  7. Organization of commercial activity of enterprise on the base of marketing.
  8. Communication policy on foreign markets.
  9. Management of transport transportation in modern logistics.
  10. Justification of marketing distribution.
-

**MASTER DEGREE PROGRAMS**

**Academic rights of applicants for a master program**

Besides the specialty “Marketing” applicants with a bachelor diploma with a specialty “Marketing” can continue studying the **field of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “Marketing”**

№	Discipline, practice	Semester	Number		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of professional and practical training*</i>					
1	Strategic Marketing	1	108	2,0	3,0
2	Management of staff	1	108	2,0	3,0
3	International Management	2	108	2,0	3,0
4	Marketing Management	1	180	3,3	5,0
5	Product innovation policy	2	108	2,0	3,0
6	Advertising management	2	108	2,0	3,0
<i>Total number</i>			720	13,3	20,0
Total according to regulatory part			720	13,3	20,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by university</i>					
<i>2.1.1. Cycle of professional and practical training*</i>					
1	Stock market	2	108	2,0	3,0
2	Marketing distribution policy	2	108	2,0	3,0
3	Forecasting methods in marketing research	1	108	2,0	3,0
4	Agricultural Policy	1	108	2,0	3,0
5	Commercial activities of intermediary companies	1	108	2,0	3,0
6	Business foreign language	1	108	2,0	3,0
7	Marketing Planning	1	108	2,0	3,0
8	Management competitiveness of enterprise	1	108	2,0	3,0
<i>Total chosen by university</i>			864	16,0	24,0
<i>2.2. Disciplines chosen by the students</i>					
<i>2.2.1. Cycle of professional and practical training*</i>					
Production oriented disciplines					
Master program "Logistics"					
1	Projects Management	2	108	2,0	3,0
2	Mathematical Models in Logistics	2	108	2,0	3,0
3	Logistics in foreign economy activity	2	108	2,0	3,0
4	Transport logistics	2	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
Master program “International trade”					
1	Marketing research of foreign markets	2	108	2,0	3,0
2	International trade and global markets conjuncture	2	108	2,0	3,0
3	Logistica in foreign economic activity	2	108	2,0	3,0
4	International commercial agreements	2	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
Master program “Commercial intermediary activity”					
1	Electronic commerce	2	108	2,0	3,0
2	Merchandising	2	108	2,0	3,0

## MASTER DEGREE PROGRAMS

№	Discipline, practice	Semester	Number		
			hours	credits	
				national	ECTS
3	The technology of direct sales	2	108	2,0	3,0
4	Technology retail trade	2	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
Master program "Advertising management"					
1	Management of advertising projects	2	108	2,0	3,0
2	Brand Management	2	108	2,0	3,0
3	Creativity in Advertising	2	108	2,0	3,0
4	Psychology of Advertising	2	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
Research oriented disciplines					
Master program "Research and Methodological Foundations of Marketing and International Trade"					
1	Methodology and organization scientific research	2	216	4,0	6,0
2	Mathematical Models in Management and Marketing	2	108	2,0	3,0
3	Innovative marketing	2	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
Total number of elected part			1296	24,0	36,0
Practical training			144	2,7	4,0
Writing and defense of master's thesis			144	2,7	4,0
Total for specialty			2160	40,0	60,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### Annotation of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### 1.1. Cycle of professional and practical training

**Strategic Marketing.** The main purpose of teaching is to master modern theoretical basis of strategic marketing and practical skills for making strategic decisions in the management of marketing activities and the development of the enterprise market. The main tasks that be resolved in the process of teaching is theoretical training of students and forming their skills in strategic marketing management.

**Management of personnel.** The goal of teaching is to develop complex theoretical knowledge and practical skills in developing and implementing personnel policies in modern organizations, rational selection of employees for positions and the formation of an effective the labor collective, evaluation and development of workers and purposeful use of their potential.

**International management.** The study of the discipline concerned with the need to give students knowledge about management trends observed in the world. Students studying management systems in different countries, compare them and assess the position of transport in Ukraine.

**Marketing management.** The purpose of discipline is to increase the efficiency of management organizational structures thanks to the proper use of managers at different levels and principles of marketing tools, creating an integrated system of marketing management organization.

**Product innovation policy.** The main purpose of teaching is to master the basics of modern theoretical and practical skills of innovation activity of organization management. The main tasks that be resolved in the process of teaching is theoretical training of students and forming their skills in the field of innovation activity of organization management.

**Advertising management.** The purpose of discipline is to teach students to perceive the production and sale of advertising as a normal product or service that however has its own specific features. Upcoming marketers are exploring approaches to birth advertising, its movement in the market and evaluation.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional and practical training\**

**Stock market.** This subject gives students an idea of the basic tools of the trade used in the global stock market. Future marketing professionals on the example of stock market learning process of birth of the goods and explore the factors that affect it.

**Marketing distribution policy.** The purpose of discipline is to teach students the basics of efficient allocation of goods and services. A feature of this procedure is that this division creates the need to use marketing principles, while at the same time is a result of marketing policies of enterprises and organizations.

**Forecasting methods in marketing research.** The main purpose of the discipline is to develop knowledge of methodology, theory method and process, prediction in research that is conducted on the basis of marketing. The curriculum also provides building a culture and skills of research, implementation of the results in practice of the organization.

**Agricultural policy.** This subject introduces future professionals with the basics of policy-making in agriculture. Studied both domestic and foreign experience. As a result of learning of the material students have the opportunity in a professional manner to form an opinion about the processes and phenomena occurring in the agricultural sector of the state.

**Commercial activities of intermediary companies.** Discipline gives an idea about nature of intermediary companies, reveals their essence and principles of creation. Since most of them aim a profit, then in the process of learning the material, students explore the commercial basis of this phenomenon and try to make these activities more efficient.

**Business foreign language.** The overall objective of the program of foreign language teaching of professional direction is to develop students' professional language competences that will contribute to their effective functioning of the cultural diversity of educational and professional environment.

**Marketing planning.** The purpose of discipline is to justify the need for planning marketing activities and to train future professionals in marketing fundamentals of such planning. As a result, students gain knowledge in using a number of methods and techniques for performance planning taking into account the characteristics of its scope.

**Managing competitiveness of enterprise.** Discipline is intended to teach students to evaluate the competitiveness of enterprises, to identify the factors shaping it. As a result of its study future specialists are able to not only determine the competitiveness of an enterprise, but also have the knowledge to develop a system of measures for its improvement.

### 2.2. *Disciplines chosen by the students*

#### 2.2.1. *Cycle of professional and practical training\**

##### *Production oriented disciplines*

##### **Master program “Logistics”**

**Projects Management.** Provides a knowledge receiving of planning, organizing and managing resources for the successful completion of the objectives and tasks of the project. The main objective is the acquisition of skills to achieve all the goals and objectives of the project, while fulfilling obligations to the predefined constraints of the

---



project. Typical constraints are scope and content of the project, the time, budget. Minor task but more ambitious is optimization, distribution and integration tasks necessary to achieve predetermined goals.

**Mathematical models in logistics.** The purpose of learning a discipline is to develop students' mathematical knowledge to solve problems in professional activities, analytical thinking skills and mathematical formulation of economic problems arising from the management.

**Logistics in foreign economic activity.** The main purpose teaching the discipline is to form future professionals of system knowledge and understanding of the conceptual foundations of logistics in foreign trade, the theory and practice of this trend and skills of independent work on learning about modern management techniques and other material flows in the modern world.

**Transport logistics.** It is assumed that issues such as global characteristics of the transportation and logistics services, transport and logistics strategy of the European Union, the problems of transport logistics, the choice of vehicle, drawing up routes, transport tariffs and fines transport characteristics of goods, scheduling transportation. The purpose of discipline is to get students' knowledge and skills regarding the components of modern transport logistics systems. Task of discipline aimed at the formation students' competence in relation to the development of transport logistics in Ukraine.

#### **Master program “International trade”**

**Marketing research of foreign markets.** The purpose of discipline is to get students' systematic knowledge of objective laws, conditions, processes, and specific characteristics of foreign trade and the acquisition of skills for their practical use. The result of the discipline is to develop in students a holistic understanding of the processes in the field of foreign economical activity and the formation of students' abilities and practical skills in the use of acquired knowledge about application data base for the analysis of the global economic environment in order to choose a strategy for entering foreign markets.

**International trade and world market conjuncture.** The purpose of teaching the discipline is to build in the future marketing specialists of special knowledge of the problems and prospects of international economic relations for basic and special education and practice in the specialty. The result of the discipline is to develop a holistic understanding of the processes that characterize the international level of interaction of national economies and the formation of students' skills on how to use the acquired knowledge for independent analysis of global economic processes.

**Logistics in foreign economic activity.** Main purpose of teaching the discipline is to form in future professionals of system knowledge and understanding of the conceptual foundations of logistics in foreign trade, the theory and practice of this trend and skills of independent work on learning about modern management techniques and other material flows in the modern world.

**International commercial agreements.** The essence of the discipline is to determine the most favorable types of commercial agreements on exit agricultural enterprises on foreign markets. The task of the subject consists in the main material for the formation of contracts of international sale of goods and services and international industrial cooperation.

#### **Master program “Commercial intermediary activity”**

**Electronic commerce.** Essence, the meaning and role of electronic commerce in the modern sector of the global and domestic economy, electronic commerce tools discussed on the base of global Internet, the scope and basic principles of e-commerce. Special attention is paid to the characteristics of the basic forms and electronic commerce

---

projects (including electronic shopping, electronic auctions, electronic trading platforms) electronic payment, the specific provision of certain services. The questions analyzing the effectiveness of electronic commerce and its legal support.

**Merchandising.** It is assumed that issues such as inventories control in retail trade, effective product placement in stores, marketing communications at point of sale, the efficiency of sales staff. The purpose of discipline is to get students' knowledge and skills in modern techniques, mechanisms and tools merchandising. Task of discipline aimed at forming students' competence in relation to: display of goods on the equipment exposition, placing advertisements in shopping areas, the possibility of presenting the greatest possible range of goods.

**The technology of direct sales.** Questions of discipline cover a particular organization and planning of direct sales, the steps in the implementation process of direct selling methods and algorithms for decision-making process of personal selling to businesses of any type of business. The aim of the course is to get students' knowledge on the organization of effective sales and service, making believers industrial, of organizational and scientific solutions on the level modern requirements.

**Technology retailer trade.** The purpose of discipline is to develop knowledge and skills in sustainable construction trade companies, the ability to design commercial and technological processes implemented in the trade of scientific and technological progress. Task of discipline is to understand and study the complex issues that reveal the content and features of retailers. Particular attention is paid to the principles of trade and technological processes, factors that affect the efficiency of commercial and technological processes, methods retailing goods.

### **Master program “Advertising Management”**

**Management of advertising projects.** Discipline provides training in planning and managing advertising projects, particularly in the following areas: project environment affecting the project (internal and external factors), the formulation of the project – setting goals, objectives and strategies of the project, planning the project – a system of measures for the project, technical performance – direct technical execution points to the project plan, project management – monitoring the implementation of the project according to plan.

**Brand management.** The main role of brand management is to integrate the processes of creation, management and evaluation of brands aimed at increasing their value to consumers. The purpose of discipline – to provide students with opportunities for acquiring systemic knowledge of the theory and practice of brand management. Objective: To ensure the formation of competencies in the following areas: understand the nature and principles of brand management in the enterprise, the purpose of brand manager, background of effective brand management, brand management relevance in the marketing structure of the company.

**Creativity in advertising.** The purpose of teaching the discipline – is gaining undergraduates knowledge of methods and technologies creativity in advertising in different ways the media and printing, forming creative thinking, practical skills and abilities in the field of advertising and the use of of special and reference literature on creativity in practical economic activity. Task of of the discipline is to learn the basic directions of creativity in advertising, principles and methodological approaches to the generation of new ideas in advertising from the standpoint of various art schools, acquiring skills in analyzing the effectiveness of advertising messages in different media.

**Psychology of advertising.** The purpose of discipline is the most comprehensive deepening of knowledge and theoretical knowledge and practical skills in the field of psychology of advertising and psychological dynamics of interaction in the “advertising-consumer” in order to meet the challenges of designing effective advertising mental

---

images of products (services), skills development and use of special psychotechnologies advertising to promote products on the market. Task of discipline is to obtain knowledge on the formation of undergraduates in the population effective advertising images (image) of goods (services) about the future users (target groups). As well as providing advertising appeals memorize, the implementation of effective advertising effects on consumer behavior, awakening in them a desire to purchase goods (services) that is advertised.

*Research oriented disciplines*

**Master Program “Scientific and Methodological Foundations of Marketing and International Trade”**

**Methodology and organization of scientific research.** The main purpose of the discipline is to develop knowledge of methodology, theory method and process, psychology, methodological support research activities at the student level, the stages of Graduate Studies. The curriculum also provides a culture and skills of research, practical implementation of the results of the organization.

**Mathematical models in management and marketing.** The purpose of discipline is to develop students' mathematical knowledge to solve problems in professional activities, analytical thinking skills and mathematical formulation of economic problems arising from the management.

**Innovative Marketing.** Purpose of the discipline: the formation of the students – future marketing professionals a scientific outlook and expertise in the theory and methodology of modern marketing development of skills and capacity to perform management functions in the company on the basis of modern marketing to meet the needs of consumers and to ensure the effective operation of the enterprise.



**Master Training**  
**in specialty “MANAGEMENT OF ORGANIZATION AND ADMINISTRATION”**  
**Branch of knowledge “Management and Administration”**

<b>Form of training, licensed number of students:</b>	
– full-time	<b>60</b>
– correspondence	<b>50</b>
<b>Term of study</b>	<b>1,5 years</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian</b>
<b>Qualification of graduates</b>	<b>master's degree in management of organizations and the administration, manager of the organization</b>

**The concept of training**

The main task of training masters in management of organizations and the administration is to teach them to make their own decisions, to carry out scientific research activities in the relevant areas and to give practical advice to the production from such actual problems of the agro-industrial sector, the development and implementation of economic policy, planning, forecasting, economic-organizational and research functions, which are necessary for organizing and rational use of material-and-technical potential of agricultural sector; improvement of the efficiency and reliability management, introduction of new progressive organizational forms; improvement of methodology of economic analysis, forecasting of investment activity, elaboration of business-plans and justification of managerial decisions; the right the practical application of the provisions of the legislation of Ukraine on the issues of financing, crediting and taxation of enterprises, institutions and organizations of the agro industrial complex.

**Production oriented master program**

***Master program “Management of enterprise strategic development”***

Program of training specialists for the management of activities and staffing of the biggest business groups and associations of integrated services organizational and strategic development, the activities of which provides comprehensive diagnostics of the condition of the organizational systems, implementation of innovative approaches, through the information system of crisis management by creating an effective institutional mechanism for ensuring the functioning of the subjects of the corporate interactions/

**Sphere of graduates employment**

Management of the structural divisions of the enterprises of the agrarian sphere.

***Master program “Management at the market of goods and services”***

This is the program of training of specialists for management of the activities of the various organizational units on the market, including the subjects of market infrastructure on the basis of the formation of competitive advantages of the organizations and their products. The future masters of management, studying for the master's program will receive theoretical knowledge and practical skills of increase of competitiveness of a certain kind of products or services through the system of organizational measures, including motivational.

**Sphere of graduates employment**

Management of the structural divisions of the enterprises of the agrarian sphere.

***Master program “Management of quality”***

This is the program of training specialists for building the quality management system with regard to the objectives and policies in the information management of the quality of products, methodologies and analysis of indicators of quality, perfection of processes of functioning of system of quality assurance. Graduates of this master's program will have the opportunity to improve the efficiency of economic activities affecting their units through the use of modern approaches to management, built on the criteria of quality of management of an enterprise or organization, and the quality of the offered products and services.

**Sphere of graduates employment**

Management of the structural divisions of the enterprises of the agrarian sphere.

***Master program program “Management in the sphere of economic competition”***

This is the study of theoretical aspects of management in the sphere of economic competition put in a basis of this program. Training of experts on management in the sphere of economic competition is conditioned by the strengthening of the competitive pressure on businesses that require the implementation of a systemic approach to the formation of a complex of measures to ensure competitiveness, competitiveness and competitive persistent enterprises.

**Sphere of graduates employment**

Management of the structural divisions of the agrarian enterprises.

**Research oriented master program**

***Master program program “Scientific approaches for efficient management in the market of goods and services”***

Program of training specialists on the issues of formation and functioning of the system of management of the economic entities in the market of goods and services, oriented at provision of effective responses to the needs of consumers with the use of innovative approaches in management. Graduates will possess appropriate scientific-designed tools of analysis and choice of optimal managerial decisions, have the skills to develop their own proposals, improving existing approaches to the management of the market of goods and services.

**Sphere of graduates employment**

Post-graduate courses, the organization for rendering of consulting services in the sphere of management.

**Practical training**

The future masters of management at specific enterprises acquire the skills to work with modern methods of management, knowledge on technological issues of the work of the enterprise, the ability of self-control, to build a clear personal goals, problem-solving skills; and the ability to innovate; the ability to influence others; knowledge of modern management approaches; ability to manage; ability to train and develop subordinates; to carry out the management of the enterprise, knowledge of practical aspects of making managerial decisions.

---

**Proposed Topics for Master Theses**

1. Improvement of the system of enterprise labor potential management.
2. Improvement of the system of manager’s work and personal qualities evaluation.
3. Management of entrepreneurial activity and ways of its improvement.
4. Improvement of organization and motivation of labor at the enterprise.
5. Improvement of the management system in the sector of animal husbandry.
6. The development of the communications system in the management of enterprises.
7. Improvement of the process of adoption and implementation of managerial decisions.
8. Formation of the enterprises competitive strategies.
9. Formation of the quality management system of the enterprises activity of agro industrial complex.
10. Development of the strategy of personnel management at the enterprise.

**Academic rights of applicants for a master program**

Except the specialty “Management of organizations and the administration” of students with the diploma of the bachelor on a direction of training “Management” can continue their education on the specialties **of the branch of knowledge “Management and administration”**:

- 8.03060104 – “Management of foreign economic activity” (see pt. 389);

the specialties **of the branch of knowledge 1801 “Specific category”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Management of organizations and Administration”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Intellectual Property	1	72	1,3	2,0
2	Labour protection	1	72	1,3	2,0
3	Civil protection	1	72	1,3	2,0
4	Contract law	1	72	1,3	2,0
5	Methods and organization of scientific research	1	72	1,3	2,0
<i>Total number</i>			360	6,7	10,0
<i>1.2. Cycle of professional and practical training*</i>					
1	Public administration	1	108	2,0	3,0
2	Business Administration: Management of organization	1	108	2,0	3,0
3	Business management: corporate management	2	108	2,0	3,0
4	Business Administration: Change Management	2	108	2,0	3,0
5	Business Administration: Project Management	2	108	2,0	3,0
6	Business Administration: Quality Management	2	108	2,0	3,0
7	Financial Management	2	108	2,0	3,0
8	Information systems and technology in the management of the organization	2	108	2,0	3,0
<i>Total number</i>			864	16	24,0
<i>Total according to regulatory part</i>			1224	22,7	34,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of professional and practical training*</i>					
1	Investment Management	2	108	2,0	3,0
2	Agricultural Policy	2	72	1,3	2,0
3	Business protocol and negotiation	3	72	1,3	2,0
4	Business Game (Business Management)	2	72	1,3	2,0
5	Business foreign language	1	72	1,3	2,0
6	Psychology of Management and Conflict studies	1	108	2,0	3,0
<i>Total chosen by university</i>			504	9,3	14,0
<b>2.2. Disciplines chosen by students</b>					
<i>2.2.1. Cycle of professional and practical training*</i>					
Production oriented disciplines					
Master program "Management market of goods and services"					
1	Market Infrastructure Management	2	108	2,0	3,0
2	Management of marketing communications and competitiveness	2	108	2,0	3,0
3	Management of potential of enterprise	2	108	2,0	3,0
4	Management of companies activity on the market of goods and services	2	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
Master program "Quality Management"					
1	Complex system of quality management of products and services	2	108	2,0	3,0
2	Information management of quality of work and product	2	108	2,0	3,0
3	Management of potential of quality	2	108	2,0	3,0
4	Quality management in corporations	2	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
Master program "Management in sphere of economic competition"					
1	Management of competitiveness of enterprises	2	108	2,0	3,0
2	Management of potential of of enterprise	2	108	2,0	3,0
3	Risk Management and Economic Security	2	108	2,0	3,0
4	Business Ethics and Social Responsibility of business	2	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12
Master program "Management of strategic development of company"					
1	Management of organizational development of company	2	108	2,0	3,0
2	Anticrisis Management	2	108	2,0	3,0
3	Diagnosis in the management system	2	108	2,0	3,0
4	Management of innovation activity of company	2	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
Research oriented disciplines					
Master program "Scientific approaches of ensuring the effectiveness of management on market of goods and services"					
1	Management of financial sanation and bankruptcy	3	108	2,0	3,0
2	Mathematical Models in Management and Marketing	3	108	2,0	3,0
3	Business Planning of innovation projects	3	108	2,0	3,0
4	International standardization and certification of technologies, raw materials and finished products	3	108	2,0	3,0
<i>Total selected by the students</i>			432	8,0	12,0
<i>Total number of elected part</i>			936	17,3	26,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
	Practical training		432	8,0	12,0
	Writing and defense of master's thesis		648	12,0	18,0
	Total for specialty		3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotation of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of humanitarian, social and economic training\**

**Intellectual Property.** Learning discipline is important for the intensive development of the rights of intellectual property, turning them into an important factor in the competitiveness of enterprises and the economy as a whole. Purpose of the discipline – to form a complex theoretical knowledge on intellectual property as a decisive economic and legal category of information society.

**Labour protection.** Purpose of the discipline is to form future professionals in skills and competencies for effective safety management and improve working conditions, taking into account scientific and technological progress and international experience, as well as awareness of the indissoluble unity of successful professional activities must comply with all the safety requirements work in a particular area.

**Civil protection.** The purpose of discipline is to develop students' ability to think creatively, solve complex problems of innovative character and make productive decisions in the field of civil protection, allowing for the future careers of graduates, as well as scientific and technological progress.

**Contract law.** The purpose of teaching of discipline by students of management in directing training – competition of legal knowledge, which regulates the procedure for the conclusion, performance and termination of commercial contracts of various kinds. Study of subjects gives the following knowledge: basic categories of contract law and the procedure of concluding agreements, including commercial contracts, especially the content of certain types of agreements in the sphere of economic activity, bringing order to the legal liability of contractual relations for breach of contract.

**Methods and organization of scientific research.** The main purpose of the discipline is to develop knowledge of methodology, theory method and process, psychology, methodological support research activities at the student level, the stages of Graduate Studies. The curriculum also provides a culture and skills of research, practical implementation of the results of the organization.

##### *1.2. Cycle of professional and practical training\**

**Public administration.** The purpose of discipline is to master the theoretical knowledge of public administration and the acquisition of practical skills to apply the laws, principles, methods, techniques, and procedures in the management of public sector by subjects, the acquisition of skills and the formation of competencies required to perform the functions and powers of the head (specialist) of the public administration, including for public authorities: local authorities.

**Business Administration: Management of organization.** The purpose of discipline is to master the theory and practice of effective management of the organization in a changing socio-economic environment. The objectives of study of subjects are: standardization of future professionals of contemporary systems thinking and complex special expertise in the management of the subsystems at all stages of its life cycle in relationship with the environment.



**Business management: corporate management.** The purpose of discipline – to familiarize students with the theoretical foundations of corporate governance, institutional and informational tools functioning corporate governance system in enterprises.

**Business Administration: Change Management.** The purpose of discipline: mastering practical knowledge and practical skills of organization management process. The task of the discipline: understanding of changes and nature of their occurrence, formation of students' scientific outlook and knowledge of the technologies and practices of change management in organizations, the study of the functioning of organizations in conditions of continuous change.

**Business Administration: Project Management.** The main purpose of the discipline is to form future professionals of appropriate practical skills application of universal tool design and implementation of universal projects in order to achieve effective existence and development organization. The main objectives of the discipline is to provide scientific and methodological basis for student mastery of basic project management tools in an organization.

**Business Administration: Quality Management.** The purpose of discipline is to develop students' knowledge of the theory and methodology of quality management principles of construction and operation of the quality management system, acquiring legal, organizational and economic issues related to quality management. The main objectives of the discipline is the theoretical and practical training for students on work organization and management to ensure quality.

**Financial Management.** The purpose of discipline is to develop in students of modern economic thinking and system special knowledge in the field of government finance companies use their practical skills in various areas of financial activity.

**Information systems and technology in the management of the organization.** The goal of teaching of discipline is to develop future managers in knowledge and skills in modern information systems and technologies, their rational use, as well as practical skills of effective use of modern information technologies in the implementation of management within the organization.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professional and practical training\*

**Investment Management.** The purpose of discipline is to develop in students of modern economic thinking and system special knowledge in the field of investment activity of enterprises, relevant competencies based on the assimilation of basic theoretical principles and mastering practical skills necessary to effectively carry out these activities in the enterprise.

**Agricultural Policy.** This discipline introduces future professionals with the basics of policy-making in agriculture. Studied both domestic and foreign experience. As a result of mastering the material students are able to in a professional manner to form an opinion about the processes and phenomena occurring in the agricultural sector of the state.

**Business protocol and negotiation.** The discipline studies the modern requirements to the management, in particular in the areas of business Protocol and ethics as an essential component, the responsibility of enterprises – the first step to ethical conduct, preparation for negotiations, the introduction of negotiations (the main stages and their characteristics), negotiation techniques, style of negotiation, analysis of the results of the negotiations and implementation of the reached agreements and the rules and regulations for conducting business meetings, the main points of agreement a business meeting, preparation of premises and a meeting of the delegation.

**Business Game (Business Management).** The main purpose of teaching of discipline is to develop students' competence in relation to the basic principles, the basic categories of modern concepts, theoretical principles and practical methods of management of enterprises

---

main business and skills development of operational strategy, creation and use of sectoral operational subsystems as the basis for achieving the organization's mission.

**Business foreign language.** The overall objective of the program of foreign language of teaching professional direction is to develop students' professional language skills that will contribute to their effective functioning of the cultural diversity of educational and professional environment.

**Psychology of Management and Conflict studies.** The purpose of discipline is to explore the general principles and mechanisms of formation and development of cognitive mental processes, properties, states and communities. Task discipline – to form a system of theoretical and methodological knowledge of the problems of psychological science and practice, knowledge of the structural elements of the mind – mental cognitive processes, properties, classes and structures at reproduction and interpretation for practical application and implementation in the future professional activity manager.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical training\**

#### *Production oriented disciplines*

#### **Master program “Management market of goods and services”**

**Market Infrastructure Management.** The purpose of the following courses: master the theory of commodity market infrastructure as an essential part of the market economy, the practical ability to control its activities to promote, storage and sale of goods and services to meet the needs of consumers, the ability to find and implement solutions for intensification and efficiency in this area. Objectives of the course: to know the nature of the commodity market infrastructure and its role in a market economy, the types and conditions of an effective infrastructure of individual links of the commodity market.

**Management of marketing communications and competitiveness.** Purpose of the discipline: the formation of the students – future managers a scientific outlook and special knowledge in the theory, methodology, marketing, development of skills and capacity to perform management functions in the company from marketing to customer satisfaction and ensure the effective operation of the enterprise.

**Management of potential of of enterprise.** The purpose of discipline is to increase the efficiency of organizational structures through the proper use of managers of different levels of management principles and tools, creating an integrated system of administrative organization.

**Management of companies activity on the market of goods and services.** The main purpose of teaching of discipline is to develop in future managers in modern management thinking and systems of special knowledge in management, forming an understanding of the conceptual foundations of system management organizations, acquiring skills of analysis of internal and external environment, making appropriate management decisions.

#### **Master program “Quality Management”**

**Complex system of quality management of products and services.** Purpose of the discipline – form in students a system of knowledge of the theory and methodology of quality management principles of construction and operation of quality management systems for different types of products (goods and services), the study of regulatory and legislative, institutional and economic issues of quality control of goods (services). The main objectives of the course: learning the terminology of the quality management system, acquisition problem as at present and its impact on the economy, the study of national and international experience in quality control of products for its further development, creation and implementation of quality products, the use of the methodological foundations of

management: general approaches, principles and methods of work regarding the quality of goods.

**Information management of quality of work and product.** The goal of teaching of discipline is to develop the basic knowledge and skills acquisition needed for resource management in terms of quality. The aim of the discipline is to provide knowledge about the theoretical and methodological foundations of information quality management, the main provisions of Information Quality Management; nature of information as a resource of quality, nature and basic principles of a systematic approach to the processing and use of information in quality management.

**Management of potential of quality.** The main objective of discipline – form in students a stable knowledge of management theory as a potential to help acquire skills to independently develop measures to improve the quality of management potential. The main task consists of the following components: provide insight into the nature of the main categories of potential management quality; reveal capacity building quality, consider the potential quality management system and its regulatory framework, consider forming a comprehensive and qualification of potential quality.

**Quality management in corporations.** The goal: formation of knowledge of the basic principles, categories, methods and tools of quality management in modern companies, summarizing the main achievements of the theory and practice in the field of quality management, to show the need for these achievements in all areas of the corporation, to form an idea of the systematic organization of the processes of the quality management the corporation that meets international standards. Objective: disclosure of the nature of basic theoretical principles of the modern concept of quality management in the corporation, appointment and review mechanism for applying classical and modern methods and tools of quality management in the current business corporations.

#### **Master program “Management in sphere of economic competition”**

**Management of competitiveness of enterprises.** Discipline aims to teach students to evaluate the competitiveness of enterprises, to identify the factors shaping it. As a result of its study of future specialists are able to not only determine the competitiveness of an enterprise, but also have the knowledge to develop a system of measures for its improvement.

**Management of potential of of enterprise.** The purpose of discipline is to increase the efficiency of organizational structures through the proper use of managers of different levels of management principles and tools, creating an integrated system of administrative organization.

**Risk Management and Economic Security.** Studied theory of ontology and epistemology of risk and economic security, examines the nature, perception and systemic risk analysis in economics and entrepreneurship, the system is considered objective and subjective quantitative estimates of risk and economic security, risk management, and modeling of economic risk and economic security: the concept of game theory, studied multicriteria multi-game models of economic problems playing hierarchical model study of multi multicriteria decision making.

**Business Ethics and Social Responsibility of business.** The object of discipline - business communication, its subject matter - the moral and psychological aspects, ethical and psychological mechanisms. Business ethics and social responsibility of business - a new training course, which includes a variety of science (ethics, psychology, philosophy, sociology) and practices (Management et al.). However, the most essential components are ethics, psychology and management science dealing with human nature and learn the same nature of human behavior (but from different angles) and the factors that affect the livelihoods of people and their interaction.

---

**Master program “Management of strategic development of company”**

**Management of organizational development of company.** Discipline is intended to help students master a wide range of issues related to organizational performance and characteristics of modern enterprises (restructuring, reengineering business processes, virtual business and other new organizational types) and their specific integration activities.

**Anticrisis Management.** The purpose of teaching of discipline – the formation of knowledge and skills of crisis management enterprise – recognition and diagnosis of the crisis, predicting the effects of the crisis and its impact on enterprise performance, identify opportunities for prevention and operation of enterprises in the management and liquidation of consequences of the crisis, the adoption and implementation of anti-crisis management decisions.

**Diagnosis in the management system.** The purpose of discipline is to provide knowledge about the use of analytical tools and economic instruments for diagnostic management. The main objectives of the course are: the consideration of the features of industrial and economic activities of domestic enterprises and justify assumptions and factors that make a significant impact on domestic economic mechanism of each company, generalization and systematization of knowledge in mastering the skills of the implementation of economic diagnostics in different directions to ensure effective management business.

**Management of innovation activity of company.** The aim of this subject is to provide students with the latest knowledge in strategic management of innovative enterprise development and the acquisition of practical skills for the development of risk management in order to optimize the level of risk in the innovation enterprise.

*Research oriented disciplines*

**Master program “Scientific approaches of ensuring the effectiveness of management on market of goods and services”**

**Management of financial sanation and bankruptcy.** The purpose of discipline is to provide the knowledge to determine the nature of the financial sanation and bankruptcy, the mechanism of preparation and implementation of the plan sanation of the debtor company, the operation of such categories as pre-court reorganization, readjustment of enterprises through the courts, bankruptcy, forming students' theoretical and methodological framework needed to fluency issues of reorganization and bankruptcy, the skills to determine the ability of the enterprise sanation and evaluation procedures sanation and liquidation the debtor company.

**Mathematical Models in Management and Marketing.** The purpose of discipline is to develop students' mathematical knowledge to solve problems in professional activities, analytical thinking skills and mathematical formulation of economic problems arising from the management.

**Business Planning of innovation projects.** The main purpose of teaching is to master the basics of modern theoretical and practical skills of innovation management organization. The main tasks that need to be addressed in the process of teaching is theoretical training of students and forming their skills in the field of innovation management organization.

**International standardization and certification of technologies, raw materials and finished products.** Purpose of the discipline – to master scientific and theoretical foundations, methodological and organizational issues of standardization and certification of technologies, raw materials and finished products. Target courses: learning the basics of standardization and certification of quality products, methods for assessing its level, perspectives of international standardization and certification, developing abilities to use legal and technical documents for the solution of practical problems of certification technologies, raw materials and finished products.

---

**Master Training**  
**in specialty “MANAGEMENT OF FOREIGN ECONOMIC ACTIVITIES”**  
**Branch of knowledge “Management and administration”**

**Form of training, licensed number of students:**

– full-time 125

– correspondence 60

**Term of study** 1,5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian, English

**Qualification of graduates** master's degree in management of foreign economic activity, manager of the foreign-economic activity

**The concept of training**

The main task of preparation of masters of management of foreign economic activity is the provision of international and joint enterprises and organizations in the sphere of agrarian business professionals who would be able to carry out planning and forecasting activities of subjects of foreign economic activities (divisions); forecasting of the dynamics of demand in export and import products; development and substantiation of directions and means of expansion of commodity markets of subjects of foreign economic activity; to take effective management decisions in the implementation of foreign economic activities; organize the foreign economic activity of the economic subject in order to achieve its mission; to manage the quality and competitiveness of domestic products in the world market; organization of commercial activity in the international markets; currency-financial management of foreign economic activity; organization of advertising activity of subjects of foreign economic activity; formation of the image of enterprises on a foreign market; control of the foreign economic operations; report on foreign economic activity.

**Production oriented master program**

***Master program “International business Administration”***

The program provides a combination of study of business disciplines in the global context, with the understanding of the specificity of cultural and social processes in different countries. Graduates will be prepared for the management of work in which it is important to consider the economic and cultural diversity of the real subjects of the market. Apart from fundamental knowledge in the field of foreign economic activity of the graduates will have knowledge of market analysis, decision-making, and the project activities. In addition, they will be able to understand the specifics of the other crops, which will allow them to work in different countries, in a multinational, multicultural environment.

**Sphere of graduates employment**

Management of the structural divisions of international companies and entities of foreign economic activity of the domestic enterprises of the agrarian sphere.

***Master program “International business activity”***

The program provides training of specialists, which will be correctly oriented in the situation on the international market is constantly changing and will be skillfully use in its activities the benefits of the global market; to organize and carry out foreign economic operations; evaluating the economic efficiency of foreign economic operations; to develop

foreign trade contracts and conduct negotiations with representatives of foreign firms; to carry out foreign trade activities, using the main forms and methods of foreign economic activity.

### **Sphere of graduates employment**

Management of the structural divisions of international companies and entities of foreign economic activity of the domestic enterprises of the agrarian sphere.

### **Research oriented master program**

#### ***Master program «Investigation of the world conjuncture of the agrarian markets»***

This is the program of training of researchers for scientific work on the development of methods of short – and long-term forecasting of the indicators of foreign economic activity and the strategy of entering the foreign market with regard to the factors of influence on the development of foreign trade, tariff and non-tariff instruments of regulation of export-import operations. The program allows you to acquire knowledge in the analysis of the factors that shape the market conjuncture and explore its agricultural segment.

### **Sphere of graduates employment**

Post-graduate student, analytical divisions of international companies and organizations working in the agrarian market.

### **Practical training**

The future masters of management of foreign economic activity get skills of work with modern methods of management, proceeding from the tasks set in front of the participants in international trade, in the first place, joint ventures and international corporations. Considerable attention is paid to the work of the domestic enterprises and the organizations, which have access to the world market. Taking into account the specifics of trade operations in the partner countries, students learn to apply the generated in the process of training material in accordance with any situation that may arise in the negotiation of international agreements.

### **Proposed Topics for Master Theses**

1. Trade and economic cooperation of Ukraine with the EU member States.
  2. The foreign economic security of the state in conditions of European integration of Ukraine.
  3. Organizational-economic mechanism of creation and functioning of joint ventures in Ukraine.
  4. International leasing in the conditions of market transformation of Ukraine.
  5. The marketing strategy of companies of European countries and the experience of their implementation in Ukraine.
  6. Enterprise risk management at an output on the foreign markets.
  7. World trade in agricultural products and prospects of development of the Ukrainian export.
  8. The export potential of grain industry of Ukraine.
  9. Ukraine external trade in the агропродовольчою products in the conditions of globalization of the world economy.
  10. Competition on the world markets of agricultural products.
-

**Academic rights of applicants for a master program**

Except the specialty “Management of foreign economic activity” students with the diploma of the bachelor on a direction of training “Management” can continue their education on the specialties **of the branch of knowledge “Management and administration”**:

- 8.03060101 – “Management of organization and administration” (see p. 379);

the specialties **of the branch of knowledge 1801 «Specific category»**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Management of foreign economic activities”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Intellectual property	1	72	1,3	2,0
2	Labor safety in industry	1	72	1,3	2,0
3	Civil protection	1	72	1,3	2,0
4	International private law	2	72	1,3	2,0
5	Methodology and organization of scientific research	1	72	1,3	2,0
<i>Total number</i>			360	6,7	10,0
<i>1.2. Cycle of professional and practical training*</i>					
1	Management of foreign economic activities	1, 2	216	4,0	6,0
2	International marketing	1	162	3,0	4,5
3	Investment management	1	108	2,0	3,0
4	Information systems and technologies in management FEA	2	108	2,0	3,0
5	International credit-settlement and currency transactions	2	162	3,0	4,5
<i>Total number</i>			756	14	21,0
Total according to regulatory part			1116	20,7	31,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of professional and practical training*</i>					
1	Agrarian policy	2	72	1,3	2,0
2	Organization and technology FEA	1	72	1,3	2,0
3	Business protocol and negotiation	2	72	1,3	2,0
4	International economic activity	2	72	1,3	2,0
5	World agricultural and food resources	3	72	1,3	2,0
6	Stock exchange market	2	72	1,3	2,0
7	Business foreign language	1, 2	108	2,0	3,0
<i>Total chosen by university</i>			540	10,0	15,0
<b>2.2. Disciplines chosen by students</b>					
<i>2.2.1. Cycle of professional and practical training*</i>					
Production oriented disciplines					
Master program “International commercial activity”					
1	International trade	3	72	1,3	2,0
2	Business game "Business management"	3	72	1,3	2,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
3	Logistics in FEA	3	72	1,3	2,0
4	Risk management in international commercial activities	3	72	1,3	2,0
<i>Total selected by the students</i>			288	5,3	8,0
Master program "International business Management"					
1	International business	3	72	1,3	2,0
2	Strategies in international business	3	72	1,3	2,0
3	International customs regulation	3	72	1,3	2,0
4	Business game "Business management"	3	72	1,3	2,0
<i>Total selected by the students</i>			288	5,3	8,0
Research oriented disciplines					
Master program "Investigation of the world conjuncture of the agrarian markets"					
1	Mathematical models in management and marketing	3	72	1,3	2,0
2	International customs regulation	3	72	1,3	2,0
3	Organization and regulation of foreign economic activities	3	72	1,3	2,0
4	Model in planning and forecasting FEA	3	72	1,3	2,0
<i>Total selected by the students</i>			288	5,3	8,0
Total number of elected part			828	15,3	23,0
Practical training			432	8,0	12,0
Writing and defense of master's thesis			648	12,0	18,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### *1.1. Cycle of humanitarian, social and economic training\**

**Intellectual property.** The study of discipline is importance during the intensive development of the market of the rights to objects of intellectual property, their transformation into an important factor of competitiveness of the enterprise and the economy in general. Purpose of study of discipline – a set of theoretical knowledge on intellectual property issues as the defining economic and legal category of the information society.

**Labour protection in the industry.** Purpose of study of discipline is the formation of future specialists with the skills and competencies to ensure effective management of labour protection and improvement of working conditions with regard to the achievements of scientific and technical progress and international experience, as well as in the realization of the unity of the successful professional activity with obligatory observance of all requirements of labor safety in a particular industry.

**Civil protection.** The purpose of discipline study is forming the students ability to think creatively, solve complex problems of the innovative character and make effective decisions in the sphere of civil protection, taking into account the peculiarities of the future professional activity of graduates, as well as scientific and technical progress.

**International private law.** The purpose of teaching students managerial direction of training – getting the system of legal knowledge, regulating the procedure of conclusion, implementation and termination of international agreements of different types. Study of the discipline gives the following knowledge: main categories of private international law; the procedure for the conclusion of contracts, in particular treaties; features of the maintenance of separate kinds of contracts in sphere of international activity; procedure of bringing to the legal liability of the subjects of the contractual relationship for breach of contract.



**Methodology and organization of scientific research.** The main purpose of study of discipline is formation of knowledge about methodology, theory, method and process, psychology, methodological support of the research activities at the undergraduate level, the stages of graduate studies. Curriculum also provides for the formation of culture and skills to conduct research, introduction of their results in practice of activity of the organizations.

*1.2. Cycle of professional and practical training\**

**Management of foreign economic activities.** The aim of teaching the discipline is formation at students of managerial thinking, system of knowledge and acquire practical skills in management of foreign economic activity (FEA). The results of the study is to develop in students a system of thinking about the process of management of foreign trade activities; obtaining practical skills of application of diverse instrumentation and control technology for consideration of specific situations in the field of foreign trade.

**International marketing.** The purpose of discipline - forming students ' theoretical and practical knowledge in the sphere of international marketing activities needed to achieve business objectives in international business. The subject of the discipline set of principles of the integrated system of management for the international marketing activities of the company and realization of the basic functions of marketing in the international business.

**Investment management.** Purpose of discipline is formation at students of modern economic thinking and the system of special knowledge in the field of investment management companies, the respective competence based learning basic theoretical positions and acquisition of the necessary skills to effectively carry out these activities at the enterprise.

**Information systems and technologies in управлінні FEA.** The purpose of the discipline is formation of system of special knowledge and practical skills in the use of information systems and technologies in foreign economic activity of enterprises, acquaintance with the methods of work of the Manager with means of handling foreign-economic information, modern software and etc.

**International credit-settlement and currency transactions.** The purpose of discipline is to form students ' conscious of belonging to a deepening of Ukraine's integration into the world community through the ability to perform credit-settlement and currency transactions. Task of the course is mastering by the students of theoretical knowledge and practical skills execution credit-settlement and currency operations when servicing foreign economic activity of exporters and importers.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training\**

**Agricultural policy.** The course acquaints future specialists with the basics of the formation of policy in the agrarian sphere. Studied both domestic and foreign experience. As a result of learning the students get the opportunity on a professional basis to form their own opinions about the processes and phenomena taking place in the agrarian sector of economy of the state.

**Organization and technology IEO.** Purpose of discipline is for students to acquire systematic knowledge of objective laws, conditions, processes and specific features of foreign economic activity, as well as acquiring skills of their practical use. The result of study of discipline is formation at students with a holistic view of processes in the sphere of foreign trade activities and formation of students skills and practical skills of using the acquired knowledge regarding the application of information database for the analysis of

the global economic environment with the purpose of a choice of strategy of entering the foreign markets.

**Business protocol and negotiation.** The discipline studies the modern requirements to the management, in particular in the areas of business Protocol and ethics as an essential component, the responsibility of enterprises – the first step to ethical conduct, preparation for negotiations, the introduction of negotiations (the main stages and their characteristics), negotiation techniques, style of negotiation, analysis of the results of the negotiations and implementation of the reached agreements and the rules and regulations for conducting business meetings, the main points of agreement a business meeting, preparation of premises and a meeting of the delegation.

**International economic activity.** The purpose of teaching is formation of future managers of the system of special knowledge on the problems and prospects of development of international economic relations for the fundamental and special education and practical work on speciality. The result of study of discipline is formation of a holistic understanding of the processes that characterize the level of international cooperation of national economies and the formation of students skills and abilities of the use of acquired knowledge for independent analysis of global processes.

**World agriculture and food resources.** The main purpose of study of discipline is deep learning students regularities of development of world agriculture, arm the future specialists systematized and generalized knowledge about agricultural economy of individual countries and regions in the context of global trends in agricultural production and international relations.

**The exchange market.** The discipline gives the students an idea about the basic tools of the trade that are used on the world stock market. The future specialists in marketing on the example of the stock market study process of the birth of commodity prices and examine the factors affecting such.

**Business foreign language.** Overall purpose of the programme of teaching foreign languages in professional direction is to develop in students of professional language skills that will facilitate their effective functioning in the cultural diversity of the academic and professional environment.

## *2.2. Disciplines chosen by the students*

### *2.2.1. Cycle of professional and practical training\**

#### *Production oriented disciplines*

#### **Master program “International commercial activity”**

**International commercial activities.** The purpose of this course is to provide formation of system of knowledge and skills of future businessmen to establish good business on the international market of goods and services. The objective of the course is to teach the future specialists form the optimal proportions between production and adjacent spheres of activities, to ensure an efficient flow of goods and services, set up dynamic market balance. The task of the course includes the study of scientific-theoretical bases of international commercial activity on the world market of goods and services in the sphere of commercial services, management of commercial activities.

**Business game (Business management).** The main goal of teaching is to develop students ' competence in relation to the basic principles, main categories, modern concepts of theoretical principles and practical methods of management of main activities of the enterprises and skills development of the operational strategy of creation and use of industry operating subsystems as the basis of ensuring the achievement of the organization's mission.

**Logistics in foreign trade.** The main purpose of teaching is formation of future professionals system knowledge and understanding of the conceptual foundations of logistics in the VEDAS, the theory and practice of development of this direction and skills of self-learning regarding modern methods of management of material and other threads in modern conditions.

**Risk management in international business activities.** Objective: students to acquire knowledge of the terminology of the theory of risks in international business activities, risk assessment, methods for measuring them under uncertainty and protection. Objectives: to expand and deepen knowledge about the qualitative and quantitative properties of the economic processes taking into account the risk; mastery of methodology and methods of construction, analysis and application of economic-mathematical models, taking into account risk; mastering of the basic ways and methods of evaluation and optimization of the risk; the study of the foundations of the strategy of international risk management.

### **Master program “International business Management”**

**International business.** Objective: to provide students with the necessary amount of knowledge about the specifics of the functioning of a modern international business and the specific analytical approaches to the study of the external economic environment and formation of strategy of behavior of enterprises in foreign markets. Provides that students study the theoretical categories and principles of international business and provide the preparation and conclusion of international agreements (contracts).

**Strategies in international business.** The main goal of teaching is to master the modern theoretical fundamentals of strategic management and practical skills of strategic decision-making in the management of the activity and development of enterprises on the international market. The main tasks which should be solved in the process of teaching is the theoretical training of students and the formation of skills in the sphere of strategic management of the enterprise when building an international business.

**International customs regulations.** The objective of the course is to have students realize the place of the law governing the international customs relations, in the system of norms of international law, the value of such standards and their indissoluble connection with their practical application by the relevant authorities. Task of the course is acquaintance with the most important sources of international customs regulation; assimilation of the most important normative acts, ability to work with them; knowledge of the principles of regulation and the ability to use their meaning at solving specific problems and issues.

**Business game (Business management).** The main goal of teaching is to develop students ' competence in relation to the basic principles, main categories, modern concepts of theoretical principles and practical methods of management of main activities of the enterprises and skills development of the operational strategy of creation and use of industry operating subsystems as the basis of ensuring the achievement of the organization's mission.

### *Research oriented disciplines*

### **Master program “Investigation of the world conjuncture of the agrarian markets”**

**Mathematical models in management and marketing.** The purpose of discipline study is forming students mathematical knowledge to solve problems in the professional activity, analytical thinking skills and the mathematical formulation of economic problems arising in the process of governance.

**International customs regulations.** The objective of the course is to have students realize the place of the law governing the international customs relations, in the

---

system of norms of international law, the value of such standards and their indissoluble connection with their practical application by the relevant authorities. Task of the course is acquaintance with the most important sources of international customs regulation; assimilation of the most important normative acts, ability to work with them; knowledge of the principles of regulation and the ability to use their meaning at solving specific problems and issues.

**Organization and regulation of foreign economic activity.** Studied the essence of the regulation of this sphere of activity as the public authorities and non-governmental bodies of management of the economy that are based on the Constitution of Ukraine and laws of Ukraine. The characteristic of the composition of the principles and functions of the national authorities and the international organizations involved in the process of regulation of foreign economic activity. Much attention is focused on the application of methods of regulation. In particular, the essence of the tariff (economic) and non-tariff (organizational-administrative methods of regulation, the scope and features of their application.

**Model in the planning and forecasting of the FEA.** Discipline teaches that in order to make the right decision, need more than just experience, expertise and intuition. You must be able to effectively and correctly apply, be able to choose the most suitable method to do this. Here to the aid of knowledge and statistics, mathematics and computer technologies. Simulation of foreign economic activity gives possibility to get a Manager's process model, the decision on development and management as it should take. Studying this model, experimenting with it, by setting different combinations of factors of influence, the Manager gets the opportunity to select the best solution from the set of all possible.

---

**Master Training  
in specialty “ADMINISTRATIVE MANAGEMENT”  
Branch of knowledge “Specific category”**

**Form of training, licensed number of students:**

– full-time 50

– correspondence 50

**Term of study** 1,5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian, English, German

**Qualification of graduates** master's degree in management of administrative activity

**The concept of training**

This specialization is directed on preparation of highly professional managers, capable to manage the agrarian business on the basis of possession of deep professional knowledge and skills, modern computer technologies, innovation and knowledge of foreign languages. Specialists have the right to hold Executive positions in organizations and enterprises of the agro-industrial production, as well as in the Central and local bodies of state power.

Specialty “Administrative management” (international version – MBA) is the highest level of business skills of a Manager and the most prestigious in the world program of business education. The specialty provides management training top managers of the new generation, competitive on the labor market, capable of creative professional activity and innovative methods of management in the conditions of global competition; giving listeners an integrated system of knowledge, which combine a full-fledged fundamental economic education with practical skills of managerial decision making, team work, negotiation and presentations for professional activity in the sphere of business management.

**Production oriented master program**

***Master program “Administrative management and marketing in the system of agribusiness”***

This is program of training of top-level and system analysts will be able to take strategic decisions in the conditions of risk, continuous development and improvement of entrepreneurial activity in a competitive environment.

**Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises of the agrarian sphere.

***Master program “Management of development of agrarian business entities”***

The program of training of specialists for management of the process of effective production in the agricultural regions of the enterprises by means of introduction of intensive technologies of production, reduce costs and increase economic efficiency of production.

**Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises of the agrarian sphere.

***Master program “Innovation management in AIC”***

This is the program management training of top managers of the new generation, competitive on the labor market, capable of creative professional activity and innovative methods of management in the conditions of global competition.

**Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises of the agrarian sphere.

***Master program “Environmental management in the agro-industrial complex”***

Program of training specialists for environmental management in agro sphere, environmental standardization and certification, quality management through the mechanism of harmonization of the system “nature-society” and the theoretic-methodological foundations of management.

**Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises the environmental field.

***Master program “Energy management”***

This is the program of training of specialists for management of energy service in the system of enterprises, technical diagnostics of power equipment, the organization of design objects of agricultural energy.

**Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises of energy sphere.

***Master program “Engineering management”***

The program of training of specialists for management of the system of mechanization of production in the agrarian sphere, modeling and forecasting of working processes in agribusiness, the designing of technological processes of diagnosis and repair of machinery and equipment.

**Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises of sphere of mechanization of agricultural production.

***Master program “Transport management”***

Program of training specialists for the management of transport enterprises based on current trends logistics policy, knowledge of modern transport infrastructure, the cost of services and key business processes.

**Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises of sphere of transport service.

***Master program “Management of land resources”***

This is the program of training of specialists for management of land resources, land use and land management on the basis of the legislative framework and taking into account the state of mechanisms and technologies of management of land resources.

---

### **Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises of sphere of land management.

**Master degree programs:** *“Management in branch of plant growing”, “Management in the field of gardening, vegetable growing in open ground and hothouses”, “Management in the sphere of production and processing of production of pig-breeding”, “Management in the sphere of production and processing of products of sheep-breeding”, “Management in dairy cattle breeding”, “Management in the sphere of production and processing of beef”, “Management in the field of poultry-keeping”, “Management in the sphere of production and processing of beekeeping products”, “Management in the field of aquaculture production”*

The program of training of specialists for the system of management in production and processing of relevant products on the basis of the greening of industry, solving the problems of quality and safety of products.

### **Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises of the respective spheres of production.

#### **Master program “Organization of management in veterinary medicine”**

Program of training specialists for the management of quality and safety of products of animal husbandry, management and marketing in veterinary medicine, the organization of a veterinary service and private veterinary practices, risk analysis in food production.

### **Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises in the sphere of veterinary medicine.

#### **Master program “Management in the sphere of protection of plants”**

Program of training specialists for the management and marketing in the sphere of protection of plants by means of the technical-economic justification of their use, research of methods and means of agrochemical security and service with the phytosanitary rights and international cooperation in plant quarantine.

### **Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises in the sphere of protection of plants.

#### **Master program “Management of the organizations (enterprises) of garden-park economy”**

This is the program of training specialists for the management of horticultural objects, taxonomy, and classification diversity of woody plants, organization of work for the operation of garden and Park facilities on the principles of nature management Economics.

### **Sphere of graduates employment**

Management of enterprises and structural subdivisions of the enterprises in the sphere of landscape gardening facilities.

#### **Master program “Management of the organizations (enterprises) of forestry”**

The program of training of specialists for management of state forest enterprises using the spatial analysis of forest objects, GIS-mapping of forest management enterprises and long-term monitoring of forest ecosystems.

---

### Sphere of graduates employment

Management of enterprises and structural subdivisions of the enterprises in the sphere of forestry.

### Practical training

Future students of the administrative management of specific companies gain working knowledge of modern management methods, knowledge of the process of the enterprise. Given the sector features master programs, students learn to apply their learning material according to any situation that may arise in agricultural production. All production problems are solved from the standpoint of organizational and human aspects.

### Proposed Topics for Master Theses

1. Management of the enterprise fixed assets process.
2. Management of foreign investment in Ukraine.
3. Management of on-farm production costs.
4. Management of the main capital in the agricultural enterprises.
5. Management of production of organic products in Ukraine.
6. Management of biofuel production in Ukraine.
7. The management of production crop production in Ukraine.
8. The strategic management of the production of agricultural goods.
9. Management of competitiveness of agricultural products.
10. The formation of an integrated risk management system of the enterprise.

### Academic rights of applicants for a master program

In addition to the specialty «Administrative management» applicants with a bachelor of science degree with all aspects of the training may continue training in other specialties industry **knowledge 1801 “Specific category”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010020 – “Educational Institution Management” (see p. 427)

### Curriculum for specialist training of the educational and qualification level “Master” in specialty “Administrative management”

No	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1, 2	108	2,0	3,0
<i>Total number</i>			108	2,0	3,0
<i>1.2. Cycle of professional and practical training*</i>					
1	Management of social and environmental safety activity: methodology and organization of empirical social research	1	90	1,7	2,5
2	Management of social and environmental safety activity: geographic information systems	2	72	1,3	2,0
3	Management information ties: economic Informatics	1	108	2,0	3,0
4	Management of informational communications: technology of presentation and "Web design"	3	72	1,3	2,0
5	Content management works	1	162	3,0	4,5
6	Management of human resources: personnel management	3	108	2,0	3,0



**MASTER DEGREE PROGRAMS**

No	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
7	Human resources management: business game (Business management)	2	108	2,0	3,0
8	Theory of organization: management and evaluation of projects	2	144	2,7	4,0
9	Theory of organization: organization and planning of entrepreneurship	2	144	2,7	4,0
10	Management of organization: the Economics of production	1	144	2,7	4,0
11	Management of organization: business management	1	144	2,7	4,0
12	Management of organization: quantitative methods of decision making	3	108	2,0	3,0
13	Organization management: strategic management	3	108	2,0	3,0
14	The head of administrative service	2	72	1,3	2,0
15	The technique of administrative activities	3	216	4,0	6,0
16	The legal basis of administrative activities	1	108	2,0	3,0
17	Audit and evaluation of management activities: automated accounting system	2	72	1,3	2,0
18	Audit and evaluation of management activities: analysis and control of enterprises	1	144	2,7	4,0
<i>Total number</i>			2124	39,3	59,0
Total according to regulatory part			2232	41,3	62,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional and practical training*					
1	International agribusiness	2	72	1,3	2,0
2	Agrarian policy	3	144	2,7	4,0
3	International marketing strategies	2	144	2,7	4,0
<i>Total chosen by university</i>			360	6,7	10,0
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training*					
Production oriented disciplines					
Master program Administrative management and marketing in the system of agribusiness»					
1	Management consulting	3	72	1,3	2,0
2	Introduction to scientific work	1	72	1,3	2,0
3	International economic activity of Ukraine	3	72	1,3	2,0
4	Management of foreign economic activities	3	72	1,3	2,0
<i>Total selected by the students</i>			288	5,3	8,0
Total number of elected part			648	12,0	18,0
Practical training			180	3,3	5,0
Writing and defense of master's thesis			180	3,3	5,0
Total for specialty			3240	60,0	90,0

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

*1.1. Cycle of humanitarian, social and economic training\**

**Business foreign language.** The overall purpose of the programme of teaching foreign languages in professional direction is to develop professional language skills in students that will facilitate their effective functioning in the cultural diversity of the academic and professional environment.

*1.2. Cycle of professional and practical training\**

**Management of social and environmental safety activities.** The discipline teaches how to prevent emergencies and respond to them, in particular, it foresees to study of the material in the following areas: risk identification in the social and ecological systems, sources of potential hazards of the external and internal environment, legislative and normative acts of the civil protection system, risk management in social and ecological systems.

**Management information ties.** The discipline is studied by future managers and is designed to provide the necessary knowledge on the theory and practice of application of modern information systems and technologies in management. The acquired theoretical knowledge and practical skills of work with information systems and technology will contribute to improving the performance of tasks of future professionals in the implementation of management activities.

**Content management works.** The main goal of teaching is to develop students competence in relation to the basic principles, main categories, modern concepts of theoretical principles and practical methods of management of main activities of the enterprises and skills of development of the operational strategy of creation and use of industry operating subsystems as the basis of ensuring the achievement of the organization's mission.

**Human resources management.** The aim of teaching is formation of a complex of theoretical knowledge and practical skills in the formation and implementation of personnel policy in modern organizations, rational selection of employees for the positions and the formation of an effective labour collective, evaluation and development of employees, as well as targeted use of their potential.

**Organization theory.** The main goal of teaching is formation of modern, on the basis of system approach, worldview regarding the establishment, functioning and evolution of the organizations. The main tasks that should be solved in the process of teaching the discipline is to provide students with knowledge of the theory and practice of functioning of the organizations in changing conditions of the modern market of the socio-economic environment, on the regulation of the processes that occur in the relationship with the external environment, etc.

**Management of organization.** The main goal of teaching is formation of future managers of the modern managerial thinking and the system of special knowledge in the field of management, formation of understanding of the conceptual foundations of the system of management of organizations; acquisition of skills for the analysis of the internal and external environment, making adequate managerial decisions.

**The head of administrative services.** The purpose of discipline is to familiarize students with the peculiarities of the profession, its content and objectives of management activities, the role of managers at different levels in the management of modern enterprises, peculiarities of training specialists in management.

**The technique of administrative activity.** The purpose of a discipline is to increase the efficiency of management of organizational structures through the proper use of the managers of different levels of principles and tools for administration, creation of complete system of administrative management of the organization.

**The legal basis of administrative activity.** The purpose of study of discipline is the need for training of management specialists who will work in the conditions of building a legal state and a market economy; the study of the totality of legal norms regulating social relations and forms during for Executive authorities of realization and protection of rights, freedoms and legitimate interests of physical and legal persons, as well as in the process of state administration of economic, socio-cultural and administrative-political construction in the state.

**Audit and evaluation of government activity.** The main goal of the study of the future managers of the discipline consists in formation of theoretical knowledge and acquisition of practical skills of organization and conduction of audit of financial reporting, and use of their results, as an information base making effective management decisions. The main task of discipline study is a thorough General economic and accounting and audit training specialists and mastering of the principles, means and methods of audit of their financial statements.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training\**

**International agribusiness.** The purpose of discipline is for students to acquire systematic knowledge of objective laws, conditions, processes and specific features of foreign economic activity, as well as acquiring skills of their practical use. The result of study of discipline is formation at students with a holistic view of processes in the sphere of foreign trade activities and formation of students' skills and practical skills of using the acquired knowledge regarding the application of information database for the analysis of the global economic environment with the purpose of a choice of strategy of entering the foreign markets.

**Agricultural policy.** The course acquaints future specialists with the basics of the formation of policy in the agrarian sphere. Studied both domestic and foreign experience. As a result of learning the students get the opportunity on a professional basis to form their own opinions about the processes and phenomena taking place in the agrarian sector of economy of the state.

**International marketing strategies.** The main goal of teaching is to master the modern theoretical basics of strategic marketing management and practical skills of making strategic decisions in marketing management and development of the enterprise market. The main tasks which should be solved in the process of teaching is the theoretical training of students and the formation of skills in the sphere of strategic marketing management.

### *2.2. Disciplines chosen by the student*

#### *2.2.1. Cycle of professional and practical training\**

##### *Production oriented disciplines*

#### **Master program “Administrative management and marketing in the system of agribusiness”**

**Management consulting.** The system of professional training aims to provide essential knowledge and skills on the organization of management consulting and Advisory services, as well as organization of consulting activity of managers, managers of agroservice. In result of study of discipline future specialist receives knowledge of the basic principles and functions of counselling; communication processes in information and consultancy service; the most effective methods of information dissemination; modern information technologies.

**Introduction to scientific work.** The course acquaints of the students with the basic methods and techniques of scientific research. Students learn to use scientific approaches to its future operations, research necessary for their work processes and phenomena.

**International economic activity of Ukraine.** The purpose of teaching is formation of future managers of the system of special knowledge on the problems and prospects of development of international economic relations for the fundamental and special education

## MASTER DEGREE PROGRAMS

and practical work on speciality. The result of study of discipline is formation of a holistic understanding of the processes that characterize the level of international cooperation of national economies and the formation of students' skills and abilities of the use of acquired knowledge for independent analysis of global processes.

**Management of foreign economic activities.** The aim of teaching the discipline is formation at students of managerial thinking, system of knowledge and acquire practical skills in management of foreign economic activity (FEA). The results of the study is to develop in students a system of thinking about the process of management of foreign trade activities; obtaining practical skills of application of diverse instrumentation and control technology for consideration of specific situations in the field of foreign trade.

---

**UKRAINIAN EDUCATION AND RESEARCH INSTITUTE  
OF INFORMATION AND TELECOMMUNICATION SUPPORT OF AGROINDUSTRIAL  
AND ENVIRONMENT PROTECTIA BRANCHES OF ECONOMY**

**Director** – Ph.D. in computer science, associate professor, Oleksii Tkachenko  
**Tel.:** (044) 527-87-25  
**E-mail:** it\_nni\_director@twin.nauu.kiev.ua  
**Location:** Educational building 15, room 221

**FACULTY OF COMPUTER SCIENCE AND ECONOMIC CYBERNETICS**

**Dean** – Ph.D. in Pedagogics, associate professor, Olena Glazunova  
**Tel.:** (044) 527-83-51  
**E-mail:** o-glazunova@nubip.edu.ua  
**Location:** Educational building 15, room 212

**Faculty training master students in the specialties:**

***8.03050201 “Economic Cybernetics”***

**Department in charge of training graduates:**

**Economic Cybernetics**

**Tel.:** (044) 527-85-67

**E-mail:** ciber\_chair@twin.nauu.kiev.ua

**Head of department** – Ds.Sc. in Economics, professor, Andrii Skrypnyk

***8.05010101 “Information Managing Systems and Technologies”***

**Department in charge of training graduates:**

**Programming Technologies**

**Tel.:** (044) 527-87-23

**E-mail:** iusprog@nubip.edu.ua

**Head of department** – Ds.Sc. in information technologies, professor, Andrii Shelestov

**Computer Networks and Telecommunications**

**Tel.:** (044) 527-81-99

**E-mail:** kmt\_chair@ukr.net

**Head of department** – Ds.Sc. in telecommunications, professor, Valerii Koval

---

**Master Training  
in specialty “ECONOMIC CYBERNETICS”  
Branch of knowledge “Economics and business”**

**Form of training, licensed number of students:**

– full-time

25

**Term of study**

1 year

**Credits**

60 ECTS

**Language of teaching**

Ukrainian

**Qualification of graduates**

Master in economic cybernetics

**The concept of training**

Master in economic cybernetics should have knowledge in economics, analysis and economic systems behaviour research, the theory and practice of decision-making, market development modelling, management, marketing, economic and legal relations. The course is based on a knowledge from the special mathematical disciplines, theoretical and professional knowledge of modern information technologies and use of computer technology in the economy. The knowledge learned on the course make possible to develop systems of models for socio-economic studying phenomena on practice and for research purposes, to create and use static and dynamic expert systems for business processes in agriculture.

**Production oriented master program**

***Master program “Economic and mathematical modelling”***

Specialist of the Master's program in "Economic and mathematical modelling" should have a high level of basic knowledge in economics and scientific research, know and understand the basic principles of agricultural policy. Based on the transformation processes taking place in modern society and the concept of agriculture economic development in the world of information, it is highly important to train analytical and algorithmic thinking, to be able to build mathematical models and apply optimization techniques in the study of real problems in Ukrainian Agricultural Economy. The fundamental in preparation of master student in this program is to accumulate knowledge and skills in mathematical modelling of industrial and management strategies of consumers' behaviour in a competitive economy and learning areas of modelling coordination processes in investing activities of economic systems.

**Sphere of graduates employment**

Masters in "Economic and mathematical modelling" can work on the positions: head of small enterprise, head of analytic centre which processes economic, financial and accounting information, head of departments of information technologies, administrators of computer networks, administrator of tasks systems and databases, analysis of computer system, etc.

**Research oriented master program**

***Master program “Forecasting of social and economic processes”***

This master program provides: knowledge and methodological principals of social and economic processes modelling and forecasting, different variation of dynamics, structure and relation models and conditions of their adaptation to the specific modelling objects. It helps to learn advanced methods of analysis patterns, of massive socio-

economic phenomena formation analysis and prediction of their development in the face of uncertainty.

The knowledge received during study on this master program will allow Masters in Economic Cybernetics successfully conduct research on theoretical and applied problems of economy forecasting.

### Sphere of graduates employment

Masters in “Forecasting of social and economic processes” are detected in the world as analysts of different fields of activity, experts in the field of prediction and simulation of economic processes. Therefore they can be employed as: head of research centre of economic, financial and accounting information processing, head of information technology department, administrator of tasks and systems, database administrator, computer systems analyst etc.

### Practical training

Aimed at the mastering of basic methods of: scientific problem formation, evaluation of necessary information data sets, conducting of analytical, optimization and forecasting developments based on information technology and estimation of economic effects of their implementation in practice and research.

### Proposed Topics for Master Theses

1. Ecological-economic component of the innovative agrochemical components using in this southern Ukraine.
2. Credit risk modelling in agricultural sector.
3. Analysis and prediction of grain production by using control systems, databases and regression models.
4. Modelling of economic processes through synergistic approaches.
5. Investment portfolio of the consumer structure simulation and optimization.
6. Banking simulation and optimization in terms of inflation.
7. Financial condition of the company economic modelling.
8. Key indicators of socio-economic development: methodology and methods of forecasting.

### Academic rights of applicants for a master program

Besides the specialty “Economic Cybernetics” Applicants with a bachelor's degree in “Economic Cybernetics” can continue specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

### Curriculum for specialist training of the educational and qualification level “Master” in specialty “Economics Cybernetics”

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
1	Financial Management	1	108	2,0	3,0
2	Modern Economic Theories	1	108	2,0	3,0
3	Corporate Informational Systems	2	108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
4	Information Projects Management	2	108	2,0	3,0
5	Modelling of Economics Dynamics	1	108	2,0	3,0
6	Modelling of System Characteristics in Economics	2	108	2,0	3,0
7	Mathematical Models of Transformation Economy	1	108	2,0	3,0
Total according to regulatory part			756	14,0	21,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional and practical training*					
1	Computer Networks and Telecommunications	1	90	1,7	2,5
2	Geographical Informational Systems and Technology in Environmental Management	2	90	1,7	2,5
3	Development of WEB-Applets	1	108	2,0	3,0
4	Intelligent Data Analysis	2	90	1,7	2,5
5	Agricultural Consulting	1	72	1,3	2,0
6	Agricultural policy	2	72	1,3	2,0
7	Methodology of Scientific Research	1	72	1,3	2,0
8	Electronic Commerce	2	108	2,0	3,0
9	Business Foreign Language	1	72	1,3	2,0
10	Global Information Resources	2	72	1,3	2,0
11	Standardization and Certification of Information Technology	2	72	1,3	2,0
<i>Total chosen by university</i>			918	17,0	25,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training*					
Production oriented disciplines					
Master program "Economic and mathematical modelling"					
1	System Analysis	1	90	1,7	2,5
2	Modelling and Management of Innovation and Investment Processes	2	72	1,3	2,0
<i>Total selected by the students</i>			162	3,0	4,5
Research oriented disciplines					
Master program "Forecasting of social and economic processes"					
1	Theory of Forecast and Modelling	1	90	1,7	2,5
2	Risk Management	2	72	1,3	2,0
<i>Total selected by the students</i>			162	3,0	4,5
Total number of elected part			1080	20,0	30,0
Practical training			144	2,7	4,0
Writing and defense of master's thesis			180	3,3	4,0
<b>Total for specialty</b>			<b>2160</b>	<b>40,0</b>	<b>60,0</b>

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

**Financial Management.** Essence and methodological bases of financial management. Financial risk management and use of anticrisis management tools on enterprise. Cash flow, profit, investment and assets management. Evaluation of capital price and capital structure optimization.

**Modern Economic Theories.** Methodology of economics and modern models of economic theory. Social and institutional technocratic theories. Theoretical and methodological foundations, structure and basic theories of neo-institutionalism. Concept of economic reforms in post-socialist countries.

**Corporate Informational Systems.** Information Systems of business management. Architecture of IS. HR management and customer relationship. Materials flow



management of corporation. Accounting and reporting in the EIS. Information support of EIS. Telecommunication technologies in the EIS. Implementation of EIS.

**Information Projects Management.** Entry into the project management. Management of the project. Organization of project-oriented activities. Control in project management. Management of the project. Management of the projects' subject area. Time management in the project. Cost Management Project. Quality management in the project. Integrated project management functions. Automation functions of project management.

**Modelling of Economics Dynamics.** Theoretical knowledge and tools of modelling of dynamic economic processes. Principles of modelling of economic processes, linear dynamic processes, equilibrium and disequilibrium, nonlinear dynamic models of economic systems, qualitative methods of analysis of socio-economic processes, stochastic models of economic dynamics, models of economic change, synergistic approach to modelling dynamic systems.

**Modelling of System Characteristics in Economics.** Simulation of system characteristics in the economy. Simulation of planning decisions. Functional characteristics of planning decisions. Modelling of the reliability and strength decisions planning. Simulation and research of inertia planning decisions. Modelling of system performance. Modelling adaptivity development and operations of complex systems. Analysis of the structural properties of the plan. A comprehensive study of elasticity, reliability, maneuverability and flexibility levels of planning decisions.

**Mathematical Models of Transformation Economy.** Basic methods and techniques of crisis management, in a crisis situation, evolutionary and revolutionary theories of economic change and modelling of global economic transformation and crisis management. Types of economic and mathematical models of company' and industry' response on the changing of market conditions.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professional and practical training\*

**Computer Networks and Telecommunications.** Standardization of telecommunications. General concepts of information transfer, modulation and coding techniques in telecommunications. Technology of switching in networks. Digital transmission systems. Classification of networks and their topology. Optimization of telecommunication networks. New trends in information and communication systems.

**Geographical Informational Systems and Technology in Environmental Management.** Geographic information systems and their use. The spatial and attributive information. Introduction mapping and attribute information. The quality of the data. Vector data model. Raster data model. Principles of spatial analysis. Global and local interpolation methods. Analysis of the environment. Analysis of spatial change.

**Development of WEB-Applets.** The concepts complete application creation in the web-environment. Languages HTML, JAVASCRIPT, PHP. Creation of dynamic web-sites. Basic concepts of information and its presentation in a web-environment. The principles of the databases using in a web-environment, the possibility of web-sites creation by using a variety of software tools and their combinations.

**Intelligent Data Analysis.** Introduction into data mining. Methods of data mining. Data mining in databases Microsoft SQL Server. Stages of data mining. Decision tree algorithm. Linear and nonlinear regression models. Cluster analysis. Neural network.

**Agricultural Consulting.** The concept, purpose and objectives of agricultural consulting. History of establishment and development of agricultural advisory in the world and in Ukraine. General questions of rural producers counseling. Mass, group and individual methods of information dissemination, training, consulting and working with

farmers. Using modern information technology in consulting activities. Psychological and ethical aspects of consulting activities.

**Agricultural policy.** The economic essence, nature and main components of agricultural policy, certain measures of financial and credit, tax and price policies in the agricultural sector. Theoretical foundations of agricultural policy and agricultural policy of foreign countries and their blocs. Features of formation and main directions of Agrarian Policy of Ukraine.

**Methodology of Scientific Research.** Methodological principles of research. General methodology of scientific research. Principles of scientific information. General requirements for the design and writing of scientific papers. Master's thesis as a qualification study. General requirements and rules for registration of research. Review, preparation of scientific publications and materials for the protection of the master's thesis.

**Electronic Commerce.** Introduction to e-business. Place of electronic commerce in the information sector. Information Security in e-business. Payment systems in the Internet. Financial systems in the Internet. Marketing in Electronic Commerce. Advertising in the Internet. Submitting of the web-site to directories and Web-site indexing by search engines. Affiliate programs.

**Business Foreign Language.** Vocabulary and grammar of a foreign language necessary for working with foreign literature in order to be able to obtain professional information from foreign sources, and to conduct interviews dialogue. Phonetic rules of a foreign language: 2000 lexical items. Grammatical material.

**Global Information Resources.** Information and copyright. Intellectual property. Internet as a source of scientific information. Finding information on the Internet. Search engines: universal and specialized. Internet space scientific information. Agricultural resources in the web. Resources FAO, network AgroWeb. Finding and presenting data. Presentation of research data.

**Standardization and Certification of Information Technology.** Theoretical and methodological issues of standardization and certification of information technology. General definitions and legal documents that govern this area. Basic concepts and definitions in the field of standardization. Certification in Ukraine. International standards. Standard ISO.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical preparation\**

#### *Production oriented disciplines*

#### **Master program “Economic and mathematical modelling”**

**System Analysis.** Systems analysis as socio-economic systems' research methodology and grounding of management decisions. Subject, method and objectives of the course. Stages of system analysis. The algorithm of the system analysis. Methods of system analysis. Classical methods for social and economic institutions and processes modelling and analysing. Areas of system analysis. Information and Software Systems Analysis.

**Modelling and Management of Innovation and Investment Processes.** Methodology for investments optimization in agricultural production. Economic and mathematic foundations of the investment policy in Ukraine. Simulation and optimization of investment in agricultural production.

#### *Research oriented disciplines*

#### **Master program “Forecasting of social and economic processes”**

**Theory of Forecast and Modelling.** Case modelling and forecasting. Methodological foundations of modelling and prediction. Theoretical framework of

situational opportunistic analysis. Logic of applied modelling. Nature and types of forecasts. Computer technology of modelling and forecasting. Modelling and forecasting. Studies of equilibrium in the economy.

**Risk Management.** The concept of risk and environmental risks. The danger and risk. Types of risk, and risk of danger. Features of environmental risk and environmental management. Risk management of natural resources. The main environmental risks in agriculture on the global level. Risks of land use at the national level. Legislation and practice of rational environmental management: international experience. Environmental Risk Management at the macro level.

---

**Master Training**  
**in specialty “INFORMATION MANAGING SYSTEMS AND TECHNOLOGIES”**  
**Branch of knowledge “Informatics and Computation Technics”**

<b>Form of training, licensed number of students:</b>	
– full-time	<b>25</b>
<b>Term of study</b>	<b>1.5 year</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian</b>
<b>Qualification of graduates</b>	<b>Analyst of computer systems</b>

**The concept of training**

Specialists in this specialty gain knowledge and skills in the following areas: software development, design of data processing systems and their administration. After graduation students has the ability to choose programming techniques relevant to the requirements of specific systems and development tasks in variety of subjects areas; the ability to build effective computational algorithms; the ability to develop integrated information solutions for businesses and enterprises.

Also alumnus possess modern methods of program design and program systems, development of optimal decisions about the software, algorithms, procedures and operations.

**Production oriented master program**

***Master program “Information Managing Systems and Technologies in agro-industrial and environmental field”***

The concept of this master programs direction is in need of training of specialist with skills of designing, building and managing of information systems by using modern technologies of collaborative development, programming, testing, protection and exploitation of managing information systems. Also, master program aimed to train students to use technologies and methods of system analysis and decision-making during creation of large and complex systems using of artificial intelligence systems and software, and computer automated systems.

**Sphere of graduates employment**

On their workplaces graduates can address issues related to the management and maintenance of complex information systems. In addition, they can analyse the problem domain at the system level, design and create database and data warehouses, develop applications and software for the implementation of control systems, computer systems, service applications etc. Graduates of this master's program can work at the positions of: computer systems analyst, computer systems engineer, designer of computer systems, software engineers, databases programmer, applications programmer, systems programmer, database administrator etc.

***Master program “Telecommunication support of information management systems”***

The concept of this master program is in need of training specialists who have system knowledge of methodologies, techniques and tools for creation of modern telecommunication systems and networks – part of information management systems of agricultural and environmental sectors. The knowledge of scenario development, architecture and models of system and circuit design of telecommunication systems, their technical operation and maintenance, the use of computer technologies and software, will allow to future professionals to choose the best technology and tools for the

implementation of schemes for monitoring and control, to organize effective process agricultural and environmental sectors control.

### **Sphere of graduates employment**

Future professionals will be able to work in the IT industry, performing development and maintenance of software, on the positions (in accordance with “State Classifier of Professions”) of: computer systems analyst, computer systems engineer, computer systems designer, software engineer, applied programmer, system programmer, database administrator, system administrator, network administrator and others.

### **Research oriented master program**

#### ***Master program “Distributed Information Systems”***

The new principles of complex software systems creation have been using in recent years, the main role of it is in support of decision making process through the using of mathematical models, processing large amounts of data, providing support for high-performance computing. Concept and overall purpose of this master programme research is in need of professionals with the skills of design, development and implementation of complex information systems using modern technologies, collaborative development, programming, testing, protection and exploitation of managing information systems.

### **Sphere of graduates employment**

The master in “Distributed Information Systems” will be able to work in the IT industry, performing development and maintenance of software, on the positions (in accordance with “State Classifier of Professions”) of: computer systems analyst, computer systems engineer, computer systems designer, software engineer, applied programmer, system programmer, database administrator, system administrator, network administrator, researcher (computer systems), scientist (programming), researcher (field calculations), assistant professor of higher education.

### **Practical training**

Practical training of masters in “Information Control Systems and Technologies” aims to capture general methodological issues of construction and operation of automated data processing, their development and effectiveness, methods and techniques of construction and maintenance of information management systems in application areas and research.

### **Proposed Topics for Master Theses**

1. Corporate knowledge database processing on the example of land cadastre: methods and approaches.
  2. Geospatial biodiversity assessment system based on fuzzy model.
  3. Intelligent classification of crops using satellite data of medium distinction.
  4. Farmer’s distributed information system.
  5. Regression approach in the evaluation of crop acreage.
  6. Agricultural monitoring system based on Google Earth technology.
  7. The monitoring of crops system using the mobile devices.
  8. Information and software decision support system administration in the poultry house.
  9. Information and analysis service of decision support in HR management department on the example of universities and its subdivisions.
  10. Management Information System of agricultural enterprises with artificial intelligence core.
-

**Academic rights of applicants for a master program**

In addition to the specialty “Information Control Systems and Technologies” Applicants with a bachelor diploma in “Computer Science” can continue studying specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Information Control Systems and Technologies”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	The Philosophy of Science and Innovation Development	1	72	1,3	2,0
2	Intellectual Property and Patenting	2	72	1,3	2,0
3	Business Foreign Language	1	72	1,3	2,0
<i>Total number</i>			216	4,0	6,0
<i>1.2. Cycle of mathematic and natural science (fundamental) training*</i>					
1	Economic efficiency of scientific developments	3	108	2,0	3,0
2	Mathematical models in the systems of artificial intelligent	2	108	2,0	3,0
3	The theory of decision making	1	108	2,0	3,0
<i>Total number</i>			324	6,0	9,0
<i>1.3. Cycle of professional training *</i>					
1	Project management	1	108	2,0	3,0
2	Technology of Distributed Systems and Calculation	2	108	2,0	3,0
3	Standardization and Certification of Information Technologies	3	108	2,0	3,0
4	Reliability of Computer Systems Functioning	3	108	2,0	3,0
5	Projecting of Informational-management and intelligence systems	1	108	2,0	3,0
6	Modelling and forecast in environmental sphere	2	108	2,0	3,0
7	Object modelling and designing of complex systems	2	108	2,0	3,0
8	Work Security	2	72	1,3	2,0
<i>Total number</i>			828	15,0	23,0
Total according to regulatory part			1368,0	25,0	38,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
1	Algorithms and Data Structures	2	108	2,0	3,0
2	Calculation Theory	1	108	2,0	3,0
3	Datacentres Organization	1	108	2,0	3,0
4	Intellectual Data Analysis	1	108	2,0	3,0
5	World information Recourses	1	108	2,0	3,0
6	Security of Information and communication systems	2	108	2,0	3,0
7	WEB-applets Development	3	108	2,0	3,0
8	Robot-technic Systems of Management	3	108	2,0	3,0
9	Geographical Informational Systems and Technology in Environmental Management	3	108	2,0	3,0
<i>Total selected by the students</i>			972	18,0	27,0

## MASTER DEGREE PROGRAMS

2.2. Disciplines chosen by students					
Production oriented disciplines					
Master program "Information Managing Systems and Technologies in agro-industrial and environmental field"					
1	Technology of Data Mining	2	108	2,0	3,0
2	Information systems management in APK	2	108	2,0	3,0
3	Frameworks of object-oriented modelling	3	108	2,0	3,0
<i>Total selected by the students</i>			324	6,0	9,0
Master program "Telecommunication support of information management systems"					
1	Global informational infrastructure	2	108	2,0	3,0
2	Telecommunication technology and networks	2	108	2,0	3,0
3	Mobile computer-integrated systems	3	108	2,0	3,0
<i>Total selected by the students</i>			324	6,0	9,0
Research oriented disciplines					
Master program "Distributed Information Systems"					
1	The principles of distributed network programming	2	108	2,0	3,0
2	Methods and information technologies of risks evaluation	2	108	2,0	3,0
3	GRID-Technologies	3	108	2,0	3,0
<i>Total selected by the students</i>			324	6,0	9,0
Total number of elected part			1080	20,0	30,0
Practical training			360	6,7	10,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### Annotations of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### *1.1. Cycle of humanitarian, social and economic training\**

**Philosophy of Science and Innovation Development.** The philosophical and scientific approaches to the study of science and innovation. Forms of science and innovation. Determinant of building classical ideal of science. Methodology of scientific knowledge and innovation. The main scientific forms. Philosophical analysis of the current state of science, the prospects for its development and interaction with other spheres of society. The logic of scientific research in the context of global challenges.

**Intellectual Property and Patenting.** Intellectual property. Copyright. Patent Law. Invention, utility model and industrial design. Registration of patent rights. Legal protection of patent rights. Inside and trade secrets. Legal Protection of Topographies of Integrated Circuits. The legal protection of computer programs and databases. Rights for selection achievements.

**Business Foreign Language.** Orientation in modern information flow to improve foreign language skills. Communication skills and knowledge of English during communicating on professional subjects. Various life situations of business communication in foreign languages, training of future specialists in scientific research, continuing education.

##### *1.2. Cycle of mathematic and natural science (fundamental) training\**

**Economic efficiency of scientific developments.** The concept of equity as a component of modern information. Models and technology development planning. Retrospective and situational simulations in scientific research. Assessment of risk of investing in research and agricultural fields. Predictive modelling in scientific research. Features evaluate the effectiveness of investment research. Tax incentives as a tool of research. Venture funds as a tool of funding research. Features of scientific activities abroad and in Ukraine.

**Mathematical models in the systems of artificial intelligent.** Trends in the development of artificial intelligence and mathematical methods for problems solving of artificial intelligence. Methods of solutions finding for problems of artificial intelligence. Models of knowledge representation. Expert systems in artificial intelligence systems. Tools for creation of artificial intelligence systems. General concepts of integrated programming environment.

**The theory of decision making.** Construction of the decision tree. Methods for multicriteria problems solving. Methods of successive concessions. Dialog methods. Hierarchies and priorities. Definition and sources of uncertainties. Risks in decision making. Problem decision making under uncertainty. Linguistic uncertainty and ambiguity. Displaying fuzzy sets.

### *1.3. Cycle of professional training \**

**Project management.** Project Management System: Objectives, functions, structure of elements. Organization of project management. External organizational structure of the project. Planning the content of the project. Structuring the project. Planning the project in time. Scheduling project. Manage project costs. Control of the project. Methods of control of the project. Risk management project. Management quality of the project. Formation and development of the project team.

**Technology of Distributed Systems and Calculation.** Basic properties of complex distributed software systems. Models of distributed systems. The main architectural components and principles of their interaction. Environment data. Means of network sharing in the modern world. Features modern technologies of complex distributed decentralized systems technologies RMI and COBRA. Basic principles of Web-services.

**Standardization and Certification of Information Technology.** Theoretical and methodological issues of standardization and certification of information technology. General definitions and legal documents that govern this area. Basic concepts and definitions in the field of standardization. Certification in Ukraine. International standards. Standard ISO.

**Reliability of Computer Systems Functioning.** Elements of the theory of reliability. Basic definitions and reliability of their content. Methods of reliability. Reliability and control devices of computer systems. Information redundancy as a universal means of control. Reliability of computational processes.

**Projecting of Informational-management and intelligence systems.** Analysis of data and information flows. Development of computational algorithms. Methodology and technology for development of software for information control and intelligent systems.

**Modelling and forecast in environmental sphere.** The use of simulation in the study and design of complex systems. Classification of mathematical models according to the properties of the processes modelled. The order of development of mathematical models in the field of environmental management. The principle of material balance. Probabilistic models of the application. Linear regression models. Models Monte Carlo. Types and methods of forecasting. Tools for simulation and prediction.

**Object modelling and designing of complex systems.** Object-oriented analysis and design. Presentation of subject areas. Iterative software development technology of complex systems. Fundamentals of object-oriented programming. Domain model. Object Model.

**Work Security.** The concept of civil defense and safety. Knowledge of the organization of professional IT workplace. Terms safe operation of IT infrastructure in the company.



## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

**Algorithms and Data Structures.** The concept of the algorithm. Analysis of algorithms. Recursive functions and algorithms. Search in the array and simple sorting methods. Modifying and rapid methods for sorting. Elementary data structures: linked list, stacks, queues. Hash table. Trees. Counts.

**Calculation Theory.** Algorithmic systems. Formal grammars and formal languages. Regular expressions and languages. The abstract theory of automates. Definition automaton and its variants. Conversion Tables and outputs. Count of transitions and outputs. Finite automata. Shop machines. Versatile software makers.

**Datacentres Organization.** Models database. Query language. Physical storage, access methods and query processing. Transaction management, concurrency control and crash recovery. Security database. Parallel and distributed databases. Data warehousing and data mining. Concepts and Data Model OLAP. The structure of OLAP-cube. Deployment Services Analysis Services. Determination submission of data sources in the project services Analysis Services.

**Intellectual Data Analysis.** Basic concepts. Model complexity. Linear classifier. The problem of linear resolution. The method of support vectors. Gradient methods of teaching the first and the second grade. Gradient methods of teaching first and second grade. Stochastic learning methods. Matrix algorithms for classification. General principles of self-organization of systems. Reducing dimension models. Dynamic classifiers. Optimization models. Fuzzy classifiers. Bayesian solution. Algorithmic composition.

**Global Information Resources.** Information and copyright. Intellectual property. Internet as a source of scientific information. Finding information on the Internet. Search engines: universal and specialized. Internet space scientific information. Agricultural resources in the web. Resources FAO, network AgroWeb. Finding and presenting data. Presentation of research data.

**Security of Information and communication systems.** Problems of corporate information systems security. Key software and hardware for measuring security. Identification and authentication access control in enterprise networks. Screening, security analysis. Logging and auditing. Encryption. Digital certificates. Monitoring integrity. Ensuring availability. Tunnelling and management.

**WEB-applets Development.** Characteristics of Internet services. Roles and responsibilities of clients and servers for various applications in the WWW. Basic protocols necessary for creating and web-work programs, Hypertext Markup Language version 4.01, Cascading Style Sheets version 2.1, the application of internal and external CSS, and browser document model as an example MS IE8, language Java Script: syntactic foundation interaction volume, scripts in external files, the technology of AJAX. Extension Hypertext Markup Language – micro formats. Introduction to language PHP, the skills of designing and programming web applications in PHP.

**Robot-technic Systems of Management.** Purpose, classification and problems of robot control systems. Structure, the basic components of robotic control systems. Intelligent robotic systems. The system of perception and recognition of information. Knowledge management system, problem solving and formation control actions. The system of environmental impact. Principles of robots and robotic systems. System design, manufacturing, robotics control systems. Applications robots and robotic systems in the agro-industrial complex.

**Geographical Informational Systems and Technology in Environmental Management.** Geographic information systems and their use. The spatial and attributive information. Introduction mapping and attribute information. The quality of the data. Vector data model. Raster data model. Principles of spatial analysis. Global and local interpolation methods. Analysis of the environment. Analysis of spatial change.

*2.2. Disciplines chosen by students*

*Production oriented disciplines*

**Master program “Information Managing Systems and Technologies in agro-industrial and environmental field”**

**Technology of Data Mining.** Data Mining Methods for solving classification, regression search associative rules clustering. Use Data Mining the construction of analytical systems.

**Frameworks of object-oriented modeling.** Design patterns that can be implemented in standard object-oriented languages.

**Information systems management in APK.** Using of the Library ITIL, which is developed under a model of quality management information services (Information Technology Service Management – ITSM, IT Service Management). Decisions on management of ICS HP, IBM, Microsoft.

**Master program “Telecommunication support of information management systems”**

**Global informational infrastructure.** The global information society. Fundamentals of global information infrastructure. Characteristics and Technology III. The fundamental building blocks of services III. Models III. Scripts III. The principles of global info communication.

**Telecommunication technology and networks.** Standardization of telecommunications. General concepts of information transfer. Signals Digital information management systems. Modulation and Coding Techniques in telecommunications. Technology multiplexing and synchronization in digital information systems. Digital transmission systems. Synchronous digital hierarchy. Network architecture STSI. Classification of networks and their topology. Network architecture. The concept of network protocol. Synthesis and analysis of telecommunication networks. Optimization of telecommunication networks. New trends in information systems.

**Mobile computer-integrated systems.** Basic principles of zone communication and cellular networks, information systems packet WiFi, WiMax, satellite GPS/D10HACC. Question precision GPS-navigation traffic and other moving objects, automation coordinate binding of these facilities in agricultural areas. Modern principles of system and circuit design of mobile systems technical operation and maintenance of computer technologies and software.

*Research oriented disciplines*

**Master program “Distributed Information Systems”**

**The principles of distributed network programming.** Layered architecture of software systems. Building a modern multicriteria network information systems. Standards and interfaces. Standards OGS. AJAX, language extensions JavaScript, template congestion. Markup WWW-pages. Model DOM. Handling events JavaScript. Structure and properties of CGI-programs. Value Unix-platforms in the creation of modern networked information systems. Language IDL. Model OSI. Component development. Plug-ins.

**Methods and information technologies of risks evaluation.** Definition and classification of risks. Identification and analysis of risks. Methods of risk management. Operational risks. The concept of enterprise risk management.

**GRID-Technologies.** Grid system. Grid Architecture. Basics of operation subsystem Grid systems. Computational Grid system. Grid knowledge. Semantic Web.

---

**EDUCATION AND RESEARCH INSTITUTE  
OF NATURAL SCIENCES AND THE HUMANITIES**

**Director** – Doctor of Chemical Science, Professor, Volodymyr A. Kopilevych  
**Tel.:** (044) 527-84-09, 527-80-50  
**E-mail:** natural\_nni\_director@twin.nauu.kiev.ua  
**Address:** educational building № 2, rooms 12 or 23

**PEDAGOGICAL FACULTY**

**Dean** – Candidate of Technical Science, Associate Professor, Rostyslav A. Tarasenko  
**Tel.:** (044) 527 80 83  
**E-mail:** pedagogy\_dean@twin.nubip.edu.ua  
**Address:** educational building № 15-a, room 237

**Faculty organizes training for Masters in the following specialties:**

**8.01010601 “Social Pedagogy”**

**Chair:**

**The Chair of social education and information technologies in education**

**Tel.:** (044) 527-80-73

**E-mail:** socpedagogy@ukr.net

**Head of the Chair** – Doctor of Science in Pedagogy, Professor Nina T. Tverezovska

**8.18010020 “Management of Educational Institution”**

**Chair:**

**The Chair of training methodology and educational institution management**

**Tel.:** (044) 527-83-56

**E-mail:** methods\_chair@twin.nauu.kiev.ua

**Head of the Chair** – Doctor of Science in Pedagogy, Associate Professor Mykola A. Prygodiy

**8.18010021 “Pedagogy of Higher School”**

**Chair:**

**The Chair of pedagogy**

**Tel:** (044) 527-83-55

**E-mail:** pedagogic@ukr.net

**Head of the Chair** – Candidate of Science in Pedagogy, Associate Professor Andriy A. Kalenskyi

**Master Training  
in specialty “SOCIAL PEDAGOGY”  
Branch of knowledge “Pedagogical Education”**

**Form of training, licensed number of students:**

– full-time 50

– correspondence 50

**Term of study** 1,5/2 year

**Credits** 90 ECTS

**Language of teaching** Ukrainian

**Qualification of graduates** Social teacher

**The concept of training**

Training of a social teacher is determined by state's need for specialists engaged in social and educational assistance, support, protection and rehabilitation of all categories of children and youth. Professional activity of such specialists presupposes the social and educational problems solution as for socialization of children and young people, organizing their social protection, consulting on social and educational issues, organizing their leisure activities, assisting in education to whom it may concern.

**Production oriented master program**

***Master program “Social and educational activity  
in rural areas”***

The need for training social teachers for rural areas is determined by the low level of social development of rural children. This requires strengthening the psychological impact of technology features of social and educational work with rural children and youth, as well as the introduction of modern research in existing rural community. These approaches are implemented in the master's program "Social and educational activity in rural areas".

The mentioned program involves the study of the complex of subjects aiming to organize the professional social and educational work that focuses on social and educational assistance, support, protection and rehabilitation of rural children and youth. Obtained qualification provides graduates with employment in preschool and secondary schools, centers of children education, cultural centers and art schools, social services and educational clubs, children and community organizations; children custody and services for minors; special closed-type institutions for children; governmental centers and social work services, centers of social protection and assistance, employment centers, institutions of preventive education and penitentiary system etc.

**Sphere of graduates employment**

A graduate can work in various functional social organizations of all ownership types, as well as educational, cultural, scientific, consulting organizations and institutions, in subdivisions of state and municipal department on family and youth issues: pensions inspector; researcher (population social protection, social sphere); teacher-methodologist; university lecturer; researcher (in other fields of study); lecturer; teacher of professional educational institution; methodologist; state inspector, supervisor of centers, associations, clubs; director of social services and centers; consultant of specialized services centers; analyst.

## Research oriented master program

### ***Master program “Social and pedagogical monitoring of rural areas and social groups diagnostics”***

The need for training social teachers for social and pedagogical monitoring of rural areas and social groups diagnostics is determined by the life peculiarities in rural communities, its dynamism, certain ambivalence of actions and activities that allows to explore a wide range of issues as “internal” purely age and psychological character as well as “external”- social context of existence of different social groups.

The content of this master's program involves the study, grounds, development, implementation and expertise estimation of relevant tools for social and pedagogical monitoring of social groups. Monitoring provides all participants of the educational process with quality information required, on the one hand, to assess the performed work, and on the other - for management decisions, adjusting the process under study. Social diagnostics allows to define the level of social welfare and social health of rural social environment (micro community). High-quality support for social groups in rural areas provides constant and unbiased monitoring, tracking, identifying and finding solutions to their needs and functioning peculiarities which is necessary for organized scientific research process.

### **Sphere of graduates employment**

A graduate can work in various functional social organizations of all ownership types, as well as educational, cultural, scientific, consulting organizations and institutions, in subdivisions of state and municipal department on family and youth issues: pensions inspector; researcher (social protection, social sphere), teacher-methodologist, university lecturer, researcher (in other fields of study), lecturer, teacher in professional educational institution, methodologist, inspector, supervisor of centers, associations, clubs, director of social services and centers; consultant of specialized services centers, researcher, analyst.

### **Practical training**

Practical training is carried out according to the schedule of educational process directly on authorized practice bases, including: district centers of social services for families, children and youth; departments on work with children on the street; teaching health centers; territorial centers of social services; preschool education; schools of I-III levels; social and psychological rehabilitation centers.

### **Proposed Topics for Master Theses**

1. Features of social and educational work with children with special needs in rural areas.
  2. Features of leisure activity organization with adolescents in rural areas.
  3. Training of rural youth for family life.
  4. Training social teachers for work with rural youth in the social services centers for children, families and youth.
  5. Social and pedagogical conditions of resocialization of juvenile offenders from rural areas in penitentiary system centers.
  6. Features of social and educational work of child rights protection in rural areas.
  7. Features of social and educational centers of social services centers for families, children and youth with orphans and children deprived of parental care in rural areas.
  8. Organizational of forms for social and educational work with risk group children in rural areas.
  9. Organization of leisure activities for teens in recreation zones in rural areas.
-

**MASTER DEGREE PROGRAMS**

10. Features of communicative activities of social teachers in working with rural youth.

**Academic rights of applicants for a master program**

Beside the specialty «Social Pedagogy» undergraduates with Bachelor`s degree in “Social pedagogy” may continue their education in specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Social Pedagogy”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Philosophy of science and innovative development	1	54	1,0	1,5
2	Law-based social and pedagogical activity	1	36	0,7	1,0
3	Rural youth sociology	1	72	1,3	2,0
4	Youth social politics of Ukraine	1	36	0,7	1,0
5	Business foreign language	1	54	1,0	1,5
<i>Total number</i>			252	4,7	7,0
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Social services activity organization	1	108	2,0	3,0
2	Methodological grounds for social and pedagogical research	1	108	2,0	3,0
3	Urgent issues of social pedagogy	1	108	2,0	3,0
4	Social work in Ukraine	1	108	2,0	3,0
5	Social assistance for families	2	108	2,0	3,0
<i>Total number</i>			540	10,0	15,0
<i>1.3. Cycle of professional and practical training *</i>					
1	Psychological and pedagogical therapy	2	126	2,3	3,5
2	Methodology of social and pedagogical subjects teaching	2-3	198	3,7	5,5
3	Demography	2	90	1,7	2,5
4	Social work with children with behavioral problems	2	108	2,0	3,0
5	Pedagogy and psychology of graduate school	1	180	3,3	5,0
6	Management of social and pedagogical systems	2	180	3,3	5,0
7	Professional safety	3	108	2,0	3,0
<i>Total number</i>			990	18,3	27,5
<i>Total according to regulatory part</i>			1782	33,0	49,5
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of professional and practical training *</i>					
1	Methodology of conducting the social and pedagogical training	3	108	2,0	3,0
2	Organization of work with various social groups	3	144	2,7	4,0
Production oriented disciplines					
Master program «Social and pedagogical activity in rural areas»					
1	Speech culture and business communication	2	108	2,0	3,0
2	Information technologies in education	3	180	3,3	5,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
Research oriented disciplines					
Master program «Social and pedagogical monitoring of rural areas and social groups diagnostics»					
1	Expertise of psychological and sociological tools	2	108	2,0	3,0
2	Information technologies in social and pedagogical research	3	180	3,3	5,0
<i>Total chosen by university</i>			540	10,0	15,0
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training *					
1	Management of social and pedagogical activity	3	90	1,7	2,5
Production oriented disciplines					
Master program «Social and pedagogical activity in rural areas»					
1	Advertising and information technologies in social sphere	2	90	1,7	2,5
2	Profession features	3	90	1,7	2,5
<i>Total selected by the students</i>			270	5,0	7,5
Research oriented disciplines					
Master program «Social and pedagogical monitoring of rural areas and social groups diagnostics»					
1	Social groups diagnostics	2	90	1,7	2,5
2	Labour resources and job market	3	90	1,7	2,5
<i>Total selected by the students</i>			270	5,0	7,5
Total number of elected part			810	15,0	22,5
Practical training			242	4,5	7,0
State exam			36	0,7	1,0
Writing and defense of master's thesis			360	6,7	10,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. Cycle of humanitarian, social and economic training\*

**Philosophy of science and innovation.** The main problems of philosophy of science and innovation at the level of its objective development, unbiased contemporary view of the modern science problems.

**Legal framework of social and educational activities.** Characteristics of main legal documents for the implementation of social and pedagogical, theoretical and practical problems of the legal framework of social and educational activities.

**Sociology of rural youth.** The sociology and its components, the study of agricultural, economic and social relations which are carried out by analysis and the study of rural sociology.

**Social youth policy of Ukraine.** Actual problems of the theory and the practice of social youth policy in Ukraine, the structure of social policy, social security, social protection in the social policy, the system of humanitarian policy.

**Business foreign language.** The development of knowledge and skills in reading professional and scientific literature, speaking using the structure "manager-subordinate", "subordinate-manager", annotation and text summarization.

#### 1.2. Cycle of natural science (fundamental) training\*

**Organization of human services.** The issues of social protection of youth, support, educational theory of principles, contents, methods, ways and means for social work and social services.

**Methodological principles of social and educational research.** Social and pedagogical research, research methods, organization of scientific research, the processing of research results.

**Actual problems of social pedagogy.** The basic social technologies and technologies of social and pedagogical work, the implementation of pedagogical and psychological methods in social and educational work.

**Social work in Ukraine.** The theoretical basis, content and organization of social work, forms and methods of social work with various categories of clients, the ethical principles of behavior and ethics of a social worker.

**Social support for families.** The technology of social support for the family, its goals and objectives, the organization of social support for families of different types.

### *1.3. Cycle of professional and practical training \**

**Psychological and educational therapy.** Psychodiagnostics, correction, counseling and psychotherapy, psychological culture of thinking.

**Methods of teaching social and educational disciplines.** The specific features of the learning process in teaching social and educational disciplines, training and educational sessions.

**Demographics.** The theory and the history of demographics, the methods of analysis of demographic processes and structures, quantitative analysis and measurement of demographic processes and structures, population reproduction, birth rate and reproductive behavior, migration.

**Social work with children at risk.** The current problems of social work with children at risk, methods of work, planning and organization of social pedagogy.

**Pedagogy and psychology of high school.** The main problems of pedagogy and psychology of higher education: characteristics of the educational process, basic of didactics, technology training process, development and socialization, personality psychology of student and the teacher, student groups, psychological and educational patterns of the educational process.

**Management of social and educational systems.** Social and pedagogical features of the management process in education, the style of administration and communication, optimization program of management activities.

**Labour protection in the industry.** The system of legal, social, economic, organizational, technical and medical measures and means to preserve health and human working capacity in the labor process in the social and educational field.

## **2. ELECTIVE ACADEMIC DISCIPLINES**

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training \**

**Methodology of the social and pedagogical training.** The essence of social and pedagogical training, its types and structural elements, preparation and organization of social and pedagogical training.

**Organization of work with different social groups.** The current problems of social and educational work with different social groups, methods, planning and organization of social teacher.

### *Production oriented disciplines*

#### **Master program “Social and educational activities in rural areas “**

**Culture speech and business communication.** The communication as a social phenomenon, the functions of communication, the importance of nonverbal communication

---



in business relationships, shapes and styles of business communication, the requirements of communication.

**Information technologies in education.** The place and role of information technologies in education, the organizational principles of information technologies in education, the construction of information systems and research planning.

*Research oriented disciplines*

**Master program “Socio-pedagogical monitoring and diagnostics of rural social groups”**

**Examination of psychological and sociological tools.** The methods of preparation for the psychological and sociological examination of equipment, analysis, synthesis, evaluation of examination data, the formulation of expert opinion and documentation of expertise, personal and professional commitment to professional carrying out psychological assessment.

**Information technologies in social and educational research.** The place and role of information technologies in social and educational research, the organizational principles of information technologies in research, the construction of information systems and research planning.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training \**

**Management of social and educational work.** The development of modern management thinking and systems of expertise in management of social and educational work, the bases of the system of social and pedagogical institutions, taking adequate management solutions.

*Production oriented disciplines*

**Master program “Social and educational activities in rural areas”**

**Advertising and information technologies in the social sphere.** The specificity of the use of advertising and information technologies in the social sphere, strategy and technology of social worker interaction with media, advertising specificity of social workers and institutions.

**Profession science.** The summary of work to determine the skills, knowledge and professional skills for successful performance of a job or the activity, set of methods and technical means to determine competence.

*Research oriented disciplines*

**Master program “Social and pedagogical monitoring and diagnostics of rural social groups”**

**Diagnosis of social groups.** The aims and objectives of diagnosis of social groups, the means of diagnosis, the features of diagnostic techniques, the processing of the results.

**Labor resources and labor market.** The labor resources and labor productivity, labor market and characteristics of its operation, the impact of working ability and quality of workers in efficiency, the involvement of labor resources in social production, the use of labor resources and working hours of the day.

---

**Master Training**  
**in specialty “MANAGEMENT OF EDUCATIONAL INSTITUTION”**  
**Branch of knowledge «Specific categories»**

**Form of training, licensed number of students:**

– full-time 25

– correspondence –

**Term of study** 1,5 year

**Credits** 90 ECTS

**Language of teaching** Ukrainian

**Qualification of graduates** Manager of the company, enterprise and organization (in the sphere of education and production training)

**The concept of training**

Training of a manager of the company, enterprise and organization (in the sphere of education and production training) is determined by the state’s need for specialists who perform designing and optimization of organization structure of the educational institution; management of its educational and economic activity; control of the set tasks; elaborating the personnel policy of the educational institution and those who study there.

**Production oriented master program**

***Master program “Management activity in comprehensive educational institutions”***

Master program aims to train the future specialist in planning and organization of work in comprehensive educational institution, managing the educational and economic activity of comprehensive educational institution, controlling the set tasks, elaborating the personnel policy of the educational institution and those who study there. Specialist training is carried out in theoretical and practical training conditions aiming to combine classroom work and work at the very place of practice, which favours to graduate’s adaptation to future workplace.

**Sphere of graduates employment**

A graduate with Master degree “Manager of the company, enterprise and organization (in the sphere of education and production training)” may work in comprehensive educational institutions (comprehensive schools) on a position of a headmaster, educational center director, manager of out-of-school establishment.

***Master program “Management activity in technical schools”***

Master program aims to train the future specialist in planning and organization of work in technical schools, managing the educational and economic activity of technical schools, controlling the set tasks, elaborating the personnel policy of the educational institution and those who study there. Specialist training is carried out in theoretical and practical training conditions aiming to combine classroom work and work at the very place of practice, which favours to graduate’s adaptation to future workplace.

**Sphere of graduates employment**

A graduate with Master degree “Manager of the company, enterprise and organization (in the sphere of education and production training)” may work in technical schools on a position of a headmaster of a technical school, the head of (work training

center; training center), the head of (training school, educational center, extension service), the head of training division.

***Master program “Management activity in higher educational institutions of I-II levels of accreditation”***

Master program aims to train the future specialist in planning and organization of work in higher educational institutions of I-II levels of accreditation, managing the educational and economic activity of higher educational institutions of I-II levels of accreditation, controlling the set tasks, elaborating the personnel policy of the educational institution and those who study there. Specialist training is carried out in theoretical and practical training conditions aiming to combine classroom work and work at the very place of practice, which favours to graduate’s adaptation to future workplace.

**Sphere of graduates employment**

A graduate with Master degree “Manager of the company, enterprise and organization (in the sphere of education and production training)” may work in higher educational institutions of I-II levels of accreditation on a position of: the head of higher educational institution; the head of (courses, extension service, training center); the chief of the department, practice base, laboratory; the supervisor of student design engineering bureau.

***Master program «Management activity in higher educational institutions of III-IV levels of accreditation»***

Master program aims to train the future specialist in planning and organization of work in higher educational institutions of III-IV levels of accreditation, managing the educational and economic activity of higher educational institutions of III-IV levels of accreditation, controlling the set tasks, elaborating the personnel policy of the educational institution and those who study there. Specialist training is carried out in theoretical and practical training conditions aiming to combine classroom work and work at the very place of practice, which favours to graduate’s adaptation to future workplace.

**Sphere of graduates employment**

A graduate with Master degree “Manager of the company, enterprise and organization (in the sphere of education and production training)” may work in higher educational institutions of III-IV levels of accreditation on a position of: headmaster (rector, chief) of higher educational institution; the head of (extension service, training center); dean, head of the chair (postgraduate school, internship school, residency training, laboratory); the supervisor of student design engineering bureau.

**Practical training**

Practical training is carried out according to the schedule of educational process directly on authorized practice bases, including comprehensive educational institutions (comprehensive schools), technical schools and higher educational institutions of I-IV levels of accreditation.

**Proposed Topics for Master Theses**

1. Management of technical school using innovative technologies.
  2. Management organization of a technical school.
  3. The content and features of comprehensive schools management.
  4. Company ethics of workers at technical schools.
  5. Ethics formation of technical school manager.
-

**MASTER DEGREE PROGRAMS**

6. Information support for the management of educational process in higher educational institutions of I-II levels accreditation.

7. Quality management of education in higher educational institutions in Norway.

8. System approach to innovation management of research type universities.

9. The content and features of human resources management in technical schools.

10. The system of effective personnel management in comprehensive schools.

**Academic rights of applicants for a master program**

Beside the specialty “Management of Educational institution» undergraduates with Bachelor degree may continue their education in specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”, (see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397).

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Management of Educational institution”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Financial and economic activity management	2	108	2,0	3,0
2	Audit and management activity assessment	1	90	1,7	2,5
3	Management psychology	1	90	1,7	2,5
4	Social and ecological work safety	3	72	1,3	2,0
<i>Total number</i>			360	6,7	10
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Legal framework of educational institution	2	90	1,7	2,5
2	Organizations theory	2	90	1,7	2,5
3	Educational institution management	1	144	2,7	4,0
4	Work content management	2	72	1,3	2,0
<i>Total number</i>			396	7,3	11,0
<i>1.3. Cycle of professional and practical training *</i>					
1	Educational institution manager	2	90	1,7	2,5
2	Educational activity management	3	144	2,7	4,0
3	Labor resources management	2	144	2,7	4,0
4	Information connections management	3	72	1,3	2,0
5	Management techniques	2	108	2,0	3,0
6	Information technologies in education	1	144	2,7	4,0
<i>Total number</i>			702	13,0	19,5
<i>Total according to regulatory part</i>			1458	27,0	40,5
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	216	4,0	6,0
2	Education philosophy	1	90	1,7	2,5
3	Civil protection	1	54	1,0	1,5
<i>Total number</i>			252	5,7	7,0
<i>2.1.2 Cycle of professional and practical training *</i>					
1	Education technologies	2	144	2,7	4,0
2	Professional safety	1	54	1,7	1,5
<b>Master program «Management activity in comprehensive educational institutions»</b>					
1	Work organization at schools	1	54	1,0	1,5

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
2	Civil protection of school staff	3	90	1,7	2,5
Master program «Management activity in technical schools»					
1	Marketing and image activity of educational institution	1	54	1,0	1,5
2	Management sociology	3	90	1,7	2,5
Master program «Management activity in higher educational institutions of I-II levels of accreditation»					
1	Higher education and Bologna process	1	54	1,0	1,5
2	Management sociology	3	90	1,7	2,5
Master program «Management activity in higher educational institutions of III-IV levels of accreditation»					
1	Higher education and Bologna process	1	54	1,0	1,5
2	Intellectual property and law-based activity in agricultural and ecology spheres	3	90	1,7	2,5
<i>Total chosen by university</i>			594,0	10,4	16,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training *					
1	Document management and business communication in educational institution management	2	144	2,7	4,0
Master program «Management activity in comprehensive educational institutions»					
1	Modern program products and internet-technologies in education	1	108	2,0	3,0
2	Psycho and psychophysical training	1	108	2,0	3,0
Master program «Management activity in technical schools»					
1	Conflictology	1	108	2,0	3,0
2	Modern program products and internet-technologies in education	1	108	2,0	3,0
Master program «Management activity in higher educational institutions of I-II levels of accreditation»					
1	Conflictology	1	108	2,0	3,0
2	Personnel management	1	108	2,0	3,0
Master program «Management activity in higher educational institutions of III-IV levels of accreditation»					
1	Modern program products and internet-technologies in education	1	108	2,0	3,0
2	Modern education models	1	108	2,0	3,0
<i>Total selected by the students</i>			252,0	4,7	7,0
Total number of elected part			846,0	15,7	23,5
Practical training			576	10,7	16,0
Writing and defense of master's thesis			360	6,7	10,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. Cycle of humanitarian, social and economic training\*

**Financial and economic activity management.** Estimates of the establishment, evaluation criteria for decision making, technology of decisions management on financial, economic, business issues of educational institution.

**Audit and management activity assessment.** Systems for monitoring and evaluating the effectiveness of methods and results of organizations management (companies, institutions) of different ownership types.

**Management psychology.** The main problems of concepts, general principles, structure, functions, methodology, current trends of management psychology.

**Social and ecological work safety.** The essence of social and environmental security activities, and professional capacity of civil defense troops campus and facilities management, psychological and psycho-physiological training.

*1.2. Cycle of natural science (fundamental) training\**

**Legal framework of educational institution.** The constituent documents of the institution, state registration and state regulation of educational institution activity, types and procedures of legal liability, the system of education regulations, laws and regulations of safety management and civil protection.

**Organizations theory.** The general theory of the system of education, organizational plan, methods and tools for information modeling management processes and systems, building effective organizations.

**Educational institution management.** Criteria for evaluation of personnel, evaluation and monitoring of the implementation tasks of the institution, organizational activities, work plans for future, types and activities of educational institution, educational institution development strategy.

**Work content management.** The essence of the theoretical and methodological, social and economic criteria of work content management in school, the theoretical knowledge and practical skills formation in relation to the management of maintenance work including all its constituents.

*1.3. Cycle of professional and practical training \**

**Educational institution manager.** Organizational principles of the educational institution manager, administration services, management of disciplinary relationships, institution control techniques.

**Educational activity management.** Formation of enrollment for deductions and updates on training, organization of educational process in educational institution, educational activities plans, decision-making procedures and criteria for assessing the quality and effectiveness of the educational process in the institution.

**Labor resources management.** The control system of labor potential, formation of quality employment potential, motivation of labor potential management.

**Information connections management.** Requirements for communication, information transfer technology, methods and tools for the collection, recovery, distribution and storage of information, access to information (documents) and uses of technical and organizational information security measures regime and state institutions, the organization of collective work with documents.

**Management techniques.** Forms and methods of constructing the organizational culture working people in the management process, promotion of humanistic management purposes.

**Information technologies in education.** The place and the role of information technologies in education, organizing training and education, organizational principles of information technologies in research, construction and planning of information systems for research.

## **2. ELECTIVE ACADEMIC DISCIPLINES**

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of humanitarian, social and economic training\**

**Business foreign language.** Formation of knowledge and skills in reading professional and scientific literature, conducting conversations in the "manager-subordinate" mode, "subordinate -manager" mode, annotation and summarization of texts.

---

**Education philosophy.** Role and place of philosophy of education in the system of philosophical knowledge, understanding of education in a historical context, the national aspects of the philosophy of education in Ukraine.

**Civil protection.** State policy in the field of civil protection in emergencies, emergencies and their consequences, protection in emergencies, prevention of technogenic emergency situations.

*2.1.2. Cycle of professional and practical training \**

**Education technologies.** Theoretical foundations of educational technologies, history of educational process, technology, developmental education, project-based learning, interactive technologies in education, educational technology and development of the creative personality.

**Professional safety.** The system of legal, social, economic, organizational, technical and medical measures and means to preserve health and human performance at work in the socio-educational field.

**Master program “Management activity in comprehensive educational institutions”**

**Work organization at schools.** Scientific principles of school management, control service at school, organizing the technical work, research, compilation and spreading of good teaching experience.

**Civil protection of school staff.** Objectives and the organizational structure of civil protection, classification and essential characteristics of natural and anthropogenic origin, organization and planning of protective measures, the implementation of rescue and other emergency operations in emergency situations.

**Master program “Management activity in technical schools”**

**Marketing and image activity of educational institution.** Marketing management of the institution, the nature and structure of the quality of education, marketing tools in management, monitoring and control.

**Management sociology.** Patterns, tools, forms and methods of targeting social relations, structures and processes in society (organizations) aiming to organize, support, maintain its optimal functioning, development or change.

**Master program “Management activity in higher educational institutions of I-II levels of accreditation”**

**Higher education and Bologna process.** Learning the principles of a united Europe concerning the formation of a common educational and scientific space.

**Management sociology.** Patterns, tools, forms and methods of targeting social relations, structures and processes in society (organizations) aiming to organize, support, maintain its optimal functioning, development or change.

**Master program “Management activity in higher educational institutions of III-IV levels of accreditation”**

**Higher education and Bologna process.** Learning the principles of a united Europe concerning the formation of a common educational and scientific space  
**Intellectual property and law-based activity in agricultural and environmental spheres.** Description of basic legal documents on intellectual property, the theoretical and practical problems of the legal framework in the agricultural and environmental spheres.

*2.2. Disciplines chosen by students*

---

*2.2.1. Cycle of professional and practical training \**  
*Production oriented disciplines*

**Document management and business communication in educational institution management.** Types of documents and requirements for their plan, document management and control of document storage and their use, ethical and psychological peculiarities of business communication, communication and speech etiquette.

**Master program “Management activity in comprehensive educational institutions”**

**Modern program products and internet-technologies in education.** The place and role of modern software and Internet technologies in education, organizational principles using modern software and Internet technologies in education.

**Psycho and psychophysical training.** The essence of mental and psycho-physiological training, its types and structural elements, preparation and organization of training.

**Master program “Management activity in technical schools”**

**Conflictology.** Tolerance formation for people, interaction strategies in conflict situations, basics of conflict prevention, conflict resolution techniques.

**Modern program products and internet-technologies in education.** The place and role of modern software and Internet technologies in education, organizational principles using modern software and Internet technologies in education.

**Master program “Management activity in higher educational institutions of I-II levels of accreditation”**

**Conflictology.** Tolerance formation for people, interaction strategies in conflict situations, basics of conflict prevention, conflict resolution techniques.

**Personnel management.** Theoretical foundations of HR policies, forms and sources of HR, the content and activities of HR manager.

**Master program “Management activity in higher educational institutions of III-IV levels of accreditation”**

**Modern program products and internet-technologies in education.** The place and role of modern software and Internet technologies in education, organizational principles using modern software and Internet technologies in education.

**Modern education models.** The theoretical basis of education models, modeling of educational processes, characteristics of the main education models in Ukraine and abroad.

---



**Master Training  
in specialty “PEDAGOGY OF HIGHER SCHOOL”  
Branch of knowledge “Specific categories”**

**Form of training, licensed number of students:**

– full-time 75

– correspondence 75

**Term of study** 1,5/2 year

**Credits** 90 ECTS

**Language of teaching** Ukrainian

**Qualification of graduates** High School Teacher

**The concept of training**

High School Teacher training is due to the need of our country in the specialists who should be engaged in work on the organization of the educational process, methodical and scientific work in colleges and high schools. Moreover, such professionals should initiate special activities to motivate social development of high school students.

**Production oriented master program**

***Master program “Methods of teaching set of courses in agronomy”***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and means of agronomic training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

**Sphere of graduates employment**

Alumni with accreditation "Master's degree" with qualification "Teacher of high school" can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

***Master program “Methods of teaching set of courses in plant protection”***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and means of plant protection training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

**Sphere of graduates employment**

Alumni with accreditation “Master's degree” with qualification “Teacher of high school” can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

***Master program “Methods of teaching set of courses in ecology”***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and

means of ecology training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

**Sphere of graduates employment**

Alumni with accreditation "Master's degree" with qualification "Teacher of high school" can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

***Master program "Methods of teaching set of courses in land management"***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and means of land management training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

**Sphere of graduates employment**

Alumni with accreditation "Master's degree" with qualification "Teacher of high school" can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

***Master program "Methods of teaching set of courses in Forestry and Landscape Architecture"***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and means of forestry and landscaping architecture training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

**Sphere of graduates employment**

Alumni with accreditation "Master's degree" with qualification "Teacher of high school" can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

***Master program "Methods of teaching set of courses in Enterprise Economics"***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and means of enterprise economics training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

**Sphere of graduates employment**

Alumni with accreditation "Master's degree" with qualification "Teacher of high school" can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

---

***Master program “Methods of teaching set of courses in Accounting and Audit”***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and means of accounting and audit training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

**Sphere of graduates employment**

Alumni with accreditation "Master's degree" with qualification "Teacher of high school" can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

***Master program “Methods of teaching set of courses in Facility Management”***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and means of facility management training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

**Sphere of graduates employment**

Alumni with accreditation "Master's degree" with qualification "Teacher of high school" can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

***Master program “Methods of teaching set of courses in social and educational disciplines”***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and means of social and educational disciplines training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

**Sphere of graduates employment**

Alumni with accreditation "Master's degree" with qualification "Teacher of high school" can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

***Master program “Methods of teaching set of courses in Agricultural Mechanization”***

The master's degree program provides future professionals with mastering set of subjects, studying historical aspects of theory and methodology of training courses development in professional and practical training, rules, principles, forms, methods and means of Agricultural Mechanization training courses and their content management system and assessment of learning effectiveness, improvements, design and content of disciplines modules, theory and methods of practical training, planning and organization of the educational process in high school, the theory and practice of pedagogical education.

---

### **Sphere of graduates employment**

Graduates of EQL "Master's degree" in direction "Teacher of high school" can work as: assistant, teacher at high school education facilities of different accreditation levels such as colleges, high schools, institutes.

#### ***Master program "Teaching methods of disciplines cycle in land management"***

Master's Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of land management, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

### **Sphere of graduates employment**

The graduate of educational and qualification level "Master" with qualification "lecturer of higher educational establishment" can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

#### ***Master program "Teaching methods of disciplines cycle in forestry and park gardening"***

Master's Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of forestry and park gardening, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

### **Sphere of graduates employment**

The graduate of educational and qualification level "Master" with qualification «lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

#### ***Master program "Training methods of disciplines cycle in enterprise economy"***

Master's Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of enterprise economy, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

### **Sphere of graduates employment**

The graduate of educational and qualification level "Master" with qualification «lecturer of higher educational establishment» can work on posts: assistant, lecturer of

---

higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in accounting and audit”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of accounting and audit, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment” can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in management of organisations”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of management of organisations, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level «Master» with qualification «lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in socially-pedagogical disciplines”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of socially-pedagogical disciplines, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

---

***Master program “Teaching methods of disciplines cycle in mechanisation of agriculture”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of mechanisation of agriculture, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods to a cycle in veterinary disciplines”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of veterinary disciplines, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in electrification and automation of agriculture”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of electrification and automation of agriculture, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment” can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes)

---

***Master program “Teaching methods to a cycle in law disciplines”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of law disciplines, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in animal products manufacturing and processing technology”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of animal products manufacturing and processing technology, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in finance”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of finance, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment” can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

---

***Master program “Teaching methods of disciplines cycle in designing machines for agricultural complex”***

Master's Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of designing machines for agricultural complex, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in transport technologies”***

Master's Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of transport technologies, their maintenance, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level «Master» with qualification «lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in wood processing technologies”***

Master's Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of wood processing technologies, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level «Master» with qualification «lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

---



***Master program “Teaching methods of disciplines cycle in information technology”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of information technology, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level «Master» with qualification «lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in food technologies and engineering”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of food technologies and engineering, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in economic cybernetics”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of economic cybernetics, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

**Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

***Master program “Teaching methods of disciplines cycle in philology”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to

---

disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of philology, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

#### **Sphere of graduates employment**

The graduate of educational and qualification level «Master» with qualification «lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

#### ***Master program “Teaching methods of disciplines cycle in building”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of building, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

#### **Sphere of graduates employment**

The graduate of educational and qualification level «Master» with qualification «lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

#### ***Master program “Teaching methods of disciplines cycle in biotechnology”***

Master’s Program provides mastering of a future expert of complex of studying subjects, studying of historical aspects of development of theory and training technique to disciplines of a cycle of professional and practical preparation; laws, principles, forms, methods and means of studying of disciplines of biotechnology, monitoring system and estimation of results of training; improvement, designing and modelling of the maintenance of studying subjects; theory and technique of practical training; planning, organisation of teaching and educational process in higher educational establishments of I-II levels; theory and education practice.

#### **Sphere of graduates employment**

The graduate of educational and qualification level “Master” with qualification “lecturer of higher educational establishment» can work on posts: assistant, lecturer of higher educational establishment in higher educational establishments of different levels of accreditation (technical schools, colleges, higher schools, institutes).

#### **Practical training**

Practical training is carried out according to the schedule of educational process directly on passported bases of practices, among which: higher educational establishment of I-III accreditation levels (technical schools, colleges, higher schools, institutes).

---

### Proposed Topics for Master Theses

1. Teaching technique of discipline «Production technology of poultry products» to the future technologists on processing of animal products.
2. Maintenance and technique of educational work with youth (on an example of State educational establishment «Nizhyn professional agrarian lyceum, Chernigiv region»).
3. Teaching technique of discipline «Economics of enterprise « in Separated subdivision of NULES of Ukraine «Nemishaevo Agricultural College».
4. Realisation of development training in the process of discipline teaching «Price and pricing» in Separated subdivision of NULES of Ukraine «Crimean Agricultural and Industrial College».
5. Theoretically-methodical principles of formation at the future lecturers of readiness for teaching of professional disciplines on speciality «Transport technologies».
6. New information technologies in the process of studying of economical disciplines in Machine-building college of Donbas state machine-building academy.
7. Teaching technique of a subject «Designing of wood products « in Zhytomyr technological college.
8. Application of credit-modular system at discipline studying «Feeding of agricultural animals» to the future students of animal products manufacturing and processing technology in higher educational establishment of I-II accreditation levels.

### Academic rights of applicants for a master program

Beside the specialty “Pedagogics of higher school” undergraduates with Bachelor degree may continue their education in specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427).

### Curriculum for specialist training of the educational and qualification level “Master” in specialty “Pedagogy of Higher School”

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Business foreign language	1	108	2,0	3,0
2	Civil protection	1	54	1,0	1,5
3	Philosophical problems of scientific knowledge	1	108	2,0	3,0
4	Legal basis of scientific and educational activities	1	54	1,0	1,5
<i>Total number</i>			324	6,0	9,0
<i>1.2. Cycle of professional and practical training *</i>					
1	Introduction to speciality	1	54	1,0	1,5
2	Pedagogics	1	198	3,7	5,5
3	Instar and Educational Psychology	1	162	3,0	4,5
4	Basic research in pedagogy	2	162	3,0	4,5
5	History of Pedagogy	1	108	2,0	3,0
6	Basics of pedagogical mastery	2	108	2,0	3,0
7	Theory and methodology of vocational training	2	216	4,0	6,0
8	The organization of educational work in the university	2	162	3,0	4,5
9	Teaching technologies	2	108	2,0	3,0
10	Informational Technologies in education	2	162	3,0	4,5
11	Occupational safety and health in this area	1	54	1,0	1,5
<i>Total number</i>			1494	27,7	41,5

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
Total according to regulatory part			1818	33,7	50,5
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional and practical training *					
1	Ethics of teacher of high school	3	54	1,0	1,5
2	Vocational training in specialty	3	54	1,0	1,5
3	Strategy of sustainable development of nature and society	1	54	1,0	1,5
4	Development of higher education in foreign countries	2	54	1,0	1,5
5	Social Psychology	3	54	1,0	1,5
6	Psychology of Creativity	3	54	1,0	1,5
<i>Total chosen by university</i>			324	6,0	9,0
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training *					
1	Higher Education of Ukraine and the Bologna Process	3	54	1,0	1,5
Production oriented disciplines					
Master program "Methods of teaching courses in agronomy cycle"					
1	Methods of teaching courses in agronomy cycle	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Methods of teaching subjects cycle of Plant Protection"					
1	Methods of teaching subjects cycle of Plant Protection	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Methods of teaching the cycle of environmental sciences"					
1	Methods of teaching the cycle of environmental sciences	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Methods of teaching subjects cycle of fish farming and aquaculture"					
1	Methods of teaching subjects cycle of fish farming and aquaculture	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Methods of teaching subjects cycle of land"					
1	Methods of teaching subjects cycle of land	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Methods of teaching subjects cycle of Forestry and Landscape Architecture"					
1	Methods of teaching subjects cycle of Forestry and Landscape Architecture	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Methods of teaching subjects cycle in economics"					
1	Methods of teaching subjects cycle in economics	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Methods of teaching cycle disciplines of accounting and auditing"					
1	Methods of teaching cycle disciplines of accounting and auditing	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Methods of teaching subjects cycle of management organizations"					
1	Methods of teaching subjects cycle of management organizations	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Methods of teaching cycle of social and educational courses"					
1	Methods of teaching cycle of social and educational courses	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>Master program "Methods of teaching subjects cycle of Agricultural Mechanization"</b>					
1	Methods of teaching subjects cycle of Agricultural Mechanization	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Methods of veterinary training cycle disciplines"</b>					
1	Methods of veterinary training cycle disciplines	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Methods of teaching subjects cycle of electrification and automation of agriculture"</b>					
1	Methods of teaching subjects cycle of electrification and automation of agriculture	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Methods of teaching cycle of legal disciplines"</b>					
1	Methods of teaching cycle of legal disciplines	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Methods of teaching subjects cycle of technology production and processing of livestock products"</b>					
1	Methods of teaching subjects cycle of technology production and processing of livestock products	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Methods of teaching subjects from the cycle of finance"</b>					
1	Methods of teaching subjects from the cycle of finance	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Methods of teaching subjects cycle of machinery designing for agriculture"</b>					
1	Methods of teaching subjects cycle of machinery designing for agriculture	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Methods of teaching subjects cycle of transport technologies"</b>					
1	Methods of teaching subjects cycle of transport technologies	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Methods of teaching subjects cycle of woodworks"</b>					
1	Methods of teaching subjects cycle of woodworks	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Teaching methods of information technology"</b>					
1	Teaching methods subjects cycle on Information Technology	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Teaching methods of Food Technology and Engineering"</b>					
1	Teaching methods of Food Technology and Engineering	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Teaching methods of economic cybernetics"</b>					
1	Teaching methods subjects cycle of economic cybernetics	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Teaching methods of Philology"</b>					
1	Teaching methods of Philology	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Teaching methods of construction"</b>					
1	Teaching methods of construction	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0
<b>Master program "Teaching methods of biotechnology"</b>					
1	Teaching methods of biotechnology	3	234	4,3	6,5
<i>Total selected by the students</i>			288	5,3	8,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
Total number of elected part			612	11,3	17,0
Practical training			414	7,7	11,5
Writing and defense of master's thesis			396	7,3	11,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## **Annotations of disciplines in the curriculum**

### **1. REGULATORY ACADEMIC DISCIPLINES**

#### *1.1. Cycle of humanitarian, social and economic training\**

**Business foreign language.** Formation of knowledge and skills for reading professional and scientific literature, conducting conversations in the «teacher-student», «leader-subordinate», text annotation.

**Civil protection.** State policy in the field of civil protection in rare circumstances, emergencies and their consequences, population protection in emergencies, prevention of man-caused emergency.

**Philosophical problems of scientific knowledge.** Features of scientific knowledge, its structure, level, methodology and research methods, problems science dynamics, historical development, regularities, peculiarities of a modern period.

**Legal basis of scientific and educational activities.** Characteristics of main legal documents for scientific and pedagogical, theoretical and practical problems of the legal framework in teaching)

#### *1.2. Cycle of professional and practical training \**

**Introduction to the course.** Development of main tasks and functions for university educators, requirements for organization of their personality and work.

**Pedagogy.** Theoretical and practical issues of teaching process organization (didactics), nurture and education management (School Organization and Management).

**Developmental and Educational Psychology.** Peculiarities of psychological, personal development at different stages of life, learning and use psychological capacities of teacher, student (students) in training, education, mastery of social experience.

**Basic research in pedagogy.** Pedagogical research methods, organization of scientific research, processing of research results , teaching experiment.

**History of Education.** Development of theory and practice of education, education and training from ancient times to the present, in different historical periods and socio-economic formations.

**Fundamentals of pedagogical excellence.** Professional and educational work content of the university educator, components of his pedagogical skills, conditions and means of forming educational technology, development of pedagogical abilities and skills.

**Theory and methodology of training.** Theoretical and methodological basis of educational process, structure of teaching methods, teaching material selection and structuring, organization of training sessions. Examines theoretical and methodological aspects of educational work in higher education

**The organization of educational work in higher school.** Theoretical and methodological foundations of the educational process, structure of education methods, selection and content of education, organization of educational work in higher school.

**Teaching technology.** The technological approach to education, student-centred educational technology, analysis of leading contemporary educational technology.

**Information technology in education.** The place and role of information technology in training, organizational principles of information technology in research, construction and planning of research.

**Safety in the industry.** The system of legal, social, economic, organizational, technical and medical measures and means to preserve human health and ability at work in education.

## **2. ELECTIVE ACADEMIC DISCIPLINES**

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training \**

**Ethics of higher school teacher.** Historical features of teaching ethical traditions in Ukraine and abroad, ethics and principles of professional academics.

**Recent developments in the field.** Basic theoretical and practical problems of area optimal organization (in basic education) in Ukraine and abroad.

**Strategy of sustainable development of nature and society.** Interdisciplinary and systematic approach to the study of basic problems of interaction between humans and the environment in terms of policies and strategies for sustainable development.

**Development of higher education in foreign countries.** Socio-economic and political factors and trends in higher education abroad, its reformation, systems of higher education in leading developed countries and in Ukraine.

**Social Psychology.** Reveals the social and psychological mechanisms, ways and means to communicate effectively, show features of human group activity, the nature of mental mass phenomena.

**Psychology of creativity.** Problems of structure, diagnosis, psychological support and development of creative abilities and talents of the individual. history of development and major areas of current research psychology of creativity.

### *2.2. Disciplines chosen by students*

#### *2.2.1. Cycle of professional and practical training \**

**Higher Education of Ukraine and the Bologna Process.** Studying of United Europe statements to form common educational and scientific area.

#### *Production oriented disciplines*

##### **Master program “Teaching methods of disciplines cycle in agronomy”**

Teaching methods of disciplines cycle in agronomy. The objectives, content, principles of teaching disciplines of professional and practical training in agronomy, methods, techniques and forms of education, educational planning process.

##### **Master program “Teaching methods of disciplines cycle in plant protection”**

Teaching methods of disciplines cycle in plant protection. The objectives, content, principles of teaching disciplines of professional and practical training in plant protection, methods, techniques and forms of education, educational planning process.

##### **Master program “Teaching methods of disciplines cycle in ecology disciplines”**

Teaching methods of disciplines cycle in ecology disciplines. The objectives, content, principles of teaching disciplines of professional and practical training in ecology disciplines, methods, techniques and forms of education, educational planning process.

##### **Master program “Teaching methods of disciplines cycle in fisheries and aquaculture”**

Teaching methods of disciplines cycle in fisheries and aquaculture. The objectives, content, principles of teaching disciplines of professional and practical training in fisheries and aquaculture, methods, techniques and forms of education, educational planning process.

---

**Master program “Teaching methods of disciplines cycle in land management”**

Teaching methods of disciplines cycle in land management. The objectives, content, principles of teaching disciplines of professional and practical training in land management, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in forestry and park gardening”**

Teaching methods of disciplines cycle in forestry and park gardening. The objectives, content, principles of teaching disciplines of professional and practical training in forestry and park gardening, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in enterprise economy”**

Teaching methods of disciplines cycle in enterprise economy. The objectives, content, principles of teaching disciplines of professional and practical training in enterprise economy, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in accounting and audit”**

Teaching methods of disciplines cycle in accounting and audit. The objectives, content, principles of teaching disciplines of professional and practical training in accounting and audit, methods, techniques and forms of education, educational planning process.

**Master program ”Teaching methods of disciplines cycle in management of organisations”**

Teaching methods of disciplines cycle in management of organisations. The objectives, content, principles of teaching disciplines of professional and practical training in management of organisations, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in socially-pedagogical”**

Teaching methods of disciplines cycle in socially-pedagogical. The objectives, content, principles of teaching disciplines of professional and practical training in socially-pedagogical, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in mechanisation of agriculture”**

Teaching methods of disciplines cycle in mechanisation of agriculture. The objectives, content, principles of teaching disciplines of professional and practical training in mechanisation of agriculture, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in veterinary”**

Teaching methods of disciplines cycle in veterinary. The objectives, content, principles of teaching disciplines of professional and practical training in veterinary, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in electrification and automation of agriculture”**

Teaching methods of disciplines cycle in electrification and automation of agriculture. The objectives, content, principles of teaching disciplines of professional and

---



practical training in electrification and automation of agriculture, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in law”**

Teaching methods of disciplines cycle in law. The objectives, content, principles of teaching disciplines of professional and practical training in law, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in animal products manufacturing and processing technology”**

Teaching methods of disciplines cycle in animal products manufacturing and processing technology. The objectives, content, principles of teaching disciplines of professional and practical training in animal products manufacturing and processing technology, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in finance”**

Teaching methods of disciplines cycle in finance. The objectives, content, principles of teaching disciplines of professional and practical training in finance, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in designing machines for agricultural complex”**

Teaching methods of disciplines cycle in designing machines for agricultural complex. The objectives, content, principles of teaching disciplines of professional and practical training in designing machines for agricultural complex, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in transport technologies”**

Teaching methods of disciplines cycle in transport technologies. The objectives, content, principles of teaching disciplines of professional and practical training in transport technologies, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in wood processing technologies”**

Teaching methods of disciplines cycle in wood processing technologies. The objectives, content, principles of teaching disciplines of professional and practical training in wood processing technologies, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in information technology”**

Teaching methods of disciplines cycle in information technology. The objectives, content, principles of teaching disciplines of professional and practical training in information technology, methods, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in food technologies and engineering”**

Teaching methods of disciplines cycle in food technologies and engineering. The objectives, content, principles of teaching disciplines of professional and practical training in food technologies and engineering, methods, techniques and forms of education, educational planning process.

---

**Master program “Teaching methods of disciplines cycle in economic cybernetics”**

Teaching methods of disciplines cycle in economic cybernetics. The objectives, content, principles of teaching disciplines of professional and practical training in economic cybernetics, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in philology”**

Teaching methods of disciplines cycle in philology. The objectives, content, principles of teaching disciplines of professional and practical training in philology, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in building”**

Teaching methods of disciplines cycle in building. The objectives, content, principles of teaching disciplines of professional and practical training in building, techniques and forms of education, educational planning process.

**Master program “Teaching methods of disciplines cycle in biotechnology”**

Teaching methods of disciplines cycle in biotechnology. The objectives, content, principles of teaching disciplines of professional and practical training in biotechnology, techniques and forms of education, educational planning process

---

**EDUCATION AND RESEARCH INSTITUTE OF POSTDIPLOMA EDUCATION**

**Director** — Maria M. Kulaets, Candidate of Economical Sciences, Associate professor

**Tel.:** (044) 527-87-42, 527-86-53

**E-mail:** sec\_edu\_nni\_director@twin.nauu.kiev.ua

**Location:** Educational building №10, room 219

**FACULTY OF ADVANCED TRAINING AND RETRAINING OF SPECIALISTS IN AGRICULTURE AND ENVIRONMENT PROTECTION**

**Dean** — Tereza D. Mikitsey, Candidate of Economical Sciences, Associate professor

**Tel:** (044) 527-86-53

**E-mail:** t.mykytsei@gmail.com

**Location:** Educational building №10, room 217

**The faculty provides master training in specialty**

**8.15010002 «Public administration»**

**Department in charge of graduate training:** State Management

**Tel.:** (044) 527-86-48

**E-mail:** marina.edc@ukr.net

**Head of the department** — Larysa M. Usachenko, Doctor of State Management Sciences, Professor

---

**Master Training  
in specialty «Public administration »  
Branch of knowledge «State Management»**

**Form of training, licensed number of students:**

- full-time** 25
- correspondence** 50

**Term of study** 12 months (full-time)

**Credits** 22 months (part-time)

**Language of teaching** 69 ECTS

**Qualification of graduates** Ukrainian  
**Master in Public administration**

**The concept of training**

Master training in subject area 1501 “State Management” in specialty “Public Service” is carried out according to educational and professional programs made up on the basis of professional and qualification characteristics of public officers and education standards. Studying provides in-depth knowledge of law, economy, political science, management, social and humanitarian spheres, qualification, as well as analytical and research skill acquirement based on multi-faceted approach to support of acquisition, administrative and consultatory management in Agribusiness Industry of Ukraine. Master's training provides in-depth knowledge of state management, practical public service, service in self-governing authorities, political process management, business English, etc.

**Production oriented master program**

***Master program “Local Self-Governing”***

The program makes it possible to deepen knowledge in problems of foundation and development of local self-governing in Ukraine on the basis of foreign experience studying and correlation of existing system condition with problems and perspectives of local self-governing development. Master's program provides forming precise understanding of political and law systems, as well as of general tendencies and stages of evolution and development perspectives of self-governing in Ukraine, understanding of role and place of self-governing in the system of state management, and deepening the knowledge of elements, system, and principles of self-governing authorities, their tasks and power, guarantees and liabilities, main rules and regulations as well as self-governing development.

**Sphere of graduates employment**

The program provides training specialists for working in self-governing authorities on the level of territorial, rural, township and town councils, rural, township and town heads, civil and elective servants of local self-governing authorities, heads of public utilities and enterprises, civic organization representatives.

***Master program “Regional Management”***

The program is dealt with Master's training in a sphere of state management, in global and regional scope, training of managers of the highest level and system analytics who are able to render scientifically grounded and practically viable decisions on state and municipal levels, on the level of managing large companies and enterprises, aimed to provide stable development of individual region regarding to global processes.

**Sphere of graduates employment**

The program provides training of specialists for working in regional authorities, production of prediction and program documentation concerning economical and social

---

development of regions and single territories, formulation of proposals and projects of regulatory acts on regional policy realization; production of practical recommendations for public authorities and local authorities about the possible variants of perspective territory development.

***Master program “Project Management”***

The program provides students with necessary skills of project management methodology as one of state management methods. Practical importance assimilation of project management technologies into the state management system of Ukraine is caused by such factors as increasing needs of market economy and civil society, the natural effect of which is need in speeding-up making and realization of state-managing decisions. Besides, global competition which caused the necessity of quality increase while simultaneous decrease of cost of state programs. In Master's program special attention is paid to forming knowledge and skills of forecast and planning of project activities, work organization, coordination and regulation of processes of project development and realization in state management.

**Sphere of graduates employment**

The program provides training specialists for priority directions of state innovation activities by making acting analytical, prognostic and expert functions.

***Master program “Legislation”***

The program provides training of qualified specialists in political and state management, parliamentarism and parliamentary activities, who are able to analyze, develop and realize state policy, provide political and law regulation of parliament activities, regulation procedures, take qualified part in supporting legislative processes for public and local authorities, Supreme Council of Ukraine and local councils.

**Sphere of graduates employment**

Master's program is the program of forming human capacity of civil servants in Ukraine, who are able to develop, analyze and realize state policies; creatively and effectively render management functions, favor innovative processes in society.

***Master program “State Regulation of Agroindustrial Complex”***

The program is based on priorities of professional training of skilled staff for realization of goals and tasks of state agricultural policy, policy in agricultural sphere and regarding state food security. Studying provides in-depth knowledge of law, economy, political science, management, social and humanitarian spheres, qualification, as well as analytical and research skill acquirement based on multi-faceted approach to support of acquisition, administrative and consultatory management in Agribusiness Industry of Ukraine.

**Sphere of graduates employment**

The program provides training of specialists for working in departments and offices of Ministry of Agrarian Policy and Food, General department of agroindustrial development of regional state administrations, State inspection of agriculture of Ukraine, State agency of fish farming of Ukraine.

***Master program “Social and Economic Development of Rural Territories and Self-Governing of Local Communities”***

The program is aimed at heads of self-governing authorities and other self-governing organizations in rural areas. The program provides training specialists with

---

knowledge of categories, concepts, mechanisms, legal principles of functioning of rural territories and rural communities.

**Sphere of graduates employment**

Graduands are able to work as heads of village and township councils, in departments and offices of local self-governing authorities.

***Master program “Organizational and Legal Basis of Public Administration in Agriculture”***

The program is dealt with providing special knowledge, abilities and skills in organization and management of legal service activities in agroindustrial complex, legal and staff providing of state management in the sphere, main principles of working with staff of central executive authorities and local state administrations, as well as self-governing authorities.

**Sphere of graduates employment**

Graduands can be given employment in different subjects of farm management in agroindustrial complex, in state executive bodies, self-governing authorities, relevant departments and authorities which provide warranties concerning state agricultural policy realization.

***Master program “Public Administration in Use and Protection of Land Resources”***

This includes training of highly qualified specialists state management concerning land resources, reallocation of land, land protection and control of its use. The program aims at training professionals for the legal activities of the competent authority to ensure the efficient and effective use of land by all entities within the specified land legislation of Ukraine.

**Sphere of graduates employment**

The training provides staffing needs for a system of authorized bodies, who, according to the land legislation, perform organizational and legal actions to ensure the rational use of land resources and its protection. These include, in particular: regional, Kyiv and Sevastopil, city, district, town, township and village councils; the central body of executive power on Environment and Natural Resources; the central body of executive power on land resources; local administrations.

***Master program “Public Administration in Veterinary Medicine”***

The program aims to train professionals in public administration in veterinary medicine. Students study modern methods of governance in the sector, innovative approaches to organizational and administrative activities of preventive measures in veterinary medicine.

**Sphere of graduates employment**

Training and qualification of graduates enables them employment in the central body of executive power on issues of agricultural policy in the field of veterinary medicine, the State Department of Veterinary Medicine of the State Inspection of Veterinary Medicine, its regional bodies and other public institutions of veterinary medicine for the implementation of preventive, diagnostic, therapeutic and other epidemic measures, research and testing measures which provide oversight functions in the field of veterinary medicine.

---

***Master program “Public Administration of Environment Safety and Sustainable Rural Development”***

The concept of this program involves the formation of competencies for public administration in the field of environmental safety of agricultural sphere – protection of people and nature from extraordinary hazards in Agroindustrial Complex, providing health and quality of life, sustainable socio-economic development of environmentally sustainable agricultural natural management, as well as guarantees of disaster and accident prevention.

**Sphere of graduates employment**

Training and qualification of graduates enabling them to employ in the Ministry of Ecology and Natural Resources of Ukraine, as well as in the State Departments of Environmental Protection.

***Master program “State Regulation of Quality, Safety and Standardization of Agricultural Products”***

The program aims to provide specialists with skills and knowledge of innovative character of the government sector, providing modern society demands on production, processing and marketing of high quality, environmentally friendly products for the domestic market and exports, which involves the use of the most advanced modern technology.

**Sphere of graduates employment**

The level of training and qualifications of graduates enables them to work in local authorities and research structures of State User Standard of Ukraine, departments and services of standardization, metrology and certification for businesses and organizations of different branches.

***Master program “State Regulations of Innovations in Agriculture”***

The program focuses on providing state and local government employees with a high level of professionalism and administrative culture that can competently and responsibly perform administrative functions, introduce new technologies, favor innovation processes. The program aims to provide specialized knowledge and skills to manage and control the innovation of state, sectoral and regional levels, as well as directly at the level of enterprises and organizations.

**Sphere of graduates employment**

Graduates are able to work in the administrative apparatus of the central government and regional authorities, enterprises, institutions and organizations, as well as counseling centers, consulting organizations, scientific-technical and production complexes, as well as research and education institutions.

**Proposed Topics for Master Theses**

1. Warranties of bodies of executive power and self-governing authorities concerning assurance of constitutional rights and freedoms of citizens.
  2. Mechanisms of state management of agricultural sector of national economy of Ukraine in the context of food security of population.
  3. Strategic planning of municipality development on the level of village, township and town (under the district jurisdiction) councils, administrative and territorial units and regions.
  4. Mechanisms of state regulation of ecological and economical development of Ukraine.
-

**MASTER DEGREE PROGRAMS**

5. State regulation of international economic activity in terms of integration of Ukraine into the world economy.
6. Organization and legislation aspects of regulation of legislative process in Ukraine.
7. Legislative and normative base of functioning of agricultural and nature-oriented spheres of Ukraine.
8. Ways of providing social effectiveness of activities of local executive authorities and local self-governing authorities.
9. Regional state policy: analysis of ways of its realization in terms of society reforming.
10. Political leadership and state management: analysis of interconnection and interaction.

**Practical training**

The curriculum of Master's training in specialty "Public Service" includes practical training. The purpose of training is to maintain students' theoretical knowledge and to form professional skills, to learn experience of state and local governments, adoption of advanced methods, forms of organization management, gaining experience in social, occupational and management behavior of a team, training needs to systematical supplementation of their knowledge and applying it in practice of civil servant.

Students are trained in the state or local government authorities that sent them to train, including research areas in the chosen theme of master thesis.

**Curriculum for specialist training of the educational and qualification level  
“Master” in specialty “Public administration”**

№п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of professional and practical training* (including equalizing disciplines)</i>					
1	Introduction to the specialty	1	36	0,67	1
2	Economics I	1	36	0,67	1
3	Law	1	36	0,67	1
4	Fundamentals of information technologies	1	36	0,67	1
5	Foreign language	1	72	1,33	2
6	Methodology of system approach and scientific researches	1	54	1	1,5
7	The legal state regulation	1	90	1,67	2,5
8	Economics II	1	90	1,67	2,5
9	State administration	1	108	2	3
10	Civil Service	2	90	1,67	2,5
11	Social and humanitarian policy	3	54	1	1,5
12	Political aspects of state administration	2	54	1	1,5
13	Organization of civil servant activity	2	108	2	3
14	Computer network technology	1	54	1	1,5
15	Business foreign language	2,3	324	6	9
16	Psychology of management	3	54	1	1,5
<i>Total number</i>			1296	24	36
Total according to regulatory part			1296	24	36
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<b>2.1.1. Cycle of Professional and practical training*</b>					
1	Agricultural policy	3	108	2	3
2	Social and economic development of rural territories	2	72	1,33	2



**MASTER DEGREE PROGRAMS**

№n/n	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
3	Innovation activity in agroindustrial complex	1	72	1,33	2
4	Management consulting	1	72	1,33	2
5	Strategy of sustainable development of nature and society	1	54	1	1,5
6	Public policy in corruption management	1	54	1	1,5
<i>Total chosen by university</i>			432	8	12
<b>2.2. Disciplines chosen by students</b>					
<b>2.2.1. Cycle of Professional and practical training*</b>					
<b>Production-oriented disciplines</b>					
<b>Master program "Local Self-Governing"</b>					
1	Local self-governing	3	36	0,67	1
2	Fundamentals of municipal management	3	36	0,67	1
3	State regulation of community territory development	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3
<b>Master program "Regional Management"</b>					
1	Regional Management	3	36	0,67	1
2	State regulation of region development	3	36	0,67	1
3	Regional policy	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3
<b>Master program "Project management"</b>					
1	Project management	3	36	0,67	1
2	Crisis management	3	36	0,67	1
3	Strategy planning	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3
<b>Master program "Legislation"</b>					
1	Legal and institutional system of Ukraine	3	36	0,67	1
2	Fundamentals of parliamentarism	3	36	0,67	1
3	Rule-making in state management	3	36	0,67	1
<i>Totally at the student's choice</i>			108	2	3
<b>Master program "State Regulation of Agroindustrial Complex"</b>					
1	State regulation of plant product market	3	36	0,67	1
2	State regulation of livestock product market	3	36	0,67	1
3	State regulation of agricultural resource market	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3
<b>Master Program "Social and Economic Development of Rural Territories and Self-Governing of Local Communities"</b>					
1	System of self-governing of rural territories	3	36	0,67	1
2	Theories of motivation of population social and labor activity	3	36	0,67	1
3	Social protection of rural authority population	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3
<b>Master program "Organizational and Legal Basis of Public Administration in Agriculture"</b>					
1	Legislative process	3	36	0,67	1
2	Staff assistance of state management	3	36	0,67	1
3	Finance law	3	36	0,67	1
<b>Master program "Public Administration in Use and Protection of Land Resources"</b>					
1	Territory development planning	3	36	0,67	1
2	State and municipal land management	3	36	0,67	1
3	Efficiency and control estimation	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3
<b>Master program "Public administration in veterinary medicine"</b>					
1	Legal activities of veterinary inspection	3	36	0,67	1
2	State veterinary-sanitary inspection	3	36	0,67	1
3	Organization of diagnostic and preventive measures in veterinary medicine	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3

**MASTER DEGREE PROGRAMS**

№п/п	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>Master Program "Public Administration of Environment Safety and Sustainable Rural Development"</b>					
1	Ecological policy	3	36	0,67	1
2	State ecological management	3	36	0,67	1
3	Ecological safety of agricultural sphere	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3
<b>Master program "State Regulation of Quality, Safety and Standardization of Agricultural Products"</b>					
1	Standardization and certification of agricultural and food production	3	36	0,67	1
2	International and regional standardization and certification	3	36	0,67	1
3	Management of agriculture and food production quality	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3
<b>Master program "State regulations of Innovations in Agriculture"</b>					
1	Economics of innovation company	3	36	0,67	1
2	Intellectual property	3	36	0,67	1
3	State Regulations of Innovations	3	36	0,67	1
<i>Total selected by the students</i>			108	2	3
Total number of elected part			540	10	15
Practical training			270	5	7,5
Writing and defense of master's thesis			378	7	10,5
Total for specialty			2484	46	69

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

*1.1. Cycle of professional and practical training \* (including equalizing disciplines)*

**Introduction to the specialty.** Discipline, which forms a common understanding of the basic concepts and terminology needed to understand educational material sciences "State Government", "Civil Service", "Organization of civil servant activity" and other subjects taught during training at Masters. On the basis of theoretical knowledge students should be able to: orient properly in modern techniques and requirements for master individual work, to search and use specific, scientific, educational and reference literature, organize their working time, build their future professional activities and career.

**Economics I.** The aim of the course is to develop and update students' knowledge of general principles of economic development, the basic theory of the market economy, the economic backgrounds of entrepreneurship, macroeconomic problems of economic development from the standpoint of government regulation. The content of the discipline is the assimilation of economic categories, principles and laws of development of economic relations in terms of limited resources.

**Law.** The purpose of the discipline is providing students with deep theoretical knowledge of the basis of industry relations, as well as practical training of high-level civil servants. The content of the discipline is the study of the structure of the legal system of Ukraine, the basic principles of legal regulations of social relations in the political, social, cultural, economic, environmental, information and other fields.

**Fundamentals of information technologies.** The purpose of the course is the effective use of modern information and communication technologies, hardware and applications for solving professional problems in the civil servant professional activity. The priority of the course is to master the practical skills of information retrieval.

**Foreign language.** The purpose of the course is to develop communicative

competence, namely the use of skills, abilities and knowledge of a foreign language (English, German, French) in the process of communication with representatives of other countries on various issues, preparation for participation in international conferences, projects and discussions, as well as presentations, written exchange of business information (formal and informal letters, resumes, different types of research papers and reports), thus contributing comprehensive personal development of students and their socialization in foreign language society).

**Methodology of system approach and scientific researches.** The discipline assumes mastery of modern theoretical concepts of researches and their practical application. The content of the discipline is the assimilation methodology and techniques of scientific researches and their practical application in writing master's thesis.

**The legal state regulation.** The purpose of the course is to give students who are preparing for the civil service, a set of current knowledge and skills required for the profession to ensure the powers of state bodies and provide citizens with public services, to help better understand the nature government, to examine the legislation which governs these bodies and the peculiarities of its practical use. The content of the discipline is the study of the structure of state mechanism in Ukraine, interaction and mutual influence of bodies of state administration and prediction of state mechanism development.

**Economics II.** The purpose of the discipline is to develop knowledge of macroeconomics, which studies the laws of the economy as a whole, in terms of macroeconomic instability, economic growth, balance at the market of goods and services, financial market and the labor market. The content of the course is examination of the process of country's economic development at the macro level, providing macroeconomic equilibrium in different markets, fiscal and monetary items at the level of the economic system.

**State administration.** The task of the discipline is to familiarize students with the principles, functions, methods of management, and the structure of the state apparatus. The course provides training of highly qualified personnel responsible for public service in any executive authority or local government, able to develop, analyze and implement public policy in a particular area of public administration, creatively, efficiently and effectively perform administrative functions, promote innovation process in society.

**Civil Service.** The course aims to teach students how to use constitutional, legislative and regulatory frameworks of public service in the profession of a civil servant, to acquaint students with the development and organization of public service, general principles and status of civil servant with the basic theoretical propositions of personnel policy and public service, introduce the HR technologies and methods of their application in practice, help to form the skills needed for successful complementation of tasks in the system of civil service.

**Social and humanitarian policy.** The academic discipline involves the formation of knowledge and skills in social and humanitarian policy of Ukraine at the present stage, the main problems of social security and social protection, the social consequences of economic decisions and social work with different population groups.

**Politological aspects of state administration.** The aim of the course is to develop an integrated system of logically completed basic knowledge of the political sphere and of man as a social and political being; to create a foundation for acquiring skills related to cultural assimilation and simulation of senior executive behavior sufficient for successful adaptation in public administration, and public sector in general.

**Organization of civil servant activity.** The academic discipline aims to equip students with knowledge and skills necessary for effective performance of job duties by civil servants, providing contemporary knowledge of national and international experience on concepts and systems of civil servants; assimilation of scientific approaches to the organization of work and workplace, the mechanism of civil servant work planning, acquaintance with the requirements and rules of work with official documents, review of

---

written and oral appeals according to the standards of the business Ukrainian language.

**Computer network technology.** Objective of the course is the acquisition of theoretical knowledge and practical skills in the basics of the establishment and operation of computer networks and their application in civil service. The objects of study are the means of modern communication technology and computer networks and methods of using network technologies to manage the economy. The subject content includes basic theoretical and practical aspects of modern communication facilities and computer networks.

**Business foreign language.** The purpose of the course is to teach civil servants communication within the general issues and problems associated with the use of their official duties, to make the communicative-functional approach to language learning, involving elements of traditional and modern methods of foreign language teaching, as well as to develop lexical and grammatical base, all kinds of speech and language activities, and expand vocabulary on the basis of studying of literary, social and political sources.

**Psychology of management.** It includes in-depth studying by future public service professionals of psychological conditions and characteristics of management in order to improve the efficiency and quality of the management system. Content of the discipline is studying cultural, social, psychological and ethno-psychological characteristics of management, principles and techniques of communication, motivation, methods of stimulation, psychological characteristics of decision-making, and methods of working group forming.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professional and practical training\*

**Agricultural policy.** The purpose of the discipline is to master theoretical and methodological backgrounds of formulation and realization of agricultural policy, knowledge of how to evaluate its effectiveness and justify the choice of various measures of state regulation.

**Social and Economic Development of Rural Territories.** The course involves the formation of knowledge of the structure and functioning peculiarities of economic, social and administrative framework of the rural sector of Ukraine and skills of creation of the effective system of socio-economic development of the village at the micro, meso and macro levels, analysis and detection of imbalances, its componentwise base and development of measures to overcome them.

**Innovations.** The aim of the course is to develop a system of knowledge about innovations in agricultural enterprises with their social problems and society in general, disclosure of the nature of innovative entrepreneurship, determining the role of intellectual property as the innovation basis. The content of the discipline is studying organizational feasibility of innovations, creation and forming demands for innovations, as well as methods and components of innovation policy.

**Management consulting.** The academic discipline involves studying of principles and methods of consulting activities, the characteristics of management consulting and research stages of the consultation process to facilitate future civil servants and local government officials to effectively and efficiently carry out their administrative functions.

**Strategy of sustainable development of nature and society.** The course aims to create a system of knowledge on the interaction between man and environment needed for decision making in further professional activities in accordance with the principles of sustainable development. Discipline provides for the formation of knowledge about optimizing and harmonizing the relationship between man and the environment, creating theoretically reasonable efforts to stabilize and improve the environmental situation in the present socio-economic conditions.

**Public policy in corruption management.** The purpose of the discipline is to obtain

---

thorough knowledge of: the major sources of corruption in public relations in general and the economy in particular, identifying the areas of anti-corruption. The discipline provides anti-corruption behavior skills and competencies on modern approaches to the analysis of the causes of corruption, its economic and social consequences and ways to fight with it.

*2.2. Disciplines chosen by students*

*1.2.1. Cycle of professional and practical training*

*Production oriented disciplines*

**Master program “Local Self-Governing”**

**Local self-governing.** The discipline is aimed at acquiring constitutional principles and functions of local government, the study of local government as a specific form of public authority in order to achieve the goals and objectives of the state through the local government considering its political, economic, social, legal, institutional, financial and other aspects, in particular, tasks and powers of the deputies of city, town and village councils, methods of implementation, mechanisms and instruments of regulation of economic development and social improvement of local communities.

**Fundamentals of municipal management.** The discipline provides the formation of necessary knowledge of municipal management for effective training of specialists in Civil Service who work in local governments, municipalities and government agencies, especially giving the future managers an idea of patterns and characteristics of management activities needed to create skills in solving problems related to the management objectives of different nature in the system of local government.

**State regulation of community territory development.** The discipline provides in-depth mastery of development of area planning in the process of systematic state policy, including planning the formation of a common humanitarian field in Ukraine and at the regional level as well as exploring legal basis for planning interaction of governments, administrations, and local authorities of different levels in the development and implementation of regional development policy.

**Master program “Regional Management”**

**Regional Management.** The discipline is connected with acquiring knowledge about the nature and social importance of regional management as democratic decentralization of public authority and one of the foundations of the constitutional system of Ukraine, conceptual, constitutional and legal basis of regional management, and its key institutions: systems of legal, organizational, financial, territorial backgrounds, agencies and officials of regional management, regional security and liability management, its agencies and officials; problems of formation and development of regional government in Ukraine.

**State regulation of region development.** The study is intended to ensure the development of discipline knowledge about the nature, objectives, goals and priorities of regional development, the study of the principles of local budgets, local taxes and fees and directions for their use, as well as the skills of students to assess the state of development of individual regions of the country and abroad, identify problems of regional development and foresee measures of their solving.

**Regional policy.** The purpose of the discipline is to provide students with the fundamentals of the theory and methodology of regional policy, its types, forms, tools, to form ideas about the role of regional policy in the national strategy for socio-economic development, regional policy position in the system of state regulations of territorial development; to master the skills of working with legislation acts governing the regional policy, activities of regional powers, and the ability to identify and analyze the main trends of regional development, assess the socio-economic situation of the region in order to choose priorities and regional development measures.

---

### **Master Program “Project management”**

**Project management.** This discipline is aimed at acquiring knowledge of modern technology project management and their possible application in the process of state management. In particular, the disclosure of the content of technology project management - assessment of the current state of activity (industry, region, direction, enterprises, institutions, organizations, etc.), prediction and selection of alternative ways of development and organization of a project team, interaction of project management, planning, results, evaluating the effectiveness, innovation management, etc.

**Crisis management.** The purpose of the discipline "Crisis Management" is learning of modern technologies of crisis management and their possible applications in management process. Moreover, the disclosure of a content of technology project management - assessment of the current state of activity (industry, region, direction, enterprises, institutions, organizations, etc.), prediction and selection of alternative ways of development and organization of a project team, interaction of project management, planning, results, evaluating the effectiveness, innovation management, etc.

**Strategy planning.** The study of this discipline is aimed at acquiring knowledge about modern technologies of strategy planning and the possibility of their application in management process. In particular, the disclosure content of technology of strategic planning - assessment of the current state and prospects of development (industry, region, direction, enterprises, institutions, organizations, etc.), the choice of alternative ways and forming strategic development programs, interaction of state planning and monitoring of government programs, planning results, evaluation of effectiveness and efficiency, project planning and strategic management, etc.

### **Master program “Legislation”**

**Legal and institutional system of Ukraine.** The purpose of the discipline is to form a basis of knowledge about various aspects of the formation, development and functioning of legal and institutional system of Ukraine; to get systematic theoretical knowledge about the historical aspects of forming, main tendencies and prospects of development of legal and institutional systems of Ukraine.

**Fundamentals of parliamentarism.** The discipline is aimed at creating a holistic view of representative democracy, understanding the characteristics of electoral and party systems, consideration of parliamentary practice in the world and Ukrainian political practice, familiarizing students with general laws of the origin and development of parliaments, their most important characteristics, role in the life of foreign countries and Ukraine, the most important milestones in the development of parliamentarism.

**Rule-making in state management.** The purpose of the discipline is to develop modern theoretical knowledge and skills on the procedures for the adoption of acts by the power, drafting of laws and regulations, to demonstrate students the problems of creating an effective mechanism of legislative activity in local authorities.

### **Master program “State Regulation of Agroindustrial Complex”**

**State regulation of plant product market.** The aim of the course is to develop students' skills on modern approaches to defining the place and role of state regulation of crop production. The subject of the discipline is the process of regulation of agrarian relations in Ukraine.

**State regulation of livestock product market.** The discipline involves the formation of current knowledge of theoretical and methodological backgrounds of public administration and government regulation on agriculture policy, as well as practical abilities and skills on development of proposals for the organization of public administration to resolve agrarian relations. The subject of the discipline is the process of regulation of agrarian relations in Ukraine.

**State regulation of agricultural resource market.** The course aims to form a system

---

of knowledge and skills on modern approaches and the state's role in shaping the market of resources of individual branches of the nationaleconomy. The subject of the discipline is the process of regulation of agrarian relations in Ukraine in the field of agricultural resource markets.

**Master program “Social and Economic Development of Rural Territories and Self-Governing of Local Communities”**

**System of self-governing of rural territories.** The purpose of the course is to deepen knowledge about self-governing of rural areas, as well as identifying the directions of social partnership, expanding opportunities for farmers to manage their local communities and improving the system of local governing.

**Theories of motivation of population social and labor activity.** The beginning discipline involves the formation of students' knowledge of structure and features of the motivational process, and motivation of social and labor activity, as well as practical skills for using motivation mechanism in the process of socio-economic development of rural areas. The subject of the study is a set of theoretical, practical and methodological issues regarding the structure of the motivation process and features of motivating social and labor activity of rural population.

**Social protection of rural authority population.** The course aims to give students in-depth knowledge about the social protection system of the rural population in Ukraine, social benefits, methods of regulating industrial relations in rural communities, the possible ways of protecting vulnerable social groups and consideration of their interests in decision-making about socio-economic development of areas.

**Master program “Organizational and Legal Basis of Public Administration in Agriculture”**

**Legislative process.** The purpose of the course is to find out the theoretical and legal principles of the legislative process and show their practical use in Ukraine. The object of study is the methodology and techniques of legislative activity.

**Staff assistance of state management.** The discipline involves forming of integral understanding of the mechanisms and processes of human resources management in different spheres of social life. The object of study is the formation of social relations, patterns of organization and operation, development of human resources of the state administrative apparatus as initial conditions and an effective factor in the successful implementation of social reforms.

**Finance law.** The aim of the course is to develop the system of in-depth knowledge of mobilization, allocation and use of centralized and decentralized financial resources of the state. The object of study is the social relations in mobilization, allocation and use of centralized and decentralized state financial resources to ensure the performance of their tasks and functions.

**Master program “Public Administration in Use and Protection of Land Resources”**

**Territory development planning.** The objective of the discipline is the study of patterns of land use, as a territorial basis, natural resources and basic means of production, acceleration of productivity growth on the basis of scientific and technological progress and sustainable use of land, labor and financial resources, professional and environmental training of a land surveyor. The content of the discipline is the assimilation of legal, regulatory and methodological support of the territory development planning.

**State and municipal land management.** The purpose of the course is to examine: basic knowledge of the implementation of land policy in the state, the modern legislative support and performance-based approach in the implementation of public land management at the national and regional levels of land resource management, public authorities and executive bodies on the local structure and powers of local self-government development and implementation of effective policies at the national and regional levels, principles of

---

management and territory development planning.

**Efficiency and control estimation.** The discipline provides basic knowledge of: the implementation of land policy in the state, the modern legislative support and performance-based approach in the implementation of public land management at the national and regional levels of land resource management, public authorities and executive bodies on the local structure and powers of local self-government development and implementation of effective policies at the national and regional levels, principles of management and territory development planning.

#### **Master program “Public Administration in Veterinary Medicine”**

**Legal activities of veterinary inspection.** The course aims to learn the basic provisions and contents of legal documents regulating the activities of veterinary inspection, learn how to organize and carry out activities for the treatment and prevention of infectious animal diseases. The content of the course is the assimilation of institutional and legal background of the Veterinary Service, aimed at preventing infectious diseases, carrying out inspection functions and private veterinary practice.

**State veterinary-sanitary inspection.** Students study the basic provisions and maintenance of domestic and international legal instruments that regulate the activity of Veterinary Service during the state veterinary and sanitary examination. The content of the course is the legal basis of the Veterinary Service during the state veterinary and sanitary examination.

**Organization of diagnostic and preventive measures in veterinary medicine.** The purpose of the course is mastering techniques of clinical laboratory diagnostic principles of special diagnostic tests (ultrasound, radiography, endoscopy, molecular diagnostics) and learning how to organize and carry out activities for treatment and prevention of animal diseases. The content of the course is modern methods of diagnostics, organizational and legal background of the Veterinary Service in treatment and prevention of animal diseases.

#### **Master program “Public Administration of Environment Safety and Sustainable Rural Development”**

**Ecological policy.** The discipline deals with the system of ecological concepts, principles, approaches, priorities and activities documented and officially declared (approved), and defining the relationship between society and the state of the environment, generates knowledge and skills of future leaders on the development of environmental policies and systems of production, management of companies, corporations, which demonstrate susceptibility to environmental management priorities.

**State ecological management.** The discipline forms knowledge about: the conscious human impact on the economic and natural objects and processes and people associated with this; the implementation of conscious human information impact on management objects - the environment as a set of natural and social conditions and processes, natural resources involved in economic turnover and those that are not used in the national economy, landscape, territory, protected areas and health in order to obtain the desired results; the main targets of environmental management - healing and stabilization of state environment, lean nature, conservation, restoration of natural potential, reduction of anthropogenic pressure, pollution and formation of ecological security; application of management functions - general, carried out by state legislative, regulatory bodies and authorized (special), which is held by entities that have special powers to environmental management in accordance with applicable law. The discipline also provides development of skills of new mechanisms of understanding modern environmental management, its orientation and subordination to natural mechanisms of biological environment regulation; forming the National Ecological Network; ecologization of general functions of state government (legislative regulation, forecasting, planning,

---



organization, coordination, approval, monitoring, supervision); having National Environmental Partnership; ecologization of socio-economic development, implementing the principles of sustainable development.

**Ecological safety of agricultural sphere.** The discipline is dealt with examination of the development of public relations, system of state-legal, organizational, scientific, technical, economic and social means of regulating of environmentally dangerous anthropogenic activities, modes of nature management, environment protection, prevention of environmental degradation and risks to ecosystems and humans. Radio security examines basic components of health and safety regulations developed under the basic provisions of the Constitution to ensure acceptable levels of exposure to human society and the biosphere in general, creates knowledge of international safety standards for protection against ionizing, radiation and safety of radiation sources, regulations concerning human exposure to artificial and natural sources of radiation and requirements for the protection of human health while radiation, safe operation with ionizing sources and environmental protection. Biosafety studies the main components of biological safety, sources of environmental hazards in Ukraine and in the world, the foundations of public policy and public administration in the field of biosafety and biosafety regulation in Ukraine.

#### **Master program “State Regulation of Quality, Safety and Standardization of Agricultural Products”**

**Standardization and certification of agricultural and food production.** The academic discipline involves the examination of the principles of international and national standards for agricultural products, the requirements of major international, European and national legislation, regulations and normative documents on standardization, certification of agricultural products quality and safety, providing safety and quality of agricultural products, exploring the practice of creating of regulations.

**International and regional standardization and certification.** The discipline involves principles of international standardization, accreditation and conformity assessment of the requirements of major international and European laws, regulations and normative documents on standardization, certification and accreditation of environmental protection in agriculture, quality assurance and food safety, and international and regional organizations for standardization, accreditation and conformity assessment.

**Management of agriculture and food production quality.** The discipline provides a study of the Laws of Ukraine and regulations concerning the quality and safety of agricultural products and foodstuffs, the study of the maximum allowable levels of safety performance by national, European and international regulations for different types of agricultural products, all-Union State Standard ISO 14000 on environmental protection in relation to processing and agricultural enterprises. Assumed mastering practical skills for the development of quality management and food safety for agricultural products at all stages of production according to all-Union State Standard ISO 180 serial number 9000 and based on the principles of Hazard Analysis and Critical Control Points.

#### **Master program “State Regulations of Innovations in Agriculture”**

**Economics of Innovation Company.** The aim of the course is to provide knowledge of the main sections of applied economics, organization and performance of management at the level of primary social production with regard to innovation component; studying the patterns of functioning and development of enterprises in market environment.

**Intellectual property.** The academic discipline includes the main theoretical and methodological principles of regulation of intellectual property in a market economy. The content of the discipline is the assimilation of legal, regulatory and methodological support to disposal of intellectual property rights, income from intellectual property and intellectual

---

property protection.

**State Regulations of Innovations.** The aim of the course is to develop a system of knowledge about innovation policy, methods and instruments of regulation and stimulation of innovative processes, the importance of development of copyrights system, licensing and franchising. The content of the discipline lies in mastering legislative provision which defines the legal, economic and organizational conditions for sci-tech and innovation activities, provides for the regulation of relations between subjects of science, technology and innovations, establish the procedure and conditions for granting support to legal entities that carry out research, technical and innovation work.



**CRIMEAN AGRO-TECHNOLOGICAL UNIVERSITY  
SOUTHERN FILIAL OF NULES OF UKRAINE**

**Director – PhD in Agriculture, Professor Melnikov Mikhail M.  
Tel.: (0652) 22-72-67  
E-mail: rectorat@csau.crimea-ua.com  
Location: educational building №1**

**THE FACULTY OF THE TECHNOLOGY OF MECHANIZATION  
OF PRODUCTION AND PROCESSING OF AGRICULTURAL PRODUCTS**

**Dean – Ph. D., Associate Professor Gerber Yuri B.  
Tel.: (0652) 26-34-89; 26-31-78  
E-mail: tehfac@mail.ru;  
Location: educational building № 2, room 2/314**

**Faculty provides training in the following specialties:**

***8.10010203 “Mechanization of Agriculture”***

**Departments in charge of graduate training:**

**Agricultural machinery  
Tel.: (0652) 26-35-98  
E-mail: men-nauka@mail.ru  
Head of department – Ph.D, Professor Berenshtein Isaac B.**

**Mechanization, energy and technical services**

**Tel.: (0652) 26-38-23  
E-mail: \_kaf.meh @ rambler.ru  
Head of department – Ph,D, Professor Babytsky Leonid F.**

***8.05170102 “Technologies of Fats and Fat Substitutes”***

**Department in charge of graduate training:**

**Technologies and equipment of fats and essential oils  
Tel.: (0652) 26-34-89  
E-mail: tehfac@mail.ru  
Head of department – Ph. D., Professor, Shlyapnikov Volodimir O.**

***8.05170106 “Technologies of Products of Fermentation and Viticulture”***

**Departments in charge of graduate training:**

**Winemaking and fermentative production  
Tel.: (0652) 26-34-12  
E-mail: tehfac@mail.ru  
Head of department – Ph. D., Professor Sholz-Kulikov Evgeny P.**

**AGRONOMY FACULTY**

**Dean – PhD in Agriculture, Associate Professor Melnikov Mikhail M.  
Tel.: (0652) 26-33-46  
E-mail: dec\_agro@mail.ru  
Location: educational building №1, room 221**

**Faculty provides training in the following specialties:**

***8.09010101 “Agronomy”***

---

**Departments in charge of graduate training:**

**Plant, selection, storing and processing of agricultural products**

**Tel.: (0652) 26-35-31**

**Head of department – PhD in Agriculture, Professor Nikolaev Evgeniy V.**

**Agriculture, general and agricultural chemistry**

**Tel.: (0652) 26-33-79**

**Head of department – PhD in Agrisulture, Professor Osenniy Nikolay G.**

***8.09010104 “Fruit and Vegetable Science and Viticulture”***

**Departments in charge of graduate training:**

**Technology of production, storing and processing of fruits**

**Tel.: (0652) 26-33-35**

**Head of department – PhD in Agriculture, Professor Kopylov Vladimir I.**

**Technology of production, storing and processing products of vegetable-growing and standardization**

**Tel.: (0652) 26-33-38**

**Head of department – PhD in Agriculture, Professor Turbin Victor A.**

**Viticulture**

**Tel.: (0652) 26-33-35**

**Head of department – PhD in Agriculture, Professor Dikan Alexander P.**

**LAND MANAGEMENT AND GEODESY FACULTY**

**The dean – PhD in Agriculture, Associate Professor Kraynyuk Nikolay S.**

**Tel.: (0652) 26-38-75**

**E-mail: [dekankms@ukr.net](mailto:dekankms@ukr.net)**

**Location: educational building № 2, room 218, № 4, room 406**

**Faculty provides training in the following specialty:**

***8.08010103 “Land Management and Cadastre”***

**Department in charge of graduate training:**

**Land management and cadastre**

**Tel.: (0652) 56-38-69**

**Head of department – The doctor of geologo-mineralogical sciences, Professor Salomatin Valery N.**

**ECONOMY DEPARTMENT**

**Dean – Doctor of Economic Sciences, Associate Professor Safonova Vera I.**

**Tel.: (0652) 26-34-41**

**E-mail: [econom\\_catu@ukr.net](mailto:econom_catu@ukr.net)**

**Location: education building No 1, room 208**

**Faculty provides training in the following specialties:**

***8.03050401 “Economics of Enterprise”***

**Department in charge of graduate training:**

**Economics and organization of agricultural enterprises**

**Tel.: (0652) 26-37-21**

---

E-mail: [qwerty20003@rambler.ru](mailto:qwerty20003@rambler.ru)

Head of department – Doctor of Economics, professor Lebedev Kostyntin A.

**8.03050901 “Accounting and Auditing”**

Department in charge of graduate training:

Accounting and Audit

Tel.: (0652) 26-37-38

E-mail: [tatyana-lisovaya@ukr.net](mailto:tatyana-lisovaya@ukr.net)

Head of department – Doctor of Economic Sciences, Associate Professor  
Maydanevich Petro M.

**8.03060101 “Management of Organization and administration”**

Department in charge of graduate training:

Management and Law

Tel.: (0652) 26-36-59

E-mail: [econom\\_catu@ukr.net](mailto:econom_catu@ukr.net)

Head of department – Doctor of Sociology, Professor Hrienko Pavel A.

**FACULTY OF VETERINARY MEDICINE**

The dean – Ph.D. of Veterinary Sciences, associate professor Skripnik Victor I.

Tel.: (0652) 26-34-33

E-mail: [vetmedksau@mail.ru](mailto:vetmedksau@mail.ru)

Location: educational building No. 1, room 210

Faculty provides training in the following specialty:

**8.11010101 “Veterinary Medicine” (according to the types)**

Departments in charge of graduate training:

Noncontagious Pathology and Parasitology

Tel.: (0652) 26-36-79

E-mail: [vetmedksau@mail.ru](mailto:vetmedksau@mail.ru)

Head of department – Doctor of Veterinary Sciences, associate professor  
Lukyanova Galina A.

**Anatomy and Physiology of Domestic Animals**

Tel.: (0652) 26-35-32

E-mail: [vetmedksau@mail.ru](mailto:vetmedksau@mail.ru)

Head of department – Doctor of Veterinary Sciences, professor Krishtoforova  
Bessa V.

**Microbiology, Epizootology and Veterinary Sanitary Inspections**

Tel.: (0652) 26-31-42

E-mail: [vetmedksau@mail.ru](mailto:vetmedksau@mail.ru)

Head of department – Doctor of Veterinary Sciences, professor Kovalev Vasily L.

---

**Master Training  
in specialty “MECHANIZATION OF AGRICULTURE”  
Branch of knowledge “Agricultural Technology and Energy Production”**

**Form of training, licensed number of students:**

– full-time 65

– correspondence 65

**Term of study** 1,5 years

**Credits** 90 ECTS

**Language of teaching** Russian

**Qualification of graduates** research engineer of agricultural engineering

**The concept of training**

Getting the complete higher education, special skills and knowledge on the basis of educational qualification “Bachelor”, sufficient to perform professional tasks and responsibilities of innovative character. During the training students receive in-depth knowledge and skills to improve techniques and to solve urgent problems of complex mechanization of agricultural production, efficient use of resources and management of production processes, design of operational and technical regulations subject to the conditions of different organizational forms. The main objective of training is to provide undergraduate theoretical knowledge and practical skills required to address the creation of modern machines and equipment for agriculture, development of concepts of effective use of agricultural machinery, introduction and implementation of proposals for the implementation of energy-saving technologies, and the creation and use of technology for renewable energy, development of information technology in business management, organization of technical services in agricultural production. Undergraduates who graduated in this specialty have extensive knowledge of contemporary issues in agricultural engineering and effective use of modern advances in agricultural engineering, information technology for agricultural enterprises.

**Production oriented master programs**

***Master program “Mechanization of livestock breeding”***

Effectiveness of livestock production in the modern business environment is to use advanced technologies and facilities to serve the livestock farms, creating conditions for the production and implementation of the scheme “from the farm – to the consumer”. The main objective of training is to provide undergraduate theoretical knowledge and practical skills required to solve problems in innovative livestock: technical improvement of forage production, cleaning housing for livestock, air-conditioning, milking and initial processing of milk. A wide variety of specialized machines that are used in farming, requires high qualification of the graduate.

**Sphere of graduates employment**

Graduates of the Master's program for industrial specialization “Mechanization of animal breeding” can work directly as the heads of agricultural industry of livestock operations, major experts on livestock farms and complexes in growing cattle, pigs and poultry, as well as enterprises with storage and processing of animal products.

***Master program “Mechanization of processing and storage of agricultural products”***

The program allows to prepare future professionals for the decision of the urgent problems and innovative operation and improvement of means to ensure quality processing and storage of agricultural products in farms using ecologically safe energy-saving technologies, with a specific crop in Southern Ukraine and the effective use of renewable energy.

The aim of master's works is to increase power, technical and technological level of agricultural production through the development and study of effective technologies and facilities for the processing and storage of agricultural products to providing the highest quality with minimal energy cost.

**Sphere of graduates employment**

Graduates of the magistracy under this program may work managers refineries, plants, divisions, chief specialist in the processing industry of agriculture, engineers, managers of laboratories in these enterprises. Employment possible in agricultural enterprises of different ownership forms, research institutions and NAS NAAS of Ukraine, or academic institutions that specialize in dealing with scientific issues in the field of “Food technology and engineering”.

***Master program “Labor protection in Agriculture”***

According to the Concept of National Security of Ukraine and the State Concept of Education in “Safety of life and human activities” goal is to provide prospective masters of theoretical and practical knowledge to create social, natural and technological security of citizens in a modern state of the environment. During the implementation of this program the principles of system safety in Ukraine are taught, the technical standards and regulations are studied, monitoring their compliance with the state in the production, operation, repair and maintenance service of tractors, combines, farm machinery and equipment. Particular attention is paid to the rules and methods of compiling job descriptions of employees who serve machines and mechanisms; documents issued to units of labor services in Ukraine.

**Sphere of graduates employment**

Graduates of the magistracy under this program can work in government control over working conditions in the fields of economy, inspectors and experts of the services of safety of Ukraine.

***Master program “Mechanization of agriculture in the southern regions of Ukraine”***

Modern technology and various farm equipment of domestic and foreign production requires from managers and specialists ability to conduct reasonable and effective choice of technology and agricultural technology in modern economies. This Master's program is fully consistent with current trends in the development of agriculture and provides opportunity to obtain knowledge and skills in reasoning and calculation efficiency of new technologies and systems of machines, using them effectively.

**Sphere of graduates employment**

Master of mechanization of agriculture can work agribusiness leader, hold the position of chief specialist in management, heads of divisions, and hold office in the district departments of agriculture, the republican line ministries.

---

## Research oriented master program

### ***Master program “Investigation of mechanical tillage”***

The purpose of the master program is to develop the creative thinking of future masters, to prepare them for the development of theoretical assumptions, learning techniques to find new technical solutions based on bionic comparisons, the constructing of mathematical models of biological prototypes, features of systematic approach for the creation of working groups of tillage machines. The scientific basis for developing and improving the design of energy-saving work of tillage tools are consistently taught.

#### **Sphere of graduates employment**

Graduates of the Master's program by definition can work as teachers of educational institutions of II and III levels of accreditation, occupy the positions of scientists of research institutions and NAS NAAS of Ukraine, the research departments of universities or enter postgraduate studies.

### ***Master program “Investigation of mechanization in perennial plantations”***

The program aims at training professionals that develop scientific reasoning and mechanized processes and working parameters of machines to work in horticulture, viticulture and essential oil production. Future professionals must have the knowledge to improve and develop new machines, their design and operational parameters, have experience using scientific research methods.

#### **Sphere of graduates employment**

Graduates of the Master's program by definition can work as teachers of educational institutions of II and III levels of accreditation, occupy the positions of scientists of research institutions and NAS NAAS of Ukraine, the research departments of universities or enter postgraduate studies.

### ***Master program “Investigation of mechanical chemical protection of plants against diseases, pests and weeds”***

Modern methods and machines for chemical protection of plants require scientific workers and engineers- designers' knowledge of the trends of industry development, production of special equipment, their technological and design features, the ability to calculate the parameters of working bodies of sprayers, pollinators, aerosol generators, perform experimental work, methods of analysis and mathematical treatment of the results of research. Master's program meets the requirements of modern trends in technical equipment for chemical plant protection.

#### **Sphere of graduates employment**

Graduates of the Master's program by definition can work as teachers of educational institutions of II and III levels of accreditation, occupy the positions of scientists of research institutions and NAS NAAS of Ukraine, the research departments of universities or enter postgraduate studies.

### ***Master program “Investigation of mechanical harvesting of cereals and industrial crops”***

Promising technologies and mechanization and harvesting crops require from researchers, teachers, engineers, designers knowledge of modern trends of cleaning equipment and its technological and design features, the ability to calculate the parameters of working bodies, experience of experimental research and application of mathematical methods of research results.

---



### **Sphere of graduates employment**

Graduates of the Master's program by definition can work as teachers of educational institutions of II and III levels of accreditation, occupy the positions of scientists of research institutions and NAS NAAS of Ukraine, the research departments of universities or enter postgraduate studies.

### **Practical training**

Provided the following practice areas: engineering, scientific and pedagogical.

Engineering practice focused on learning the basic areas of engineering. During the practical training future specialist get familiar with the duties of the volume and content of the basic activities of management and accountability of employees, workplace organization, forms, reports, documents, issues of accountability of employees.

Research and teaching practice helps the future professionals to get the practical skills of scientific and educational activities, to learn the advanced achievements of science and practice in the field of agricultural engineering, agricultural mechanization, scientific and educational work.

Bases practical training of the graduate students are: agricultural research and production enterprise "Science", LLC "Agrofirm named in the honor of Krupskaya", Teaching and experimental machine-technological station of Agritechnological University, Ukraine, Educational research and production complex of crops Agritechnological University, Ukraine, Educational research and production complex of animal breeding, Agritechnological University, Ukraine.

### **Proposed Topics for Master Theses**

1. Design process of growing crops.
2. Optimization of complex machines for agricultural production.
3. Design processes in animal husbandry.
4. Optimization of complex machines for livestock farms.
5. Design and optimization of machines and special equipment for processing and storage of agricultural products.
6. Development of safety management in agriculture.
7. Justification of the parameters of technical security measures to improve working conditions.
8. Analysis and optimization of processes, operating modes and agricultural machinery for perennial crops.
9. Research processes, operating modes and machines for soil cultivation.
10. Improvement and development of machines for soil cultivation with elements bionic prototypes.

### **Academic rights of applicants for a master program**

In addition to the specialty "Mechanization of Agriculture" Applicants with a bachelor's degree with a specialty "Processes, machines and equipment of agroindustrial production" can continue their studies at magistracy in the **branch of knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
  - 8.18010021 – "Pedagogy of Higher School" (see p. 434);
  - 8.18010018 – Administrative management (see p. 397);
  - 8.18010020 – "Educational Institution Management" (see p. 427).
-

**MASTER DEGREE PROGRAMS**

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “Mechanization of Agriculture”**

№	Discipline, practice	Semester	hours	Number	
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Ecology labor	1	72	1,3	2,0
2	Legislation and Law in agriculture.	1	72	1,3	2,0
3	World agricultural production	1	72	1,3	2,0
4	Stock market	1	72	1,3	2,0
5	Engineering psychology	1	72	1,3	2,0
6	Business foreign language	1	72	1,3	2,0
7	Philosophy of technology	3	72	1,3	2,0
8	Pedagogy	3	72	1,3	2,0
<i>Total number</i>			576	10,6	16,0
<i>1.2. Cycle of professional training*</i>					
1	Civil protection	1	72	1,3	2,0
2	Agricultural reclamation	1	72	1,3	2,0
3	Transport processes in agriculture	1	72	1,3	2,0
4	Theory and technology of restoration of operability machines	1	72	1,3	2,0
5	Reliability of technological systems	1	72	1,3	2,0
6	Engineering management	1	72	1,3	2,0
7	Industrial safety in the branch	1	72	1,3	2,0
8	Theory and technology of the scientific research	2	72	1,3	2,0
9	Modeling of the technological processes and systems	2	72	1,3	2,0
10	Applied and Computer Technology	2	72	1,3	2,0
11	Precision Agriculture	2	72	1,3	2,0
12	Geographic informational systems	2	72	1,3	2,0
13	Power engineering for agriculture	2	72	1,3	2,0
14	The analysis of technological systems	3	72	1,3	2,0
15	Agricultural service and informational providing	3	72	1,3	2,0
<i>Total number</i>			1080	20,0	30,0
Total according to regulatory part			1656	30,6	46,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional training *					
1	Bionic directions of the agricultural machines development	2	72	1,3	2,0
2	Alternative energy sources of the south Ukraine	2	72	1,3	2,0
3	Inventive activity and patenting	2	72	1,3	2,0
4	Mechanical and mathematical methods of research	2	72	1,3	2,0
5	Testing technology of agricultural machines	2	72	1,3	2,0
6	Processing method of experimental datas	2	72	1,3	2,0
<i>Total chosen by university</i>			432	8,0	12,0
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training**					
Production oriented disciplines					
Master program “Mechanization of livestock breeding”					
1	Technological process in the livestock breeding	3	72	1,3	2,0
2	The modern complexes for the livestock breeding	3	72	1,3	2,0
<i>Total selected by the students</i>			144	2,6	4,0
Master program “Mechanization of processing and storage of agricultural products”					

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours		
1	Technological processes of agricultural raw materials	3	72	1,3	2,0
2	Modern systems of machines for agricultural processing industry	3	72	1,3	2,0
<i>Total selected by the students</i>			144	2,6	4,0
Master program "Industrial safety in the agriculture"					
1	The organization of Industry in agriculture	3	72	1,3	2,0
2	The protection of productive procession in agriculture	3	72	1,3	2,0
<i>Total selected by the students</i>			144	2,6	4,0
Master program "Mechanization of agriculture in the southern regions of Ukraine"					
1	Modern technologies in agriculture	3	72	1,3	2,0
2	Modern systems of machines for agriculture of south Ukraine	3	72	1,3	2,0
<i>Total selected by the students</i>			144	2,6	4,0
Research oriented disciplines					
Master program "Research of processes of mechanical tillage"					
1	Scientific basis of energy storage in processes of the soil in the south on Ukraine	3	72	1,3	2,0
2	Improvement of mechanical tillage	3	72	1,3	2,0
<i>Total selected by the students</i>			144	2,6	4,0
Master program "Research of mechanical processes in perennial plantations"					
1	Theoretical bases of growing fruits and grapes	3	72	1,3	2,0
2	Modern systems of machines and equipment for growing and harvesting of perennial plantations	3	72	1,3	2,0
<i>Total selected by the students</i>			144	2,6	4,0
Master program "Research of the mechanical processes of the chemical protection of the plants against diseases, pests and weeds"					
1	Theoretical bases of technological processes in chemical protection of plants from diseases, pests and weeds	3	72	1,3	2,0
2	Modern systems of machines for chemical protection of plants from diseases, pests and weeds	3	72	1,3	2,0
<i>Total selected by the students</i>			144	2,6	4,0
Master program "Research of mechanical harvesting of cereals and industrial crops"					
1	Theoretical bases of harvesting cereals and crops	3	72	1,3	2,0
2	Modern technologies and machines for harvesting cereals and crops	3	72	1,3	2,0
<i>Total selected by the students</i>			144	2,6	4,0
Total number of elected part			576	10,6	16,0
Practical training			432	8,0	12,0
Writing and defense of master's thesis			324	6,0	9,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

*1.1. Cycle of humanitarian, social and economic training\**

**Ecology of the labor.** The acquaintance of the students with the fundamental theses of theoretical ecology, especially the relationship of the biosphere and technosphere, regional to global environmental problems, the problems of resource-

ecological-economic nature, as well as with modern principles and strategies for sustainable development, and by means of harmonization of economic development of society and secure development environment.

**Legislation and Law in agriculture.** Forming of the students knowledge and understanding of the laws of Ukraine, assurance in the effectiveness of law as a means of regulating social relations, raising the general level of education, the formation of legal thinking, the development of legal consciousness and legal culture.

**World agricultural production.** To give systematic and generalized knowledge about agricultural economics of individual countries and regions in the context of global trends in agricultural production and international relations on the basis of systematic knowledge about the relations of production in agriculture of individual countries, key areas of social and economic integration forms of international economic, social and technological cooperation, advanced foreign practices and experiences.

**Stock market.** To give students knowledge exchange activities, fundamentals of futures and options trading. Prepare students for the practical application of knowledge: the basics of futures trading, commodity exchange, the basic theory of futures markets, stock prices pricing concepts, fundamentals of futures and options trading basics stock speculation, price risk, constitute forward contract basis to calculate , to be able to conduct technical analysis of futures prices of various financial calculations.

**Engineering psychology.** Learn to identify the role of humans in the workplace in terms of technological progress and analyze the system “man-machine”. Students must identify the major concepts in engineering psychology subject and tasks of engineering psychology, engineering psychology place in the sciences; major categories of psychology, industrial psychology and cognitive processes, psychological aspects of human activity in the control system; physiological requirements to technical requirements of “man-machine”.

**Business foreign language.** To get the knowledge, skills and abilities that will provide needed ability for professional communication in the areas of professional and academic communication in speech and writing, improvement and further development of foreign language knowledge acquired by the degree program in various kinds of speech activity.

**Philosophy of technology.** To give masters deep theoretical knowledge of the basic principles and forces of the improvement and development of technology, the impact on the improvement engineering development of fundamental science, the impact on improving the technology of applied science, basic motives and principles of agricultural machinery and theoretical training of future masters in the field of analysis and improve the working of tillage equipment, planting and cleaning equipment.

**Pedagogy.** Academic discipline aims to teach masters knowledge of basic principles of the educational process of higher education, basic forms and methods of teaching and learning of students, educational work with young people, methodology and pedagogical methods of experimental research necessary for future specialists. The main attention is paid to the theory of pedagogy of higher education, coverage and pedagogical justification of laws, phenomena and facts of scientific reasoning, and creating self teaching scientific thinking, new approaches in the educational process of analysis and generalization of teaching experience.

### *1.2.Cycle of professional training\**

**Civil protection.** To teach students methods of population and improve the sustainability of agricultural production facilities in case of emergency, the basics of organizing and conducting rescue and other emergency operations while managing accidents, the consequences of natural disasters, prepare students for practical

---

implementation of the civil defense facilities of agricultural production in emergency circumstances as chief of staff of civil defense facility.

**Agricultural land reclamation.** To form the understanding of land reclamation as the primary means for obtaining high and stable yields of crops, regardless of the vagaries of nature, the development of literacy of techniques irrigation and drainage of agricultural land and an understanding that water can bring not only good, but harm to use it badly.

**Transport processes in agriculture.** Acquisition by future masters of Agricultural Mechanization scientific principles of engineering efficient use of theoretical knowledge and skills on the use of transport processes in agriculture, disclosure and methods of developing a set of rules take full advantage of vehicle-specific in the soil and climatic conditions, determine the need for these vehicles to achieve planned outcomes.

**Theory and technology of restoration of operability of machines.** Study of methods and techniques of repair and rehabilitation of agricultural machinery and technological equipment by the most effective way according to existing specifications, getting deep theoretical and practical knowledge to machinery, detection and elimination of failures.

**Reliability of technological systems.** Developing skills of practical knowledge of methods and techniques to ensure the safety of the reliability and operational performance machines for the set time at optimum cost of material and labor resources, study methods and ways to maintain and restore performance and resource agricultural machinery and technological equipment in the most effective way according to existing technical requirements.

**Engineering Management.** Learning content of management process of the engineering and technical service farm, a theoretical and practical knowledge and skills of students in engineering science management of agricultural enterprises of different ownership forms, mastering the theoretical principles of management skills and applying this knowledge in practice in mechanization of agricultural production, the study of organizational management structure and its optimization problems in terms of market relations, mastering techniques of modern management, learning content management process engineering and technical service farms.

**Labor protection in the industry.** Theoretical and practical training of future specialists to the creation and ongoing support of regulatory conditions, prevention of accidents and injuries in agricultural production, preparation for implementation of the principles of the state policy of Ukraine on legal safe working conditions for agricultural enterprises.

**Theory and technology of scientific research.** The development of creative thinking for future masters, to prepare them for the development of theoretical assumptions and experimental studies of rational planning of experiments, with means of measuring values, analysis, synthesis and design of research results.

**Modeling of processes and systems.** Develop the knowledge and skills necessary to formalize and model construction engineering tasks, selection methods and analysis tools of modern software applications for PC, running the operating system Windows, examine methods of management models – solving optimization problems, methods of descriptive models – solving tasks of durability and heat.

**Applied and computer technology.** Master computer systems and software applications that provide a solution to engineering and scientific problems, design of mechanisms and machines, gain knowledge of the principles of operation and information-processing (IYIS) and computing (IEC) for measuring complexes, learn methods of processing experimental data using universal and specialized computer programs to introduce the type and purpose CAD, give knowledge of the principles and techniques of 3D solid modeling tools and machines and methods of engineering analysis of designed structures using specialized software application.

**Precision agriculture.** To introduce students to the general principles and elements of precision agriculture, to teach students consideration of processing technologies of major crops in the system of precision farming using computer programs.

**Geo-Information Systems.** Give future professionals depth theoretical and practical knowledge of the composition and functions of geographic information systems (GIS), to give a deep theoretical and practical knowledge of geographic information systems and technologies they use, reveal the essence of the main laws modeling in GIS environment, provide the necessary knowledge (theoretical and practical) for independent scientific study GIS with regard to the specific characteristics of production date theoretical understanding of the formation and use of GIS in different directions of the economy; develop students' practical skills in the use of GIS.

**Power Supply APC.** The development of students' basic knowledge of the theory, structure and principles of the system power supply APC. If studied this course students should be given deep theoretical and practical knowledge organization principles of electrical and structural agricultural production; know state level and prospects of agricultural supply, the concept of surge in electrical, physical nature of atmospheric overvoltages, the concept of electric contacts of the electric arc The device and operation of high-voltage and air circuit breakers, load switches, disconnectors, separators, and principle of operation of instrumentation, drives switching equipment, construction of fuses, protective equipment and the requirements for it.

**The analysis of technological systems.** The formation of professional values, methodologies and techniques of system justification of decisions relating to duties of engineering services, research methods for optimal control of technological processes under uncertainty, multi-language tasks and methods of forecasting the outcome of the system.

**Agricultural services and information provision.** Acquisition of knowledge and practical skills to support and restore performance and resource agricultural machinery and technological equipment by the most effective way according to existing specifications, deep theoretical and practical knowledge of theoretical, organizational, and economic foundations of technical service companies in agriculture, methods and means of support of agricultural machinery in working condition.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional training\**

**Bionic areas of development of agricultural machinery.** The development of creative thinking of the future professionals, preparing them to develop theoretical assumptions, learning methods to find new technical solutions based on bionic comparisons of constructive mathematical models of biological prototypes features, a systematic approach in creating work of agricultural machines, study the current state of the problem of mechanical action of working groups on agricultural materials and improvement of agricultural machinery, knowledge of the role of bionics in the improvement of existing and creation of new agricultural machinery, the study of the principles of biosystem approach to the creation of new jobs of agricultural machines, mastering the techniques of bionic study parameters and principles of work of agricultural machinery.

**Alternative energy sources in the south of Ukraine.** Theoretical and practical teaching of future specialists in the classification, technology and design, in the theory of designing systems for the use of alternative energy sources, the study of plants to convert solar, wind energy, waste heat milk, manure and air emissions, the study of the theoretical foundations of the workflow settings for converting alternative energy sources (Sun), development of major technological calculations for use in heating systems and energy,

---

development of energy-saving technological foundations of design processes in agriculture using Sun.

**Inventive activity and patenting.** The development of creative thinking of the future masters in invention and patenting of new technical solutions, teaching on the fundamentals of inventive activity and patenting, drafting, design and application for a patent for invention, the basic principles of patent, the main provisions of legal protection of industrial property in Ukraine, the foundation of inventive activity, sequence assembly, design and application for a patent for invention in the State Patent Office of Ukraine.

**Mechanics and mathematical methods of research.** Mastering the latest knowledge in the field of mechanics of materials and structures used in agricultural production. Students must learn to choose the optimal scheme for the calculation of real mechanical structures and assemblies of machines and improved methods of calculating the strength, stiffness, resistance and vibration. Examining issues of mathematical modeling of mechanical objects in agricultural production, modern methods of calculations of strength, stiffness, stability and vibration of machines, components and structures used in agricultural production using computer technology, the use of experimental research stresses and strains in agricultural parts and components of machines and units.

**Test technology of agricultural machinery.** To teach master's degree students engineers with the theoretical knowledge and practical skills in testing of agricultural machinery under field and laboratory conditions, to give an idea of the main tasks facing a test, scientific test content, provide methodological foundations of evaluation machines, information on the different types of tests (factory, departmental , state) stages of a new agricultural techniques and significance testing in the development of agricultural machinery and tools, and explore methods and means of improving the quality of testing.

**Methods of data processing.** To teach future masters how to view and order processing experimental data, dispersion, correlation and regression analysis, synthesis and processing of the results, the acquisition of skills in matching empirical formulas and ratios to find them, to develop skills in computer technology and software for data processing .

*2.2. Disciplines chosen by students*  
*2.2.1. Cycle of professional training\**

*Production oriented disciplines*

**Master program “Mechanization of livestock”**

**Technological processes in animal husbandry.** To get deep theoretical and practical knowledge in the mechanization of keeping animals and birds, aero-and hydrodynamics in systems of microclimate, water and milking, getting the necessary knowledge (theoretical and practical) for independent scientific evidence, taking into account the specific conditions, mechanization of public and animal farming.

**Modern systems of machines for livestock.** The development of knowledge about effective use of technological systems in livestock. To study methods of calculating machines and equipment, depending on your needs, the study of scientific principles of installation and commissioning of equipment, learning the basics of the technological and technical operation of the equipment, study ways and means of resource and energy efficiency in animal husbandry.

**Master program “Mechanization of processing and storage  
of agricultural products”**

**Technological processes in the agricultural processing industry.** Formation of knowledge and skills in solving problems not only in agricultural production, but also its processing into a farm, individual farms and agricultural enterprises.

**Modern systems for agricultural machinery in manufacturing industry.** The study of modern technological equipment of processing farms, manning, equipment production lines for processing different types of agricultural products.

**Master program “Labour protection in Agriculture”**

**The organization of labor protection in agriculture.** The following issues are considered: basic legislation on the protection of labour, public policy on labour safety, guarantees citizens' rights to health and safety, compensation for damages in case of injury to workers and in the case of death, the main provisions of legislation of Ukraine on protection of women, the main provisions of legislation of Ukraine on protection of minors and the disabled, the organization of labor services, its main tasks, duties and rights, funding and promoting health and safety, public health and safety management, government oversight and public control of safety, analysis, forecasting, prevention of accidents and occupational diseases in the workplace.

**Safety of production processes in agriculture.** The purpose of discipline is to give necessary knowledge about individual and collective protection of workers, basic safety precautions when performing mechanized and non-mechanized operations, the repair and maintenance of vehicles, machinery and equipment, electrical installations, provide insight into the causes of fires, their prevention and suppression methods, organization fire prevention in agriculture.

**Master program “Mechanization of agriculture in the southern regions of Ukraine”**

**Modern technologies in agriculture.** The current and future mechanical technology in agriculture are considered: soil cultivation, sowing and planting, caring for plants, chemical plant protection and seed harvesting grass and forage crops, post-harvest handling of the crop.

**Modern systems of machines for agriculture in the south of Ukraine.** Discipline provides knowledge on current and future systems of agricultural machinery and equipment of domestic and foreign production: tillage, planting, chemical plant protection, gathering hay and forage crops, harvest and post-harvest handling techniques and effective use of agricultural machinery.

*Research oriented disciplines*

**Master program “Investigation of mechanical tillage”**

**Scientific basis of energy conservation mechanization tillage in the south of Ukraine.** Formation of knowledge and skills of scientific basis for energy saving, introduction of safety ecological agricultural products, erosion and economically viable technologies in tillage with the future masters.

**Improvement of mechanical tillage.** The study of optimization methods for soil processes, creation of environmentally friendly, erosion and reliable working groups for cultivation.

**Master program “Investigation of mechanization in perennial plantings”**

**Theoretical foundations of growing fruits and grapes.** Discipline gives knowledge on the theoretical calculation of methods of mechanized processes of working machinery for tillage in orchards, vineyards, for planting seedlings to establish trellis, chemical protection and mechanical processing plants, gathering fruits, grapes and essential oil crops.

**Modern systems of machines and equipment for growing and harvesting of perennial plantings.** Main features of modern and advanced machines of domestic and

---



foreign manufacturers to work in orchards, berries, vineyards, plantings of essential oil crops and machinery for their post-harvest processing are studied

**Master program “Investigation of mechanical chemical protection of plants against diseases, pests and weeds”**

**Theoretical foundations of technological processes in chemical protection of plants from diseases, pests and weeds.** Discipline gives knowledge on the theoretical methods of calculation of operating sprayers, pollinators, aerosol generators and other machinery for chemical plant protection.

**Modern systems of machines for chemical protection of plants from diseases, pests and weeds.** The current and future technologies and machinery for plant protection of domestic and foreign production, methods for their effective use are considered.

**Master program “Investigation of mechanical harvesting of cereals and industrial crops”**

**Theoretical foundations of harvesting of cereals and industrial crops.** The basic theoretical questions on the basics of mechanical processes and working methods of calculating the parameters of the harvesters: mowers, reapers, threshers, grain separators.

**Modern technology and machinery in harvesting grain and industrial crops.** The current and future technology and machines of domestic and foreign production, methods of efficiency are considered.

---

**Master Training**  
**in specialty “TECHNOLOGIES OF FATS AND FAT SUBSTITUTES”**  
**Branch of knowledge “Food and agricultural products”**

**Form of training, licensed number of students:**

– full-time	<b>10 students</b>
<b>Term of study</b>	<b>1,5 years</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of teaching</b>	<b>Russian</b>
<b>Qualification of graduates</b>	<b>research engineer with the technology of fats and fat substitutes</b>

**The concept of training**

Masters as a result of training in the specialty “Technologies of Fats and Fat Substitutes” acquire knowledge and skills in the field of food fatty foods and essential oils. Training specialists in this area includes the study of trends in the fats and oils production in Ukraine and abroad; natural sources of getting fat products, raw materials market for fat production, development of basic processes and equipment to prepare material for oil extraction plant oils, the development of technological bases storing oilseeds, study flowsheet and equipment for oil and fat products (vegetable oils and animal fats). The future research engineers study the logistics of production and purification of vegetable oils and animal fats, production of margarine and mayonnaise production and technological bases of technical fats, surfactants, fatty acids, higher fatty alcohols.

**Production oriented master program**

***Master program “Technology of aromatic oil production”***

The master's program is aimed at acquiring knowledge and skills in solving production problems on the production of essential oils. Master in accordance with this program is prepared for production activities in the following areas: the use of technology and equipment for processing of aromatic raw materials, designing and Works Processing aromatic enterprises of different ownership, improvement of technologies essential oil production, development of technical and technological measures and energy-efficient waste processing of the technologies of aromatic raw materials, the development of measures to improve the quality aromatic raw materials, distribution range of essential oil production and increase its competitiveness, organization and implementation of measures to reduce the cost of essential oil products for enterprises of different ownership, development technology and instrumentation solutions of various aromatic products, to improve the recycling technologies of various types of aromatic raw materials, the development of complex, non-waste technologies of the essential oil products with the distribution of range of products, the design of the company to process aromatic raw materials.

***Master program “Technology of fats and fat substitutes”***

The Master program aims at training of specialist of the production orientation, able to work as the head and leading experts in the oil industry enterprises. Master in accordance with this program is prepared for production and planning in the areas of process technology and design of production lines for the production of fat substitutes and essential oils, making and implementation of proposals for optimization of technological processes industry, the introduction of energy-saving technologies, development of quality control measures and safety of products produced by the introduction of technologies for

complex processing of aromatic raw materials, production planning environmental security, development of information technologies in production management.

### **Sphere of graduates employment**

Qualification of magistracy graduates in employment according to the state classifier of professions of Ukraine – “Master of Technology fats and fat substitutes”. According to the obtained qualification magistracy graduates can occupy the following positions: heads of businesses, chief specialist, head of research units and units of scientific and technological preparation of production (for pre-production and design: soap boiling, microbiological departments, perfumes, merchandise, technical guidance, technology, analytical chemical studies), head research units and units of scientific and technological preparation of production (covering sections: research, design, automation of production processes, environmental protection, standardization, technical, technological, central plant laboratory, pilot production, etc.), chief project engineer, chief chemist, head (head) of (research, project), head of department (bureau) design project materials, head of the Laboratory (research, pre-production), Head of the factory Central Laboratory, the head of the research factory department, analytical chemist, chemical engineer, assistant engineer, engineer, design engineer of the mechanized development, engineer of the introduction of new equipment and technology, research engineer, university professor, the teacher of the professional educational institution.

### **Practical training**

Provides the following practice areas: engineering and research-teaching.

Engineering practice focused on learning the basic areas of engineering. During the practical training future specialist familiar with the duties of the volume and content of the basic activities of management and accountability of employees, workplace organization, forms, reports, documents, issues of accountability of employees.

Research and teaching practice contributes to future professionals the practical skills of scientific and educational activities to learn the advanced achievements of science and practice in the field of food fatty foods, essential oils, scientific and educational work.

Enterprises of practice: Institute of Crimean Agriculture, the factory “Əfir”, industrial complex “The Crimean Rose”, Bakhchisarai aromatic Co., Ltd. “Istaroma”.

### **Proposed Topics for Master Theses**

1. Improving of the process of the temperature step and sequential extraction of rose essential oil.
2. The improved processing of the kohobation technology of rose essential oil.
3. Improving of the process of allocating of the absolute oils from concretes.
4. Justification of settings distillation technology in aromatic hydrocarbon mistcella production.
5. Adsorption technology is the selection of essential oil distillation from water.
6. Justification of parameter processing technologies of grain aromatic raw materials compatible with the decomposition process of steam distillation.
7. Improving the technology of dynamic sorption of the floral materials.

### **Academic rights of applicants for a master program**

In addition to the specialty “Technologies of Fats and Fat Substitutes” applicants with a bachelors Diploma in the field of “Food Technology and Engineering” can continue their studies at master in the field of knowledge **0517 “Food and agricultural products”**:

- 8.05170104 – Technologies of Preservation, Conservation and Processing of Meat” (see p. 163);
-

**MASTER DEGREE PROGRAMS**

- 8.05170105 – Technologies of Preservation and Processing of Water Bioresources (see p. 169);

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”, (see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “Technologies of Fats and Fat Substitutes”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Philosophy of science and innovation development	1	72	1,3	2,0
2	Strategy of sustainable development of nature and society	1	72	1,3	2,0
3	Management and Marketing	1	90	1,7	2,5
4	Psychology, education and fundamentals of teaching	1	72	1,3	2,0
<i>Total number</i>			306	5,6	8,5
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Innovative technology of fats and fat substitutes	2,3	162	3,0	4,5
2	Mathematical modeling of computer	2	144	2,7	4,0
3	Environmental problems of industry	3	90	1,7	2,5
<i>Total number</i>			396	7,4	11,0
<i>1.3. Cycle of professional and practical training*</i>					
1	International standardization and certification technologies, raw materials and finished products	1	72	1,3	2,0
2	Civil protection	1	90	1,7	2,5
3	Technology of perfumery-cosmetic production	1	162	3,0	4,5
4	Optimization of technological processes in the production of aromatic	1	126	2,3	3,5
5	Designing of the basics of CAD	1	108	2,0	3,0
6	Fundamentals of industrial construction and plumbing	1	72	1,3	2,0
7	Labour protection of industry	1	72	1,3	2,0
8	Research and practical specialty	2,3	288	5,2	8,0
<i>Total number</i>			990	16,7	27,5
<i>Total according to regulatory part</i>			1692	31,3	47,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional and practical training*</i>					
1	Modern technology of fats and fat substitutes	2,3	108	2,0	3,0
2	Optimization of technological processes in the perfume and cosmetic manufacture	1	90	1,6	2,5
3	Perspective Technologies of industry	2	72	1,3	2,0
4	Exploitation and repair of technological equipment	1	72	1,3	2,0
5	Technological calculations, accounting and reporting of industry	1	72	1,3	2,0

## MASTER DEGREE PROGRAMS

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
6	Reliability of the equipment processing enterprises	1	72	1,3	2,0
7	Renewable Sources of energy in manufacturing industry	2,3	72	1,3	2,0
8	Technological quality of raw materials perfume and cosmetic industries	1	72	1,3	2,0
<i>Total chosen by university</i>			630	11,7	17,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training *					
The Master program "Technology aromatic production"					
1	Methodology of teaching in Universities	2,3	72	1,3	2,0
2	Features of research in aromatic industry	2	90	1,7	2,5
3	Aromatherapy	3	108	2,0	3,0
The Master program "Technology of fats and fat substitutes"					
1	Methodology of teaching in Universities	2,3	72	1,3	2,0
2	Modern Food Science Research	2	90	1,7	2,5
3	Features of the science-researching work in the oil industry	3	108	2,0	3,0
<i>Total selected by the students</i>			270	5,0	7,5
Total number of elected part			900	16,7	25,0
Practical training			486	8,0	12,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### Annotations of disciplines in the curriculum

#### 1. REGULATORY ACADEMIC DISCIPLINES

##### 1.1. Cycle of humanitarian, social and economic training\*

**Philosophy of science and innovation.** The course covers the specifics of the philosophy of science and innovation development as a special type of human knowledge and as an academic discipline is a characteristic of the historical development of major trends and methodological techniques solve the main problems of philosophy of science, the methodological, structural, ideological and value principles and characteristics of scientific knowledge, is the philosophical analysis of the specific current state of world and domestic science, the prospects for their development and interaction with other spheres of society.

**Strategy of sustainable development of nature and society.** Discipline provides the formation of knowledge about optimizing and harmonizing the relationship between man and the environment, creating theoretically reasonable efforts to stabilize and improve the environmental situation in the present socio-economic conditions.

Any human activity affects the environment, and deterioration of the biosphere is dangerous to all living things, including humans. It put forward to preserve the biosphere of our planet. A comprehensive study of existing problems of man's relationship with the environment should provide strategic approaches to address both immediate and prospective planetary problems of people.

**Management and Marketing.** Learning content management process engineering and technical service processing enterprises, a theoretical and practical knowledge and skills of students in the scientific management of engineering enterprises of different ownership forms, mastering the theoretical principles of management and marketing skills and application of knowledge in the practice of specialists in the field: food technology and

engineering, the study of organizational management structure and its optimization problems in terms of market relations, mastering techniques of modern management.

**Psychology, education and the basics of teaching.** Students need to identify the basic concepts of psychology and pedagogy, subject and tasks of psychology and pedagogy, psychology place in the sciences; major categories of psychology, industrial psychology and cognitive processes, psychological aspects of human activity in the control system; physiological requirements to technical requirements of “man-technology-machine”. The main attention is paid to the class conscious assimilation theory pedagogy of higher education, coverage and pedagogical justification of laws, phenomena and facts of scientific reasoning, and creating self teaching scientific thinking, new approaches in the educational process of analysis and generalization of teaching experience.

### *1.2. Cycle of natural science (fundamental) training\**

**Innovative technology of fats and fat substitutes.** In the course of the discipline innovative technology of fats and fat substitutes undergraduates study particular methods of experimentation, systematization, analysis and evaluation of research, design research work, copyright and patent documents in aromatic production. The main areas of study: advanced technology and production equipment perfumes and cosmetics, the basic requirements for their quality and methods of control.

**Mathematical modeling of computer.** Develop in students the knowledge and skills necessary to formalize and model construction engineering tasks, selection methods and analysis tools of modern software applications for PC, running the operating system Windows, examine methods of management models – solving optimization problems, methods of descriptive models – solving problem of strength and of heat and mass transfer.

**Ecological problems of industry.** To familiarize students with the fundamental provisions of theoretical ecology, especially the relationship of the biosphere and technosphere, regional to global environmental problems, the problems of resource and environmental and economic perspective, and with modern principles and strategies for sustainable development, and by means of harmonization of economic development of society and secure development environment.

### *1.3. Cycle of professional and practical training\**

**International standardization, certification, technology, raw materials and finished products.** At the present stage of development of society and its productive forces of standardization has become an important means to improve production efficiency and improve product quality. In view of the need to increase the demand for light industry in Ukraine and abroad, to increase its competitiveness, stimulate the creation of new, innovative products with unique properties inherent only vegetable raw materials, to meet consumer demands for quality and reliability of products, including continuous growth the volume of trade between countries is becoming increasingly important standardization and certification of products and production systems as light industry.

**Civil protection.** To teach students methods of population and improve the sustainability of agricultural production facilities in case of emergency, the basics of organizing and conducting rescue and other emergency operations while managing accidents, the consequences of natural disasters, prepare students for practical implementation of the civil defense facilities of agricultural production in emergency circumstances as chief of staff of civil defense facility.

**Technology of perfumery and cosmetic industries.** The subject of the study is a classification and range of international and domestic markets perfumes and cosmetic products, the main processes of perfumery and cosmetic industries, the main directions of modern principles of the fragrance and perfume recipes, modern technology and

equipment, manufacture of perfumes and cosmetics, the basic requirements for their quality and methods of control.

**Optimization of technological processes in the production of essential oil.** For masters of specialty “Technology of fats and fat substitutes”, the subject of study is contemporary processes of aromatic products and the main directions of optimization immersed theoretical aspects of the production of volatile oil production, the main improvement of manufacturing equipment, new essential oil products represented leading companies in the global and domestic markets, essential oil production.

**Designing of the enterprises with the basics of CAD.** To learn the computer systems and software applications that provide a solution to engineering and scientific problems, design tools and machines to acquire knowledge about the principles of operation and information-processing and computing for measuring complexes, learn methods of processing experimental data using universal and specialized computer programs to introduce the type and purpose CAD, give knowledge of the principles and techniques of 3D solid modeling tools and machines and methods of engineering analysis of designed structures using specialized software application.

**Basics of industrial construction and plumbing.** To give students the concept of industrial construction. To provide training in the field of food technology. To know the basics of industrial construction, basic building construction, industrial design principles, methodology of designing master plans of enterprises. Work with regulatory documentation. To be able to execute design solutions graphically manufacturing plant for the processing of agricultural products, to calculate production equipment. Develop creativity in designing industrial processing agricultural products and sanitary systems.

**Labour protection in the industry.** Theoretical and practical training to the creation and ongoing support of regulatory conditions, prevention of accidents and injuries in the agricultural production, preparation for implementation of the principles of the state policy of Ukraine on legal safe working conditions for agricultural enterprises.

**Scientific Research practical work in the specialty.** The object of study is the general aspects of the methodology, current status and major areas of research in the technology of fats and essential oils, familiarity with the most prominent developments leading scientists and as implementations of scientific research in the oil and essential oil production, the acquisition of practical skills with specialized literature, works in research laboratories and industrial sector.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professional and practical training\*

**Modern technology of fats and fat substitutes.** The object of study is the advanced properties of oil and fatty materials, basic modern production technology of vegetable oils and animal fats and their means of obtaining (Press, extraction, thermal), modern technology refining, modification and processing of vegetable oils and animal fats, technology and production equipment of oil fat of food and non-food goods, technology use substitutes.

**Optimization of technological processes in the perfume and cosmetic manufacture.** The object of study is the modern processes of perfumes and cosmetics and the main directions of optimization, advanced process equipment for the manufacture and packaging of perfumes and cosmetics, new fragrance and cosmetic products, which are made by using modern technology and are presented on the global market of perfume and cosmetics products.

**Prospective technology of industry.** The object of study is the modern, advanced technology oil industry - the latest technology blended vegetable oils and substitutes of milk fat, volatile oil extraction technology in the industry, Enzyme technology in the oil and

volatile oil industry, especially the introduction of new technologies into production in order to expand the range and enhance the competitiveness of the products.

**The operation and repair of technological equipment.** Study of methods and techniques of repair and restoration of agricultural machinery and technological equipment most effective way according to existing specifications, a student of deep theoretical and practical knowledge to machinery, detection and elimination of failures.

**Engineering calculations, accounting and reporting in the field.** Discipline has the aim of forming a systematic approach to accounting and reporting during the processes of volatile oil industry, technology of blended vegetable oils. Future professionals acquire knowledge as to calculation of raw materials, auxiliary materials, as well as the basics of accounting in the industry.

**Reliability of equipment of processing enterprises.** Developing of the skills of practical knowledge of methods and techniques to ensure the safety of the reliability and operational performance machines for the set time at optimum cost of material and labor resources, study methods and ways to maintain and restore performance and resource agricultural machinery and technological equipment most effective way according to existing technical requirements.

**Renewable energy sources in the manufacturing sector.** Provision of future specialists of theoretical and practical knowledge about the classification, technological and design features, the theory of designing systems for the use of alternative energy sources, the study of plants to convert solar, wind energy, waste heat milk, manure and air emissions, the study of the theoretical foundations of the workflow settings for converting alternative energy sources development of major technological calculations Sun for use in heating systems and energy, development of energy-saving technological foundations of design processes in agriculture using Sun.

**Technological quality of raw materials of perfumery and cosmetic industries.** Discipline creates skills in the latest techniques for determining the quality of raw materials for the production of blended vegetable oils and a milk fat substitutes, especially the introduction of new technologies into production in order to expand the range and improve competitiveness. Students learn the procedures of technochemical control, advanced technology refining, modification and processing of vegetable oils and animal fats, technology and equipment of oil and fat products of food and non-food goods, technology of using substitutes, the basic requirements for their quality and how they control the rules of the technological calculations.

## *2.2. Disciplines chosen by students*

### *2.1.1. Cycle of professional and practical training\**

#### *Production oriented disciplines*

#### **Master program “Technology of the essential oil production”**

**Methodology of teaching at the University.** The acquisition of the knowledge, skills and abilities that will provide needed for professional communicative ability in the areas of professional and academic teaching special subjects, improvement and further development of expertise in pedagogy, acquired by the degree program and learning at the university.

Features of the research work in the essential oil industry. The object of study is the general aspects of the methodology, current status and major areas of research in technology essential oils, familiarity with the most prominent developments leading scientists and as implementations of scientific research in essential oil production, the acquisition of practical skills with the literature, work in research and industrial sector laboratories.



**Aromatherapy.** The object of study is the chemical composition of the essential oil and its impact on the possibility of their use in aromatherapy in the process of rehabilitation and prevention of disease, existing restrictions on the use of essential oils in aromatherapy, essential oils justification of the physical and psychological health of human safety and the ability of individual allergic reactions rights to use certain essential oils in aromatherapy.

**The Master program “Technology of fats and fat substitutes”**

**Methodology of teaching at University.** The acquisition of the knowledge, skills and abilities that will provide needed for professional communicative ability in the areas of professional and academic teaching special subjects, improvement and further development of expertise in pedagogy, acquired by the degree program and learning at the university.

**Modern research of food science.** To provide knowledge about modern food technology and areas of development. Subject: the latest advances in technology staple foods. Modules: actual problems of food technology, the main trends in the world of food technology, food safety, food health care supplies and their characteristics, especially the requirements for food quality health care destination in the developed world; storage of raw materials and food products, food processing of quick-cooking cereals, technology of milk products, fruit and vegetable technology of products.

**Features of the research in the oil industry.** The object of study is the general aspects of the methodology, current status and major areas of research in technology fats; familiarity with the most prominent developments leading scientists and as implementations of scientific research in oil production, the acquisition of practical skills from the specialized literature, work in research and industrial industrial laboratories.



**Master Training**  
**in specialty “TECHNOLOGIES OF PRODUCTS OF FERMENTATION**  
**AND VITICULTURE”**  
**Branch of knowledge “Food and agricultural products”**

**Form of training, licensed number of students:**

– full-time 15  
– correspondence 10

**Term of study** 1,5 year

**Credits** 90 ECTS

**Language of teaching** Russian

**Qualification of graduates** research engineer of the technology of fermentative production and winemaking

**The concept of training**

Professionals who complete training in the specialty of “Technologies of Products of Fermentation and Viticulture” are capable creatively to apply their knowledge of winemaking technology, beer and soft drinks, alcohol production technology in manufacturing as well as in the scientific research. The specialist must know the methods and measures of getting a final product with the least impact on the environment. To be able to select properly the technology appropriate material and technical capabilities of a particular food business.

The formation of master's programs in the specialty “Technology of fermentation and wine” provides an in-depth study of modern systems of ecological safety of modern economic development company, country, world, new scientific developments.

**Production oriented master program**

***Master program “Technology of the fermentative production and winemaking”***

The Master program aims at training experts in the production of wine products, malt, beer, soft drinks and alcohol production.

The training program for master of the specialization of graduate student must show ability to solve simple and complex scientific technological and engineering problems, focusing on problems of improving product quality, to increase terms of its stability, to increase measures against falsification, organizing range of wines produced, development of low-and energy efficient technologies, waste production, improve the ecological environment, the ability to use computers.

**Sphere of graduates employment**

Graduates of “Technologies of Products of Fermentation and Viticulture” get qualification of “Master of Technology of fermentative production and winemaking”. They may hold the following positions: engineer, assistant engineer, an agricultural expert advisor, head of research, head of department design project materials, Head of Laboratory (research, training production), pilot production foreman, chief project engineer, university professor, teacher of the professional educational institutions etc.

---

### **Practical training**

Provides the following practice areas: engineering and research-teaching.

Engineering practice focused on learning the basic areas of engineering. During the practical training future specialist are taught the duties of the volume and content of the basic activities of management and accountability of employees, workplace organization, forms, reports, documents, issues of accountability of employees.

Research and teaching practice contributes to future professionals the practical skills of scientific and educational activities to learn the advanced achievements of science and practice in fermentation and wine production and scientific-pedagogical work.

The bases of practical training of students graduate in winemaking and fermentation technology industries are: factory "Alushta", "Burluk", the farm "Maharach", "Emerald", "Evpatoria Wine Plant", "Pervomaiskiy wine plant", "Zolotaja Balka", "Saki winery".

### **Proposed Topics for Master Theses**

1. Development of technology and hardware solutions of producing white wine materials.
2. Improving technology and hardware solutions of Madeira "Taurida".
3. Improvement in the production process of getting cognac alcohol and its hardware solutions at the winery.
4. Development of technology and hardware solutions making red table wines by carbon dioxide maceration.
5. Improving technology and manufacturing high quality hardware solutions of "Madeira" by the intensification of maturation.
6. The perfection of process parameters and hardware solutions making white wines semi classical way.
7. The improving of the technology and hardware solutions of sherry production by depth method.
8. The improving of the technology and hardware solutions of producing of the classical champagne by immobilized yeast at the factories of champagne.
9. The improvement of technology and technical solutions of dessert wines in the southern part of the Crimean coast.
10. The improving of the technology and hardware solutions of making beer wort.

### **Academic rights of applicants for a master program**

In addition to the specialty "Technologies of Products of Fermentation and Viticulture" applicants with a bachelor diploma in the field of "Food Technology and Engineering" can continue studying the field of knowledge **0517 "Food and agricultural products"**:

- 8.05170104 – Technologies of Preservation, Conservation and Processing of Meat (see p. 163);
- 8.05170105 – Technologies of Preservation and Processing of Water Bioresources (see p. 169);

specialties in the **branch of knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
  - 8.18010021 – "Pedagogy of Higher School"(see p. 434);
  - 8.18010018 – Administrative management (see p. 397);
  - 8.18010020 – "Educational Institution Management" (see p. 427)
-

MASTER DEGREE PROGRAMS

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “TECHNOLOGIES OF PRODUCTS OF FERMENTATION  
AND VITICULTURE”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Philosophy of science and innovation development	1	72	1,3	2,0
2	Strategy of sustainable development of nature and society	1	72	1,3	2,0
3	Management and Marketing	1	90	1,7	2,5
4	Psychology, education and fundamentals of teaching	1	72	1,3	2,0
<i>Total number</i>			306	5,6	8,5
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Innovative technologies of products of fermentation and winemaking	2,3	162	3,0	4,5
2	Mathematical modeling of computer	2	144	2,7	4,0
3	Environmental problems in the production	3	90	1,7	2,5
<i>Total number</i>			396	7,4	11,0
<i>1.3. Cycle of professional and practical training*</i>					
1	International standardization and certification technologies, raw materials and finished products	1	72	1,3	2,0
2	Civil protection	1	90	1,7	2,5
3	Specific winemaking	1	162	3,0	4,5
4	Features of the winemaking regions of the world	1	126	2,3	3,5
5	Designing of the basics of CAD	1	108	2,0	3,0
6	Fundamentals of industrial construction and plumbing	1	72	1,3	2,0
7	Labour protection in the field of production	1	72	1,3	2,0
8	Research and practical specialty	2,3	288	5,2	8,0
<i>Total number</i>			990	16,7	27,5
Total according to regulatory part			1692	31,3	47,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of professional and practical training*</i>					
1	Optimization of fermentation production Optimization of fermentation production processes	2,3	108	2,0	3,0
2	Normative and technical documents in wine industry	1	90	1,6	2,5
3	Perspective technologies of industry	2	72	1,3	2,0
4	Maintenance and repair of technological equipment	1	72	1,3	2,0
5	Technological calculations, accounting and reporting in the industry	1	72	1,3	2,0
6	Reliability of the equipment of processing enterprises	1	72	1,3	2,0
7	Renewable sources of energy in manufacturing industry	2,3	72	1,3	2,0
8	Modern technologies in winemaking	1	72	1,3	2,0
<i>Total chosen by university</i>			630	11,7	17,5
<b>2.2. Disciplines chosen by students</b>					
<i>2.2.1. Cycle of professional and practical training *</i>					
Master program "Technology of fermentative production and winemaking"					
1	Methodology of teaching in Universities	2,3	72	1,3	2,0
2	Modern Food Science Research	2	90	1,7	2,5
<i>Total selected by the students</i>			162	3,0	4,5

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
Total number of elected part			810	15,0	22,5
Practical training			432	8,0	12,0
Writing and defense of master's thesis			216	4,0	6,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

**Annotations of disciplines in the curriculum**

**1. REGULATORY ACADEMIC DISCIPLINES**

*1.1. Cycle of humanitarian, social and economic training\**

**Philosophy of science and innovation.** The course covers the specifics of the philosophy of science and innovation development as a special type of human knowledge and as an academic discipline, gives a characteristic of the historical development of major trends and methodological techniques, solve the main problems of philosophy of science, the methodological, structural, ideological and value principles and characteristics of scientific knowledge, gives the philosophical analysis of the specific current state of world and domestic science, the prospects for their development and interaction with other spheres of society.

**Strategy of the stable development of nature and society.** Discipline provides the formation of knowledge about optimizing and harmonizing of the relationship between man and the environment, creating theoretically reasonable efforts to stabilize and improve the environmental situation in the present socio-economic conditions. Any human activity affects the environment, and deterioration of the biosphere is dangerous to all living things, including humans. It put forward to preserve the biosphere of our planet. A comprehensive study of existing problems of man's relationship with the environment should provide strategic approaches to address both immediate and prospective planetary problems of people.

**Management and Marketing.** Learning of the content management process of an engineering and technical service processing enterprises, a theoretical and practical knowledge and skills of students in the scientific management of engineering enterprises of different ownership forms, mastering the theoretical principles of management and marketing skills and application of knowledge in the practice of specialists in the field: food technology and engineering, the study of organizational management structure and its optimization problems in terms of market relations, mastering techniques of modern management.

**Psychology, education and the basics of teaching.** Students need to identify the basic concepts of psychology and pedagogy, subject and tasks of psychology and pedagogy, psychology place in the sciences; major categories of psychology, industrial psychology and cognitive processes, psychological aspects of human activity in the control system; physiological requirements to technical requirements of "man-technology-machine". The main attention is paid to the class conscious assimilation theory pedagogy of higher education, coverage and pedagogical justification of laws, phenomena and facts of scientific reasoning, and creating self teaching scientific thinking, new approaches in the educational process of analysis and generalization of teaching experience.

*1.2. Cycle of natural science (fundamental) training\**

**Innovative technologies of products of fermentation and winemaking.** While the discipline innovative technology products of fermentation and winemaking techniques undergraduates studying features of the experiments, organizing, analyzing, and

evaluating the results of research, design research work, copyright and patent documents in wine. The main areas of study: technology of dry and semi-sweet table wine, grape alcohol and getting production from its use fortified wines.

**Mathematical modeling of computer.** Develop in students the knowledge and skills necessary to formalize and model construction engineering tasks, selection methods and analysis tools of modern software applications for PC, running the operating system Windows, examine methods of management models – solving optimization problems, methods of descriptive models – problem solving strength and of heat and mass transfer.

**Ecological problems of in the industry.** To familiarize students with the fundamental provisions of theoretical ecology, especially the relationship of the biosphere and technosphere, regional to global environmental problems, the problems of resource and environmental and economic perspective, and with modern principles and strategies for sustainable development, and by means of harmonization of economic development of society and secure development environment.

### *1.3. Cycle of professional and practical training\**

**International standardization, certification, technology, raw materials and finished products.** At the present stage of development of society and its productive forces of standardization has become an important means to improve production efficiency and improve product quality. In view of the need to increase the demand for light industry in Ukraine and abroad, to increase its competitiveness, stimulate the creation of new, innovative products with unique properties inherent only vegetable raw materials, to meet consumer demands for quality and reliability of products, including continuous growth of the volume of trade between countries standardization and certification of products and production systems is becoming increasingly important in light industry.

**Civil protection.** To teach students methods of population and to improve the sustainability of agricultural production facilities in case of emergency, the basics of organizing and conducting rescue and other emergency operations while managing accidents, the consequences of natural disasters, to prepare students for practical implementation of the civil defense facilities of agricultural production in emergency circumstances as chief of staff of civil defense facility.

**The Specific of winemaking.** Discipline aims at the acquisition of knowledge by students with special technology for various types of wine and brandy, with characteristics of blending, processing blends of wines and brandies before releasing the rules of ripening vintage and ordinary wine products, standard requirements for raw materials and finished products.

**Features of the wine regions in the world.** Discipline allows students to master the basic features of wine products in Europe, America, South Africa and Australia. Students acquaint with viticulture of these countries, range of produced wines, winemaking traditions of different regions wineries.

**Designing of the enterprises with the basics of CAD.** Learn the computer systems and software applications that provide a solution to engineering and scientific problems, design tools and machines to acquire knowledge about the principles of operation and information-processing (IYIS) and computing (IEC) for measuring complexes, learn methods of processing experimental data using universal and specialized computer programs to introduce the type and purpose CAD, give knowledge of the principles and techniques of 3D solid modeling tools and machines and methods of engineering analysis of designed structures using specialized software application.

**Basics of industrial construction and plumbing.** Give students the concept of industrial construction. Provide training in the field of food technology. Know the basics of industrial construction, basic building construction, industrial design principles, methodology of designing master plans of enterprises. Work with regulatory

---

documentation. To be able to execute design solutions graphically manufacturing plant for the processing of agricultural products, to calculate production equipment. Develop creativity in designing of the industrial processing of agricultural products and sanitary systems.

**Labour protection in the industry.** Theoretical and practical training to the creation and ongoing support of regulatory conditions, prevention of accidents and injuries in the agricultural production, preparation for implementation of the principles of the state policy of Ukraine on legal safe working conditions for agricultural enterprises.

**Technological quality of raw materials of the distillery production.** Discipline creates a future specialists skill in the latest techniques for determining the quality of raw materials for the production of food and alcohol, and material for making liqueurs, fruit liqueurs. Students learn the procedures for technochemical control raw grain, potatoes, molasses and sugar beet plant material for the production of liqueurs and fruit liqueur, rules of technical calculations.

**Scientific Research practical work in the specialty.** The object of study is the general aspects of the methodology, current status and major areas of research in the technology of fats and essential oils, familiarity with the most prominent developments leading scientists and as implementations of scientific research in the oil and essential oil production, the acquisition of practical skills with specialized literature, works in research laboratories and industrial sector.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professional and practical training\*

**Optimization of fermentation processes productions.** In the course of the discipline undergraduates studying particular methods of experimentation, systematization, analysis and evaluation of research, design research work, copyright and patent documents in wine. The main areas of study: technology of dry and semi-sweet table wine, grape alcohol and getting production from its use fortified wines.

**Regulatory and technical documentation in winemaking.** In the study of this subject student receives theoretical and practical knowledge on standardization, metrology software and organization of technochemical control at the winery. Particular attention is paid to the requirements and application standards series ISO, requirements management system of food safety requirements of the laws of Ukraine.

**Prospective technologies of industry.** Discipline teach students the scientific and technical progress in advanced winemaking countries – France, Germany, Italy, Israel and the United States. Students study the expected improvement of production processes table, dessert, fortified typical(Sherry, Madeira) wines and wines rich carbonated in bottles and tanks. A separate study advanced technology leaven and soft drinks, and food production of ethyl alcohol and alcoholic beverages.

**Maintenance and repair of technological equipment.** Study of methods and techniques of repair and rehabilitation of agricultural machinery and technological equipment as the most effective way of existing specifications, give a student deep theoretical and practical knowledge of machinery, detection and elimination of failures.

**Engineering calculations, accounting and reporting in the industry.** The aim of the discipline is forming of a systematic approach to accounting and reporting during the processes of volatile oil industry, technology blended vegetable oils. Future professionals acquire knowledge as to calculation of raw materials, auxiliary materials, as well as the basics of accounting in the industry.

**Reliability of equipment of processing enterprises.** The developing of the skills of practical knowledge of methods and techniques to ensure the safety of the reliability and operational performance machines for the set time at optimum cost of material and labor

resources, study methods and ways to maintain and restore ability to work and resource of agricultural machinery and technological equipment as the most effective way of the existing technical requirements.

**Renewable energy sources in the manufacturing sector.** To provide the future specialists theoretical and practical knowledge about the classification, technological and design features, the theory of designing systems for the use of alternative energy sources, the study of units to convert solar, wind energy, waste of the heat milk, manure and air emissions, the study of the theoretical foundations of the workflow settings for converting alternative energy sources development of major technological calculations for use in heating systems and energy, development of energy-saving technological foundations of design processes in agriculture using alternative energy sources.

**Modern technologies of winemaking.** Discipline includes modern wine marketing and legal aspects of winemaking. Students learn advanced Winery law (legislation) of Europe, Moldova, Ukraine and Georgia. Students make acquainted with four groups of regulations adopted in Ukraine for the wine industry, exploring wine market organization and principles of marketing wine.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical training\**

#### **Master program “Technology of fermentative production”**

**Methodology of teaching in the university.** The acquisition of the knowledge, skills and abilities that will provide needed for professional communicative ability in the areas of professional and academic teaching special subjects, improvement and further development of expertise in pedagogy, acquired by the degree program and learning at the university.

**Modern research of food science.** To provide knowledge about modern food technology and areas of development. Subject: the latest advances in technology staple foods. Modules: actual problems of food technology, the main trends in the world of food technology, food safety, food health care supplies and their characteristics, especially the requirements for food quality health care destination in the developed world; storage of raw materials and food products, food processing of quick-cooking cereals technologies, the technologies of milk products, fruit and vegetable technologies of products.

---



**Master Training  
in specialty “AGRONOMY”  
Branch of knowledge “Agriculture and Forestry”**

**Form of training, licensed number of students:**

– full-time	50
– correspondence	50
<b>Term of study</b>	<b>1,5 years</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian, Russian</b>
<b>Qualification of graduates</b>	<b>agronomist-researcher</b>

**The concept of training**

Training of Masters at the faculty of Agronomy SB NUL&ES of Ukraine “Crimean Agritechnological University” has been started since 2002 year. The faculty organizes and coordinates the academic process aimed at training of specialists with knowledge of modern technologies of production, storing and primary processing of plant products, horticulture, viticulture, cultivation of fruit, berries and grapes, systems of plant protection and agro-chemical software of modern technological processes in plant growing, fruit growing, vegetable growing and viticulture and provides cultural and educational work among the students.

The organization of the educational process for students of Master includes the production and research specializations for each specialty. It allows to graduates to have enough theoretical and practical training before the working in the agricultural enterprises specializing in the production, storing and processing of plant products, products of horticulture and viticulture or in academic institutions specializing in solving scientific problems in Agronomy, agroinformation technologies and systems, horticulture and viticulture, selection and genetics of agricultural crops, plant protection or to continue training in postgraduate study.

**Production oriented master program**

***Master program “Management of field cultures crops productivity”***

Innovative adaptive technology for growing crops. Scientific bases of seed-growing of grain crops, sort qualities and yielding properties of seeds. Technology of seeds production, intercompany and state control in seed grain crops.

***Master program “Justification and development of the ecological adaptive of farming system”***

Analysis and state of farming systems, the direction of their development based on the greening of industry, solving the problems of environment protection, production of agricultural products.

**Sphere of graduates employment**

According to the obtained qualification “Master” graduates of specialty “Agronomy” have an opportunity to hold the following posts: chief agronomist, head of utility agriculture sector, the head of the brigade, Director (manager) of small agricultural enterprises, agronomist-researcher, Junior scientific researcher (Agronomy), scientific collaborator (Agronomy), scientific collaborator-consultant (Agronomy), an agronomist, an agronomist of the airfield, an agronomist of seed-growing, plant protection agronomist, an agronomist-inspector, agricultural adviser, the agricultural expert-consultant.

The employment of Master`s graduates is in the agricultural enterprises of different ownership forms, in the state veterinary and phytosanitary service, scientific-research institutions of the NAS of Ukraine and NAAN of Ukraine, state nature reserves, sanctuaries, regional and district institutions, advanced agro-industrial farms, etc.

### **Research oriented master program**

#### ***Master program “Scientific bases of management formation of biological productivity of field crops agroecosystems”***

Scientific substantiation of different farming systems on the basis of the greening of industry, increasing productivity of the crop rotation, the production and the quality of agricultural products and the solving environmental problems. Development and optimization of technological processes of agricultural crops cultivation, their adaptation to the specific hydrothermal and economic conditions. Increasing the level of biological potential use of territory, sorts and hybrids. Genetics and breeding methods for creating and evaluation of sorts and hybrids of agricultural crops, their adaptability to the conditions of cultivation. The registration, legal protection of sorts and hybrids. Development and substantiation of the forage production system for households with different specialization in production of animal breeding products.

#### **Sphere of graduates employment**

Admission to postgraduate study in SB NUL&ES of Ukraine “Crimean Agritechnological University”, other educational institutions, scientific and research institutions of the NAS of Ukraine and NAAN of Ukraine.

#### **Practical training**

The bases of practical training of the Master`s graduates of specialty “Agronomy” are: experimental field SB NUL&ES of Ukraine “Crimean Agritechnological University” total area of 110 hectares, educational and scientific plant growing Technology Center (ESPTC), SE Frunze SB NUL&ES of Ukraine, “Crimean Institute of Agriculture of NAAS of Ukraine, JSC Agro № 49, № 55, № 62, № 66, LLC them. Krupskaya of Nijnegorskiy district, JSC Plemzavod “Crimea” of Sakskiy district, ALLC “Shturm Perekopa” of Krasnoperekopskiy district, SPK “Georgia” and LLC SVP “Agrotechnology” of Pervomaiskiy district, LLC AF “Friendship of people” and SKhP “Boris-agro” of Krasnogvardeiskiy district, PC “Pobeda” OF Nijnegorskiy district, PSP “Dream” of Sakskiy district, CJSC “Crimean fruit company”, TA “Simferopol” of Simferopolskiy district, LLC “Lobanovo-agro” of Dzhankoyskiy district, “Priozernoye-agro” of Sakskiy district, “Primorye-agro”, “Bilyaus-agro”, “Tarkhankut-agro” of the Black sea region, CJSC “Kakhovsky” of Kakhovskiy district, Kherson region, LLC “Agrolux” of Yakimovskiy district, SE “Revival” of Zaporozhskiy region.

#### **Proposed Topics for Master Theses**

1. Improvement of technologies of grain crops cultivation in accordance with the world standards of quality.
  2. Management of high agrophytocoenoses seed crops.
  3. Varietal, sowing and harvest-giving properties of seeds depending on the biotic and abiotic factors of the environment.
  4. Seed heterotic sorghum hybrids.
  5. Agro-economic analysis and improvement of the adaptive systems of agriculture in the farms of different forms of ownership.
  6. Agro-economic analysis and improvement of the areas under crops structure and crop rotations in the farms of different forms of ownership.
-

**MASTER DEGREE PROGRAMS**

7. Scientific substantiation of the resource ensure expanded reproduction of soil fertility in different soil climatic conditions.

8. Learning of the field crops productivity with long-term using of the various systems of fertilizers and soil processing in crop rotation.

9. Learning the field crops productivity with long-term combination of various systems of fertilizer and tillage of the soil-conservation crop rotation.

10. Adapting agritechnological elements to specific hydrothermal and economic conditions.

**Academic rights of applicants for a master program**

In addition to the specialty “Agronomy” applicants with a bachelor degree in the direction of “Agriculture” can continue studying discipline **“Agriculture and Forestry”**:

- 8.09010102 – Agrochemistry and Soil Science (see p. 41);
- 8.09010104 – Fruit and Vegetable Science and Viticulture (see p. 51);
- 8.09010105 – Selection and Genetics of Agricultural Crops (see p. 65);

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”, (see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Agronomy”**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Agrarian and ecological law	1	72	1,3	2,0
2	Business foreign language	1	72	1,3	2,0
3	The philosophy of science	1	72	1,3	2,0
4	Psychology and Pedagogy	1	72	1,3	2,0
5	Economics and Organization of the agricultural service	1	72	1,3	2,0
<i>Total number</i>			360	6,5	10,0
<i>1.2. Cycle of natural science training*</i>					
1	Information Technology	2	126	2,3	3,5
2	Modeling of technological processes and systems	1	108	2,0	3,0
3	Geographic information systems	2	144	2,7	4,0
<i>Total number</i>			378	7,0	10,5
<i>1.3. Cycle of professional and practical training*</i>					
1	Adaptive farming systems	2	144	2,7	4,0
2	Methods and organization of research in agronomy	1	108	2,0	3,0
3	Systems of modern intensive technologies	1	144	2,7	4,0
4	Weather and programming yields of crops	2	72	1,3	2,0
5	Global agricultural technologies	2	72	1,3	2,0
6	Modern problems of agrienvironment	2	72	1,3	2,0
7	Special genetics	2	72	1,3	2,0
8	Biotechnology in plant growing	1	72	1,3	2,0
9	Civil protection	2	36	0,7	1,0
<i>Total number</i>			792	15,0	22,0
<i>Total according to regulatory part</i>			1530	28,5	42,5

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional and practical training*					
Production oriented disciplines					
1	Ecological problems of agriculture	3	72	1,3	2,0
2	Innovative technologies in plant growing	3	72	1,3	2,0
3	Technologies of creation and using the fodder lands	3	72	1,3	2,0
4	International standardization and certification of technologies, raw materials and finished products	1	54	1,0	1,5
5	The strategy of sustainable development of nature and society	1	36	0,7	1,0
6	Energy and commodity plant resources	3	72	1,3	2,0
7	Varietal resources of major crops and peculiarities of their seed production	3	72	1,3	2,0
8	Standardization and certification in plant growing	3	72	1,3	2,0
<i>Total chosen by university</i>			522	9,7	14,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training*					
Production oriented disciplines					
Master program "Justification and development of the ecological adaptive farming system"					
1	The scientific aspects of agriculture	3	72	1,3	2,0
2	Crop rotation in modern agriculture	3	72	1,3	2,0
3	Resource-saving technology of mechanical soil cultivation	3	108	2,0	3,0
4	Integrated weed control in modern agriculture	3	72	1,3	2,0
5	Agroeconomic substantiation and development of adaptive systems of agriculture	3	144	2,7	4,0
<i>Total selected by the students</i>			468	8,7	13,0
Master program "Management of the field cultures crops` productivity"					
1	Agribiological bases of management of the field cultures crops productivity	3	108	2,0	3,0
2	Scientific and practical bases of management of formation of plant growing production quality	3	108	2,0	3,0
3	Agromonitoring and information technologies in the modern plant growing	3	108	2,0	3,0
4	Adaptive technology for production of ecologically pure products of plant growing	3	144	2,0	4,0
<i>Total selected by the students</i>			468	2,7	13,0
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional and practical training*					
Research oriented disciplines					
1	The scientific justification of the crop production sustainability	3	72	1,3	2,0
2	Agroinformation systems and technologies in plant growing	3	108	2,0	3,0
3	Greening and Biologization processes in plant	3	90	1,7	3,0
4	Methods and organization of research in plant	3	72	1,3	2,0
5	Standardization and certification in plant growing	3	90	1,7	3,0
<i>Total chosen by university</i>			432	8,0	13,0
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training*					
Research oriented disciplines					
Master program "Scientific bases of management formation of biological productivity of field crops agroecosystems"					
1	Agrophysics	3	72	1,3	2,0
2	The scientific aspects of agriculture	3	72	1,3	2,0
3	Agrobioreources of crop production and their	3	72	1,3	2,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Number		
			hours	Credits	
				national	national
	rational using				
4	Scientific and agrobiological basis of performance management field phytocenosis	3	108	2	3,0
5	Quality management of field crops in the technological process	3	72	1,3	2,0
6	Organization and technology of productivity improvement and rational use of natural pastures of Crimea	3	72	1,3	2,0
<i>Total selected by the students</i>			468	2,7	13,0
Total number of elected part			990	18,3	27,5
Practical training			360	6,7	10,0
Writing and defense of master's thesis			360	6,7	10,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of humanitarian, social and economic training\**

**Agrarian and ecological law.** The subject of the agrarian and environmental law, their principles and system; the sources of agrarian and environmental law, their definition and classification; agrarian relations (concept, types, characteristics, classification); state regulation of agriculture (content, form, the system of state bodies, etc.); the legal position of the various agricultural subjects (farms, agricultural cooperatives, private farms); peculiarities of the reform of the agrarian relations.

**Business foreign language.** Complex teaching of the language in professional activity. Types of language: reading, listening, speaking. Formation of the dialogic and monologue speech skills and prepare students for professional communication in an oral and written forms in a foreign language. To master the skills in translation of special texts as the means of adequate presentation of the content of scientific information. The formation of knowledge, skills and abilities, which will ensure the necessary for the masters communicative ability in the sphere of professional communication: in particular, the ability to organize and conduct a scientific conference in the specialty, to participate in the conference and to make a scientific report, to conduct a business meeting or negotiations with foreign counterparts and partners.

**Philosophy of Science.** Cognition, types of cognition. Specificity of scientific cognition. Structure and dynamics of cognition. Cognition and philosophy in the history of their relationship. Science in the philosophy. The main methods in the development of science: scientific hypothesis, experiment, observation. Value of the empirical and theoretical levels of cognition. Main areas and schools of philosophy of science. The problem of justifying knowledge and criterion validity of knowledge. Types of methods and their response: induction, deduction, analysis, synthesis, analogy, simulation, abstraction, idealization, axiological and hypothetico, deductive method. Empirical and theoretical methods, their relationship.

**Psychology and pedagogy.** The modern condition of General psychology. Biosocial nature of the human psyche. The development of the psyche. Mental processes: sensation, perception, memory, attention, thinking, speech, emotions. The structural components of the mentality, feelings, intellect, will, character, temperament, ability. Methods of psychical research. The essence of the learning process, its driving force. Principles of didactics. Forms and methods of training and education. Types of training. Pedagogical technologies.

**Economics and agricultural service`s organization.** Principles for the establishment of agricultural service cooperatives, foundations of rational organization of the agricultural service, the economic relations between the production and servicing, the relations arising in the process of formation and functioning of the agricultural service`s system.

*1.2. Cycle of natural science training\**

**Information Technology.** Mastery of practical skills on PC with modern computer technology. Purpose, structure and function of modern software. Finding, using and providing the information through the Internet.

**Modeling of processes and systems.** Building the models of production processes patterns and crop production development solutions for effective management of biotechnological processes.

**Geographic Information Systems.** Using GIS to predict yield changes in the dynamics of soil fertility, planning the using of chemicals, agro zoning area.

*1.3. Cycle of professional and practical training\**

**Adaptive systems of agriculture.** Historical development of agriculture, the modern contents of their components, scientific principles and methods of constructing adaptive regulation of agriculture.

**Methods and organization of researching in agronomy.** Planning of researching. Development the scientific hypotheses. Methods of laying field and laboratory experiments. Statistical analysis of the results. Documentation. Reporting.

**Systems of modern intensive technologies.** Status and development of modern systems of intensive technology of crops cultivation.

**Forecast and programming yields of agricultural crops.** The theoretical basis of planning cultivation and yields forecasting. Practical principles of criteria quantitative for biological, agricultural chemical, meteorological, phytometric characteristics and factors of the environment for programming and forecasting agricultural crops yields.

**Global agro-technologies.** Tendencies of agricultural technologies development in the countries all over the world. World experience in farming. The way of integration of Ukraine agriculture into the world economy.

**Modern problems of agri-environment.** The formation of ecology. Ecology as a science. The system of modern intensive technologies (crop rotation, tillage, weed control, systems of fertilizers and plant protection, new technologies in plant-growing) and their impact on the degradation processes in nature, as well as problems and prospects of ecological agricultural production. Sanitary-hygienic and ecological aspects of fertilizers using. Rules of pesticides` using. Cultivation only ecological products. Ecological aspects of plant growing under the conditions of radioactive territory contamination.

**Special genetics.** Genetic basis of the major agricultural crops breeding.

**Biotechnology in crop production.** Theoretical and practical problems of agricultural plants biotechnology. The isolated cells and tissues cultivation. Morphogenesis and regeneration in the culture of cells and plants tissues. Introduction of tissues and cells in culture in vitro. Optimization of nutrients environment. Using of microclonal reproduction, cells selection, culture of embryos, the anthers, seed-buds for the new plant forms creation. Genetic engineering.

**Civil protection.** It is theoretical and practical student`s preparation in questions about the organization of employees protection in the national economy; learning of ways and methods about improvement of organization and carrying out rescue and other urgent works on liquidation of accidents, catastrophes, natural disasters and in lesions associated with the impact of mass destruction weapons.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professional and practical training\*

##### *Production oriented disciplines*

**Ecological problems of agriculture.** The history and development of the main causes of ecological imbalance agriculture. Rational structure features of the land using in Ukraine and its environmental assessment. Content and status of organic matter in the soil as a function of ecological agriculture and its prediction in the rotation. Environmental concerns of pesticides, including herbicides in agriculture. Complex of protection measures of agricultural crops against the weeds. Environmentally sound measures and systems of mechanical processing of soil, agro physical and physic-chemical degradation, protection from erosion and deflation. The basics of the ecological monitoring of agro landscapes and using the results in the agricultural practice.

**Innovative technologies in plant growing.** The subject of the discipline consists the studying of contemporary innovative elements of cultivation technologies of major field crops – wheat, corn, soya bean, peas, sunflower, winter rape, flax, alfalfa seeds. The elements of technology innovation system include tillage, pesticides, modern agricultural machinery and so on.

**Agrotechnologies of creation and grassland using.** Basic concepts and principles of creation and grassland using management; agro biological characteristics of fodder crops, their economic and feasibility; modern adaptive, resource-saving technologies of fodder crops cultivation; the system of production farms with different forms of property; the analysis of technologies with the help of econometric methods and the adoption of a sound technological solutions.

**International standardization, certification of technologies, raw materials and finished products.** To study the basic principles of international and regional organization activities in standardization and certification of agricultural products, their structures and services, duties and rights; the main provisions of international and European legislation in the sphere of standardization and certification.

**The strategy of sustainable development of nature and society.** Forming the knowledge of the principles and strategies of sustainable development as a harmonious process, which ensures sustainable economic convergence, promotes environmental ecological culture, preservation of natural resources and ensures Biosphere space and environmental safety to meet the needs of human life. Learn provision of practical implementation mechanisms, coordination and harmonization of social, economic and environmental sustainable society in the country. Promotes mastery and skills monitoring of sustainable development indicators, identifying environmental risks and hazards for human development and sustainable development, using the international agreements and documents related to sustainable development, development plans and programs during the transition to sustainable development of Ukraine and other countries in transition.

**Energy and raw plant resources.** Energy and raw material resources and prospects of plant material for energy sources, agribiological features of these cultures, ways of improving their production technology, implementation of advanced technology systems.

**Varietal resources of major crops and peculiarities of their seed.** Varietal resources of Ukraine, using of varieties and hybrids, which are entered in the State register of plant varieties of Ukraine in certain zones of cultivation, and the legal side of the seed.

**Standardization and Certification in crop production.** Subject: learning the government regulations, standards of products quality produced in plant as well as familiarity with the methods of control using in determining the quality and preparation for certification.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training\**

*Production oriented disciplines*

**Master program “Justification and development of the ecological adaptive farming system”**

**Scientific aspects of agriculture.** Basic laws of Agriculture. Soil fertility, its types and kinds. The way of playing. Landscape agriculture, its essence, scientific and practical bases of sustainable development of agro-landscapes. Recultivation of lands and the methods of its implementation. Biological agriculture, its essence. Precision agriculture, its essence. The heterogeneity of the soil. Implementation of agritechnological activities in precision agriculture. Heterogeneity of soil. Implementation of agritechnical measures in precision agriculture.

**Rotation in modern agriculture.** Modern Ukrainian farming, crop rotation as important; theoretical and practical knowledge of the competitive crops selection, development of appropriate crop pattern, designing effective crop rotations to the existing landscape and soil and agro-climatic conditions and specific needs in agricultural markets.

**Resource-saving technologies of mechanical tillage.** Rational technology mechanical tillage including soil and climatic conditions and their using in modern technologies of crop production to produce high and stable yields.

**Integrated pollution control in modern agriculture.** Morphological, botanical and biological peculiarities of weed plants, a complex of organizational, agro-technical, chemical, and biological activities aimed at the effective weeds` control in agrophytocenose, on the rational land using, the preservation and improvement of soil fertility for high and sustainable crop yields.

**Agro-economic substantiation and development of the adaptive systems of agriculture.** Complex of agri-economic, agritechnical, reclamation and organizational activities aimed at efficient use of soil, cultivation of high and sustainable crop yields with high economic efficiency in different soil-climatic zones of Ukraine.

**Master program “Management of field cultures of crops productivity”**

**Agrobiological bases of management of field production of crops productivity.** Agrobiological basis and practical ways to control the field production of crops productivity in accordance with the real hydrothermal conditions, the water regime of soils, their security of mineral nutrition elements and the actual crops condition.

**Agromonitoring and information technologies in the modern plant.** Crops` monitoring (state of plants in crops, state of the environment, the prevalence of diseases and pests; the monitoring of the availability elements of soil power, level of soil fertility; monitoring of the environmental factors; monitoring of the yield and quality of agricultural products.

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of professional and practical training\**

*Research oriented disciplines*

**The scientific justification for sustainable crop production.** The concept of sustainable plant-growing has multi-faceted development. Beside these basic biological components, it includes a number of other factors that must be considered an agricultural producer in the course of its production activities. In particular, such as soil-climatic conditions of the production functioning, meteorological factors period of vegetation of crops, the socio-economic situation in the region, the state of the market, presence of necessary material and technical support, professional level of performers and so on.

---



**Agroinformation systems and technologies in plant growing.** The subject of the discipline consists in studying of scientific bases and practical methods of scientific research in plant breeding and using it-tools to support agritechnology. Modern information technologies in the organization of researching process in crops production, analysis of agroinformation and management of machinery field crops cultivation.

**Greening and biologization processes in plant breeding.** The subject of discipline is field crops and their sorts, especially their biology, ecobiological cultivation technology of high persistent organic crops yields of the best quality, relevant set of environmental standards, the use of biologics, least cost of labor, equipment, rational expenditure of material and energy resources.

**Methods and organization of research in plant growing.** Subject discipline is studying the scientific and practical ways to carry out research in agronomy. The main attention is paid to the organization of research and the specifics of planning, optimization of bookmarks and analysis of multivariate regression experiments with a lot of options.

**Standardization and certification in crops production.** The subject of the discipline consists in studying the bases of metrology of the state normative acts and requirements of the measuring equipment to ensure the unity of measurements in scientific research.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical training\**

#### *Research oriented disciplines*

#### **Master program “Scientific bases of management formation of biological productivity of field crops agrocenoses”**

**Agrophysics.** Agrophysics as a science and a brief history of its development. The conditions of the external environment, measures for their optimization in order to achieve high and sustainable crop yields. Plant and light. Solid phase of soil. Soil moisture. Soil`air. The ecological role of soil air and the impact of aeration on the development of agricultural plants. The radioactivity of the soil and specific features of agricultural production in conditions of radioactive contamination.

**Scientific aspects of agriculture.** Basic laws of Agriculture. Soil fertility, its types and kinds. The way of playing. Landscape agriculture, its essence, scientific and practical bases of sustainable development of agro-landscapes. Recultivation of lands and the methods of its implementation. Biological agriculture, its essence. Precision agriculture, its essence. The heterogeneity of the soil. Implementation of agrotechnological activities in precision agriculture. Heterogeneity of soil. Implementation of Agrotechnical measures in precision agriculture.

**Agro bio-resources of crop production and their rational use.** The subject of the discipline are field crops and their varieties, peculiarities of their biology, technology of growing of agricultural crops high-sustainable yields in the best quality, consistent with the established environmental standards at the lowest possible cost of labour, equipment, rational expenditure of material and energy resources.

**Scientific and agrobiological basis of performance field phytocenoses management.** Scientific and agrobiological basis of field phytocenoses management. The discipline includes the questions connected with the scientific rationale for the agrobiological bases of formation management of the field crops agrophytocenosis` productivity with consideration of the separate and combined impacts of weather, organizational-economic, agro technological factors, the reaction to them of plants and other components of agrophytocenoses. The studying process contributes the expansion of horizons of the highest qualification future specialists, improvement of their vocational

training, will help to equip them as profound theoretical knowledge and practical skills of application of modern management methods.

**Management of field crops quality in the technological process.** In the course of studying the discipline considers the questions about the quality production at each stage of technological soil processing process, seed preparation, care of crops and harvest.

**Organization and technology of productivity improvement and the rational use of natural pastures of Crimea.** The discipline studies the species composition, productivity, dynamics of vegetation cover as well as the classification of the natural pastures of Crimea; agricultural methods of increasing their performance; the main activities of organization of rational use of natural pastures, which contribute the productivity of grass increasing and economic effectiveness of their exploitation.

---

**Master Training  
in specialty “FRUIT AND VEGETABLE SCIENCE AND VITICULTURE”  
Branch of knowledge “Agriculture and forestry”**

**Form of training, licensed number of students:**

– full-time 50

– correspondence 30

**Term of study** 1,5 years

**Credits** 90 ECTS

**Language of teaching** Ukrainian, Russian

**Qualification of graduates** researcher in horticulture and viticulture

**The concept of training**

Preparation of Masters at the Faculty of Agronomy SB NUL&ES of Ukraine “CATU” is held since 2002. Faculty organizes and coordinates the educational process aimed at training professionals with knowledge of modern production technologies, storage and initial processing of crop production, horticulture and viticulture, cultivation of fruit, berries and grapes, plant protection system and agrochemical providing modern technological processes in crop production, horticulture, horticulture and viticulture and carries cultural and educational work among the students.

The organization of the educational process for students of master includes production and research specializations for each specialty. It allows graduates to have sufficient theoretical and practical training work in agricultural enterprises specializing in the production, storage and processing of crop production, horticulture and viticulture production, or academic institutions that specialize in dealing with scientific issues in agronomy, agroinformation technologies and systems, horticulture and viticulture, plant breeding and genetics of crops, plant protection or continue their education in postgraduate study.

**Production oriented master program**

***Master program “Varietal technologies in viticulture”***

The modern state of viticulture and analysis of technologies of viniculture are studied in the economies of different patterns of ownership; unconventional technologies of growing of nursery transplants of vine.

***Master program “Modern production technologies of fruits and berries in the south of Ukraine”***

Modern technologies are studied in gardening (the use of the newest sorts, methods of adjusting of the fruit loading is on undersized plants, use of biologically-active substances for the increase of the productivity and firmness to the unfavorable factors of environment), results what ability with high exactness to program and forecast the harvest of the fruit planting must become.

***Master program “Modern production technologies in vegetable growing of an open ground”***

World experience is studied in the vegetable-growing of an open ground, modern high quality technologies of growing and seed-grower of vegetables, potato, water-melon cultures on the south of Ukraine.

### **Sphere of graduates employment**

According to the obtained qualification master-graduates on specialty "Fruit and Vegetable Science and Viticulture" can occupy the following positions: chief agronomist, head of subsistence agriculture, crew chief, director (manager) of small agricultural enterprises, a research agronomist, researcher in horticulture and viticulture, junior researcher (agronomy), researcher (agronomy), researcher and consultant (agronomy), agronomist, agronomist with the seed, plant protection agronomist, agronomist-inspector, a professional with Horticulture and viticulture, agricultural advisers, agricultural expert advisor.

Employment of graduates takes place in agricultural enterprises of different ownership, the State Veterinary and Phytosanitary Service, research institutions and NAAS of Ukraine National Academy of Sciences of Ukraine, state nature reserves, sanctuaries, regional and district agroestablishments, advanced agricultural farms, etc.

### **Research oriented master program**

#### ***Master Program "Scientific and innovation work in viticulture"***

The agrobiological characteristic of new grades of grapes is studied and the modern technology of their cultivation is developed. Technology on energy- and resource-saving is developed.

#### ***Master Program "Scientific and innovation work in gardening"***

The modern methods of an experience work are studied with fruit and berry plants, and also the newest foreign and home experience of creation of the high-performance fruit and berry planting and their introduction in production.

#### ***Master Program "Scientific and innovation work in vegetable growing of an open ground"***

The methods of researches are studied in the vegetable-growing of open soil and closed soil, planning and realization of researches in a seed-grower and selection of sorts of heterotic hybrids and water-melon cultures.

### **Sphere of graduates employment**

Enter in postgraduate study of NUL&ES of Ukraine, other educational institutions, research institutions NAS of Ukraine and NAAS of Ukraine.

### **Practical training**

The bases of practical training for graduate students on specialty "Fruit and Vegetable Science and Viticulture" are: firm "Chernomorets" TDG "Maharach", JSC "Burluk", LLC "Gardens of Taurida" Bakhchisaray district, LNG "Emerald", PCG "Zarya", QFT "Djankoi" Dzhankovsky district; NNTRTS SB NUL&ES of Ukraine "CATU", R-with "Zavetnoe" JV "Krymteplitsa", Agricultural Farm "Pryhorodnoe", Avot "Soviet Ukraine" Simferopol region, P-with them. P. Osipenko, R-with them. S. Perovskoy, R-with "Kaczynski" R-from "Gardener", AASO "Sevastopol" Sevastopol administrative area, SPH them. Kalinin, JSC "Crimean Fruit Company" KNDTSP, EPH "Peace" Krasnogvardiyskiy area, JSC "Pobeda", JSC "Spring" Nizhnogirskiy plodorozsadyk Nizhnegorskiy district, plants "Alushta", "Pike", "Tauris", "Sun Valley", Training Mountain Horticultural Research Station in the village Foros on the territory of south coast of Crimea.

### **Proposed Topics for Master Theses**

1. Improvement of cultivation technology and technical grades of grapes.
  2. Development of energy- and resource-saving in grape nursery.
-

**MASTER DEGREE PROGRAMS**

3. Estimation of new varieties of fruit and berry crops in different conditions of southern Ukraine.
4. Modern methods of growing stock.
5. Efficiency of stock varieties combinations of grapes.
6. Improving technologies of planting material of grapes.
7. Create high planting fruit crops.
8. Create high planting berry crops.
9. Using modern methods of reproduction of fruit species.
10. Scientific rationale and development of high-grade technology in open ground vegetable and melon.
11. Agrobiological estimation of early ripening varieties of melons in the steppe zone of Crimea.

**Academic rights of applicants for a master program**

In addition to the specialty “Fruit and Vegetable Science and Viticulture” Applicants with a bachelor’s degree in the direction of “Agriculture” can continue studying the field of knowledge **“Agriculture and Forestry”**:

- 8.09010101 – Agronomy (see p. 19 );
- 8.09010102 – Agrochemistry and Soil Science (see p. 41);
- 8.09010105 – Selection and Genetics of Agricultural Crops (see p. 51)

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Fruit and Vegetable Science and Viticulture”**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Management Psychology	3	72	1,3	2,0
2	Agribusiness and Marketing in gardening, horticulture and viticulture	2	72	1,3	2,0
3	Fundamentals of Agricultural Consulting	3	72	1,3	2,0
4	Stock exchange business	2	72	1,3	2,0
5	Computer technology in gardening, horticulture and viticulture	1	72	1,3	2,0
6	Business Foreign Language	1	72	1,3	2,0
7	Civil protection	3	36	0,7	1,0
<i>Total number</i>			<i>468</i>	<i>8,7</i>	<i>13,0</i>
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Applied Genetics to the basics of Cytology	1	108	2,0	3,0
2	Biochemistry of fruits, vegetables and grapes	1	108	2,0	3,0
3	Biotechnology	1	108	2,0	3,0
<i>Total number</i>			<i>324</i>	<i>6,0</i>	<i>9,0</i>
<i>1.3. Cycle of professional and practical training*</i>					
1	Methods of Research in Horticulture case using PC	3	108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				national	ECTS
2	Global agricultural technologies in horticulture, horticulture and viticulture	2	162	3,0	4,5
3	Labor protection in industry	1	72	1,3	2,0
4	Fundamentals of Geographic Information Systems	3	144	2,6	4,0
<i>Total number</i>			486	8,9	13,5
Total according to regulatory part			1278	17,6	35,5
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of humanitarian, social and economic training*					
Production oriented disciplines					
1	Philosophy of Science	1	72	1,3	2,0
2	Agricultural and Environmental Law	1	72	1,3	2,0
3	Strategy of sustainable development of nature and society	1	36	0,7	1,0
<i>Total number</i>			180	3,3	5,0
2.1.2. Cycle of professional and practical training*					
1	Modern technologies of fruits, vegetables and grapes	3	108	2,0	3,0
2	Modern technologies in viticulture	2	108	2,0	3,0
3	Innovative Vegetable and mushroom plants in constructions of the closed soil	3	72	1,3	2,0
4	International standards and certification technologies, raw materials and finished goods	1	54	1,0	1,5
5	Resource-saving technologies in viticulture and grape nursery	3	108	2,0	3,0
6	Modern varietal technologies in horticulture	2	180	3,3	5,0
7	Varietal technologies in open ground vegetable and melon	2	108	2,0	3,0
<i>Total number</i>			738	13,7	20,5
<i>Total chosen by university</i>			918	17,0	25,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training*					
Production oriented disciplines					
Master program "Varietal technologies in viticulture"					
1	Highly productive grape growing in farms of different organizational forms	2	198	3,7	5,5
2	Nonconventional technologies in viticulture	3	126	2,3	3,5
<i>Total selected by the students</i>			324	6,0	9,0
Master program "Modern technology of fruits and berries in southern Ukraine"					
1	Modern technologies propagation of fruit plants	3	108	2,0	3,0
2	Physiological substantiation of methods of growing crops in horticulture	2	108	2,0	3,0
3	Forecasting and programming of crops	3	108	2,0	3,0
<i>Total selected by the students</i>			324	6,0	9,0
Master program "Modern technology in vegetable open field"					
1	Organic vegetable and potato	3	108	2,0	3,0
2	Vegetable crops in the decorative construction	2	72	1,3	2,0
3	Gourds in southern Ukraine	2	72	1,3	2,0
4	Seeds of vegetables, melons and potatoes	3	72	1,3	2,0
<i>Total selected by the students</i>			324	6,0	9,0
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional and practical training*					
Research oriented disciplines					
1	Planning and organization of research in vegetable of open and closed ground	3	108	2,0	3,0
2	Planning and organization of research in plant	3	108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				national	ECTS
	breeding and seed varieties and hybrids heterozisnyh vegetables and melons				
3	Planning and organization of research in technology storage and processing of fruits and vegetables	3	108	2,0	3,0
4	Research in horticulture	3	72	1,3	2,0
5	Natural-resource potential and gardening in Crimea	3	108	2,0	3,0
6	Conduct agronomic experiments in viticulture	3	108	2,0	3,0
7	Grape Varieties and balanced technology of growing grapes	3	108	2,0	3,0
<i>Total chosen by university</i>			720	13,3	20,0
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training*					
Research oriented disciplines					
Master Program "Research and innovation work in viticulture"					
1	Scientific support of grape growing in extreme conditions	3	126	2,3	3,5
2	Energy- and resource-saving technology in grape nursery	3	126	2,3	3,5
3	Modern technologies in reconstruction of vineyards	3	72	1,3	2,0
<i>Total selected by the students</i>			324	6,0	9,0
Master Program "Research and innovation work in horticulture"					
1	Modern Methods in Fruit Breeding	3	72	1,3	2,0
2	Modern methods of introduction to horticulture	3	108	2,0	3,0
3	New technologies in growing rootstocks	3	72	1,3	2,0
4	Physiological basis of performance agroecology	3	72	1,3	2,0
<i>Total selected by the students</i>			324	6,0	9,0
Master Program "Research and innovation work in open ground vegetable"					
1	World range and scientific justification for the introduction of new vegetable crops	3	108	2,0	3,0
2	Research and innovation work in open ground vegetable	3	108	2,0	3,0
3	Programming and prediction of harvest vegetables	3	108	2,0	3,0
<i>Total selected by the students</i>			324	6,0	9,0
Total number of elected part			1242	23,0	34,5
Practical training			360	6,7	10,0
Writing and defense of master's thesis			360	6,7	10,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. Cycle of humanitarian, social and economic training\*

**Psychology of Management.** To receive knowledge and skills to analyze psychological conditions and characteristics of management and their application in modern practice management. Complex psychological problems of human interactions and relationships within their shared social and purposeful activity.

**Agribusiness and Marketing in gardening horticulture and viticulture.** The study of the theoretical foundations and practical skills of agribusiness and marketing in gardening, horticulture and viticulture. Economic and administrative matters arising in the agribusiness, and implementation of market research.

**Fundamentals of Agricultural Consulting.** Organization and trends in information and advisory services, communication process and modern information technology in the advisory services. Methods of consulting activities, ethics, aesthetics in the work of consultants, types of information and consultancy services.

**Stock exchanges.** Status and trends of the stock market, the features of exchange operations and specific features of the exchange of goods, economic and administrative matters arising in the course of pre-sales and sales of commodities on the stock exchange with the use of intermediaries.

**Computer technology in gardening, horticulture and viticulture.** Modern computer technology and its tools. Connection of computer technology with information systems. Types of information systems. Methods of storing and using large amounts of structured information. Database monitoring and examination findings. Using a spreadsheet to solve professional problems. Methodology and technology to analyze data. Using different methods of forecasting for the industry, methods of decision making.

**Business foreign language.** Complex learning the language on profession. Types of language: reading, listening, speaking. The skills of dialogue and monologue speech and to prepare students for professional communication orally and in writing in a foreign language. Learn how to translate specialized texts as a means of adequately presenting the content of scientific information. Formation of the knowledge and skills necessary to ensure communicative ability in the field of professional communication: in particular, the ability to organize and conduct a scientific conference in the specialty, to participate in the conference and to make a scientific report, a business meeting or negotiations with foreign counterparts and partners.

**Civil protection.** Implemented theoretical and practical training of students on the protection of workers in the economy, study ways and means of improving the organization and rescue and other emergency operations while managing accidents, natural disasters and lesions associated with the effect of weapons of mass destruction .

### *1.2. Cycle of natural science (fundamental) training\**

**Applied Genetics Cytology of the basics.** Discipline enables students to broaden knowledge and practical skills in basic and applied fields of genetics and cytology. Key topics include learning activities as general aspects of mendeleev, molecular, population genetics and genetics of development and the organization and function of cellular structures and specialized aspects – and Antimutagenesis mutagenesis, aging, mating systems in plants, double fertilization in angiosperms, self-incompatibility, self-fertilization, dvodomnosti and apomixis in plant polyploids, heterosis major genetic systems, modern genetic techniques used in agriculture, scientific research and genetic engineering.

**Biochemistry of fruit, vegetables and grapes.** Biochemistry includes general and special parts. General characteristics of the introduced protein, carbohydrates, fats, vitamins, minerals, enzymes and basic biochemical processes occurring in fruits and vegetables. Special parts include material on basic biochemical composition of fruits and vegetables, and changing it during storage and processing.

**Biotechnology.** Theoretical and practical problems of biotechnology crops. Cultivation of isolated cells and tissues. Morphogenesis and regeneration in cultured cells and tissues of plants. The concept of totypotentnist of plant cell. Introduction of tissues and cells in culture in vitro. Optimization of culture media. Using of microclonal reproduction, somoklonalnoyi variation, cell selection, embryo culture, anther, seed germs to build new plant forms. Genetic Engineering.

### *1.3. Cycle of professional and practical training\**

**Methods of Research in Horticulture case using PC.** Planning research methods for conducting experiments and processing of results, applications of computer technology



in the whole complex of scientific process of planning the experiment to provide recommendations or techniques of growing fruits and vegetables, storage and processing.

**Global agricultural technologies in horticulture, horticulture and viticulture.** The study of the condition and prospects of the global vegetable and fruit growing in Ukraine and abroad, their trends and directions. Modern science-based technology for growing high-quality planting material. Growing high-quality commercial harvest fruit and vegetable crops to produce environmentally safe products with minimal labor inputs in different soil-climatic zones of Ukraine. Organization of conveyor high-vitamin fresh commodity products throughout the year. Biased economic system in Europe, Asia and America.

**Labor protection in industry.** Theory of safety in agriculture. Organizational principles of health and safety in agriculture. Current methods for determining the parameters of industrial hygiene factors in agriculture. Arrangements and hardware security in the performance of production processes in agriculture. Assessing the impact of safety measures for the environment. Preventive measures to avoid injuries and accidents.

**Fundamentals of geographic information systems.** The concept of geographical information system. Structure and algorithm in processing geographical information system. Application databases of geographic information system. Making the decisions according to the geographical information system. Global applying of GIS to the environment.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of humanitarian, social and economic training\*

##### *Production oriented disciplines*

**Philosophy of Science.** The philosophical and scientific approaches to the study of science and innovation. Philosophy of science: ontological, epistemological, epistemological dimension. Forms of organization science. Classical, non-classical ideals of scholarship and postnonclassical. Methodology of scientific knowledge and innovation. Study of basic scientific form. The value of basic and applied research strategies. Philosophical Foundations in classification of sciences. Philosophy of technology: theoretical and methodological aspects. Philosophical understanding of scientific world. The logic of scientific research in the context of global challenges.

**Agricultural and environmental law.** Subject of agricultural and environmental law, their principles and systems, sources of agricultural and environmental law, its concepts and classification, agrarian relations (concepts, types, characteristics, classification) state regulation of agriculture (content, form, system of government, etc.); legal Status of different Agricultural types (farmers, agricultural cooperatives, private farms), especially the reform of agriculture policy.

**Strategy of sustainable development of nature and society.** It generates knowledge of the principles and strategies of sustainable development as a harmonious process, which ensures sustainable economic convergence, promotes environmental ecological culture, preservation of natural resources, ensures Biosphere space and environmental safety to meet the needs of human life. Learn provision of practical implementation mechanisms, coordination and harmonization of social, economic and environmental sustainable society in the country, organizes plans and timing of stages of the objectives of sustainable development. Promotes mastery and skills monitoring of indicators of sustainable development, identifying environmental risks and hazards for human development and sustainable development, the use of international agreements and documents related to sustainable development, development plans and programs during the transition to sustainable development of Ukraine and other countries in transition.

*2.1.2. Cycle of professional and practical training\**

**Modern technologies of vegetables, fruit and grapes.** It consists in studying the technological characteristics of fruit, berries, vegetables and grapes and optimal directions for their use, study quality of canned fruits and vegetables. It deals with the basic processes of fruits and vegetables by heat sterilization, drying, freezing, canning biochemical methods.

**Modern technologies in viticulture.** The subject is to examine students: the formation of buds fruitfulness of indigenous varieties, varieties with resistance group in the new varieties, varietal grape growing farming for different varieties and crop use directions.

**Innovative Vegetable and mushroom production in plants under glass.** The subject has to develop modern methods of establishing and regulating of microclimate based on phytomonitoring and characteristics of power plants in the greenhouse structures.

**International standardization, certification, technology, raw materials and finished products.** To study the basic principles of international and regional organizations for standardization and certification of agricultural products, their structures and services, duties and rights, fundamental provisions of international and European legislation in the field of standardization and certification.

**Resource-saving technologies in viticulture and grape nursery.** Subject discipline is to explore by students the basics of natural heat source for passing the basic physiological processes in reproduction grapes, techniques for resource conservation in reproduction grapes, grape organizational structure of modern nursery that uses energy and resource-saving technology.

**Modern high-quality technology in horticulture.** Subject is to explore the scientific basis and practical ways to grow fruit and berry plants according to their varietal characteristics on the basis of today's advanced technologies.

**Varietal technologies in open ground vegetable and melon.** Discipline is studying biology and breeding technology of high and environmentally acceptable yields of new varieties and hybrids of vegetable crops with minimal labor and capital. It deals with the selection of varieties and hybrids, vegetable and melon crops, methods of cultivation for conveyor revenue yield.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional and practical training \**

*Production oriented disciplines*

**Master program “Varietal technologies in viticulture”**

**Highly productive grape growing in farms of different organizational forms.** Subject discipline is to select varieties and forms of shrubs to grow grapes on summerhouses and balconies, in gardens, suburban land plots and farms in developing technology for growing grapes in greenhouses, to learn the basics, methods and techniques of viticulture in northern Ukraine as it addresses issues associated with the selection of varieties and rootstocks for these areas of grape growing in the studied technologies of growing grapes at different ways of gardening, and greenhouses, winter gardens.

**Nonconventional technologies in viticulture.** Subject is to study the biological basis of students' use of various alternative technologies in grape breeding, study of anatomy and physiology grafting grapes as the basis for the use of various innovative technologies of reproduction grapes, students study the organizational structure of modern grape nursery that uses innovative technology.

---

**Master program “Modern technology of fruits and berries in southern Ukraine”**

**Modern technologies propagation of fruit plants.** Subject is to explore the technologies of grafted seedlings with crown; acquainted with the technology of growing plants with closed root system, learning the basics of the use of growth regulators and adapt gens in the nursery.

**Physiological study techniques of growing crops in horticulture.** Subject: Implementation of the genetic program of plant ontogenesis, depending fundamental life processes of plants from the external environment and the possibility to manage processes of growth, development and the formation of plant resistance due to changes in the external environment farming practices, production process management features in agrophytocenoses as artificial systems for solar energy development and accumulation it in a modified form in the crop.

**Forecasting and programming yields.** Subject is to explore the fundamentals of programming and forecasting crop of fruit and berry plants, fruit species requirements to major environmental factors that affect the growth and productivity of fruit and berry plants methodological features of forecasting and programming yields of fruit and berry plants.

**Master program “Modern technology in vegetable growing in the open field”**

**Organic vegetable and potato.** The subject: the development of methods of planning and development of technology of cultivation of ecologically pure vegetable and potato in Southern Ukraine.

**Vegetable crops in the decorative construction.** Subject: the subject is the scientific discipline that studies the biological characteristics of vegetable ornamental plants, classification and agricultural technologies of vegetable and spicy-flavoring plant in an open and protected ground, the basic principles of composition decorative vegetable plants: flower beds, flower beds and decorative fences.

**Gourds in southern Ukraine.** The subject is oriented on the development of classification, morphology, biological patterns of growth and development and requirements melons to environmental conditions. The technology of melons growing in closed buildings and open field is studied in it.

**Seeds of vegetables, melons and potatoes.** The subject is the study of the basic elements of the seeds in seed plants.

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of humanitarian, social and economic training \**

*Research oriented disciplines*

**Planning and organization of research in vegetable of open and closed ground.** Features research in vegetable open and protected ground, organization, foundation and conducting field experiments with vegetable crops, methods of scientific work, the formation of scientific documentation and reporting.

**Planning and organization of research in plant breeding and seed varieties and hetaeristic hybrids of vegetables and melons.** Discipline examines the theoretical knowledge and practical skills in organization studies obtaining varieties heterosis hybrids of vegetables and melons, and biological characteristics of vegetable plants to develop agricultural technologies of the highly promising seed varieties.

**Planning and organization of research in storage technology and processing of fruits and vegetables.** The discipline studies methods of research for storage and processing of vegetables and fruits, including a plan of research methods accommodation options and technology experiment allowing for the object of study: potato tubers, vegetables, fruits, berries and grapes. We consider methods for determining the

---

organoleptic and biochemical parameters, damaging diseases, physiological disorders, weight loss.

**Research in horticulture.** Modern methods of collection and processing of materials received in horticulture research, planning studies with fruit and berry plants, making experiments in nature, collecting experimental data, their systematic, statistical analysis and improvement.

**Natural resource potential and gardening of Crimea.** Ecological conditions of cultivation of fruit and berry crops in Crimea, modern technology operation of industrial plants species of fruit and berry crops in different climatic zones of Crimea, selection of technology for using plants under specific soil and climatic conditions of the economy.

**Carrying out agronomic experiments in viticulture.** The subject of the discipline is to explore students' forms of research used in viticulture, the scheduling experiment to study stress vines eyes and length of fruit crop in determining the best form of bush vine vineyard to natural area; conduct special censuses and observations on experimental plots; agrobiological evaluation of research in viticulture.

**Grape Varieties and Balanced technology for growing grapes.** The subject: is the study by the students the balanced technology allocation of vineyards based on biological characteristics of varieties, the constituent elements of adaptive assessment to specific climatic conditions.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical training \**

#### *Research oriented disciplines*

#### **Master Program “Research and innovation work in viticulture”**

**Scientific support of grape growing in extreme conditions.** Grape growing in connection with damage to vineyards with frost, small frosts, hail and drought in different climatic conditions of Ukraine.

**Energy and resource saving technologies in grape nursery.** Progressive flow diagrams and elements of vine propagating material for modern energy and resource-saving technologies, new energy sources and materials, production technology, depending on how vaccinations stratification and quenching grape scions.

**Modern technologies on reconstruction of vineyards.** Progressive reconstruction and rehabilitation measures for vineyards. Innovative use of new generation root controllers reconstruction with vineyards.

#### **Master Program “Research and innovation work in horticulture”**

**Modern methods of plant breeding in gardening.** Basic methods of modern selection process when received new varieties and clones of fruit and berry crops, methods of selection of breeding material for constructing varieties of fruit and decent crop, variety features of certain fruit and berry crops, major donors agronomic traits in fruit and berry species that can be used to create new varieties.

**Modern methods of introduction to gardening.** Major domestic and foreign species of fruit and berry crops introduced varieties, describing and testing varieties, international standards in classification of breeds and varieties of fruit crops.

**The latest technology for growing rootstocks.** New technologies of reproduction jiggling clone rootstocks; biological basis of clone rootstocks breeding the factors that influence the formation of adventitious roots on the stem; terms rooting clone rootstocks; rapid propagation of clone rootstocks grafting and tissue culture, use of clone rootstocks and varieties of slow-growing; prospects of seedlings insertion in modern gardens, insert rootstock for seeded and stone fruit species.

**Physiological basis of agroecosystem performance.** The subject study provides in-depth absorption of depending harvest fruit and berry species agroecosystem intensity of photosynthesis, leaf area background and lighting conditions, temperature, moisture, farming techniques.

**Master Program “Research and innovation work in open ground of vegetable”**

**Global range and scientific basis of introduction of new vegetable crops.**

Discipline is studying the development of advanced technologies for growing vegetables in the open and protected ground in Western countries for provision of high-quality food and processing industry with raw materials.

**Scientific and innovative work in vegetable growing of the open ground.** The main features of research in vegetable growing of the open ground, innovative technology in growing nightshade, pumpkin, onion, cabbage and root crops, economic evaluation of the effectiveness of their production

**Programming and prediction of harvest vegetables.** Prediction and forecasting crop of vegetables, photosynthetic active reaction, its role in the formation of the crop, a crop with optimum growth of leaf area code, of the daily rates of net photosynthesis productivity, heat as part of the solar radiation, the sum of average daily temperatures, the development of science-based application of fertilizers in crop rotations methods of calculating the norms of fertilizers in crop rotations with high and limited availability of crop fertilizers.

---

**Master Training**  
**in specialty “LAND MANAGEMENT AND CADASTRE”**  
**Branch of knowledge “Geodesy, cartography and land management”**

**Form of training, licensed number of students:**

– full-time	20
<b>Term of training</b>	<b>1,5 years</b>
<b>Credits</b>	<b>90 ECTS</b>
<b>Language of teaching</b>	<b>Russian, Ukrainian, English, German</b>
<b>Qualification of graduates</b>	<b>the master of land management and a cadastre</b>

**The concept of training**

The main features of the organization of teaching and educational process for master's degree students consist of existence of industrial specialization on a specialty. This allows graduates to be ready for practical activities in the field of land management and cadastre, or in the scientific institutions specializing on the solution of scientific questions of geoinformation technology and systems, land management and cadastre or to continue studying in postgraduate study.

**Production oriented master program**

***Master program “Management of land resources, land market, land economics”***

The analysis of the condition of land resources system management, the direction of their development based on ecological branches, the solution of land protection problems, land management maintenance of an effective use of land.

**Sphere of graduates employment**

Land manager engineer, on the post of the expert, the senior expert in regional and city departments of land resources, regional and city departments (centers) of land cadastre, design institutes of land management, design industrial research institutes, in service of department of a geodesy and cartography, in regional and city bureaus of technical inventory, the private enterprises connected with survey and land management, cadastral engineer and land manager, real estate expert, sale agent of land and real estate, expert of land relations, registrar of land and real estate, engineer of city cadastre, engineer of land cadastre, engineer of forest cadastre, engineer of water cadastre.

**Practical training**

Republican Committee on Land Resources of Crimea and its departments in areas, the State enterprise “Crimean Scientific Research and Design Institute of Land Management”, the Crimean branch of the State enterprise “Center of the state land cadastre”, the State enterprise the Ukrainian state institute on designing of gardens and vineyards “Ukrdiprosad”, the industrial and scientific enterprises of different ownership of Crimea are the bases of practical training of master's degree students on speciality “Land management and a cadastre”.

### Proposed Topics for Master Theses

1. The analysis of a status and improvement of ways of management by land resources.
2. Ameliorative organisation of territories on the basis of the analysis of soils condition using the data of Remote sensing of lands.
3. Design of projects of the organisation of territory (agro enterprises) of Crimea based on bioresource potential of lands.
4. Scientific and technical support of cadastre of engineering communications of a city.
5. Forecasting changes in the quality of the soil based on analysis of the dynamics of their degradation.
6. Improvement of technology of cadastral surveys on an example.
7. Economic efficiency and estimation of reorganisation of agricultural lands on the Crimean territory (agro enterprise).
8. Scientific substantiation of the organisation of environmentally safe land use (agro enterprise) on the territory of rural Council in area of Crimea.
9. Geoinformation support of territorial planning of rural settlement of Crimea with the creation of the village model.
10. Improvement of the organisation of territory (agro enterprise) in area of Crimea based on ecological and economic evaluation of agricultural land.

### Academic rights of applicants for a master program

In addition to the speciality "Land Management and Cadastre" Bachelors in a preparation direction "The Geodesy, cartography and land management" can continue studying on specialties in the **branch of knowledge 1801 "Specific categories"**:

- 8.18010010 – "Quality, standardization and certification", (see p.176);
- 8.18010021 – "Pedagogy of Higher School"(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – "Educational Institution Management" (see p. 427)

### Curriculum for specialist training of the educational and qualification level "Master" in specialty "Land management and a cadastre"

№	Discipline, practice	Semester	Amount		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Scientific Foreign language on speciality	1	54	1,0	1,5
2	Pedagogy of high school	2	36	0,7	1,0
3	Commercial and labour law	1	36	0,7	1,0
4	Physical Education	1	36	0,7	1,0
<i>Total number</i>			162	3,0	4,5
<i>1.2. Cycle of natural science (fundamental) training *</i>					
1	Licensing and patenting of scientific production	1	36	0,7	1,0
2	Information technology in research studies	1	72	1,3	2,0
3	Methodology and methods of research studies	1	36	0,7	1,0
4	Labour safety in branch	1	36	0,7	1,0
5	Civil protection	2	36	0,7	1,0
<i>Total number</i>			216	4,0	6,0
<i>1.3. Cycle of professional and practical training *</i>					
1	GIS in cadastral systems	2	144	2,7	4,0
2	Legislative Support for Cadastre of Real Estate	2	72	1,3	2,0
3	Monitoring and land protection	2	144	2,7	4,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Amount		
			hours	Credits	
				national	ECTS
4	Land Management	2	144	2,7	4,0
5	The legal process in land management	3	72	1,3	2,0
6	Organization of land management projects	1	108	2,0	3,0
7	Automation in land management	3	108	2,0	3,0
<i>Total number</i>			792	14,7	22,0
Total according to regulatory part			1170	21,7	32,5
<b>2. ELECTIVED ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professional and practical training*					
1	Philosophy of a science and innovative development	1	54	1,0	1,5
2	The international standardization and certification of technologies, raw materials and goods	1	54	1,0	1,5
3	Strategy of a sustainable development of the nature and society	1	36	0,7	1,0
4	Economics of land use and land management	1	108	2,0	3,0
5	Prediction of land use	3	108	2,0	3,0
6	Land and real estate market	2	90	1,7	2,5
7	Digital mapping	3	108	2,0	3,0
<i>Total chosen by university</i>			558,0	10,4	15,5
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional and practical training*					
Production oriented disciplines					
Master program "Management of land resources, land market, economics of land use"					
1	Scientific examination of projects of the territory organisation	3	72	1,3	2,0
2	Registration of the property rights on land	3	72	1,3	2,0
3	Expert assessment of land	3	72	1,3	2,0
4	Geodetic support of land operations	3	72	1,3	2,0
5	Land management examination	3	72	1,3	2,0
6	Environmental problems in land management	3	72	1,3	2,0
<i>Total selected by the students</i>			288	5,2	8,0
Total number of elected part			846	15,6	23,5
Practical training			972	18,0	27,0
Writing and defense of master's thesis			252	4,7	7,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1 Cycle of humanitarian, social and economic training\*

**Scientific Foreign language on speciality.** Complex training of professional language work. Types of language activities: reading, listening, talking. Formation of skills of dialogical and monologic speech and preparation of students for professional dialogue in the oral and written form in a foreign language. To master the translation of the specialized texts as the means of adequate presenting the content of scientific information. Communicative ability in professional communication. The ability to participate in the conference and to make the scientific report, to hold business meeting or negotiations with foreign colleagues and partners.

**Pedagogy of high school.** The main categories, pedagogics branches. Essence of processes of training and education. Didactics principles. Forms, methods, kinds and technologies of training. Features of teaching activity at the high school using the Bologna



System of Education. Basic concepts of pedagogy of high school, the concept of cognitive processes, learning process in higher education, the nature and structure of teachers in universities, managers of the learning process, their psychological content, didactic principles, theory of lectures in high school, organization of control for independent extracurricular activity of students.

**Commercial and labour law.** The Subject of regulation of the commercial law. Commercial relations, their characteristics and types. Methods of commercial law. Main principles of the labour law of Ukraine. Labour law sources. Subjects of the labour law. Collective agreement. Labour relations. Legal organisation of employment of citizens.

**Physical Education.** The Basis of a healthy way of life. Estimation methods of condition of physical health and physical fitness of students. Theoretical and methodological foundations of healthy training. Preparatory and renewable forms of physical activity. Methods of improving functionality, level of the physical condition of the body. Fundamentals technique of chosen complex of physical exercises.

### *1.2 Cycle of natural science (fundamental) training\**

**Licensing and patenting of scientific production.** Classification of licence agreements. Sale and purchase of licences. The price of licences. Royalties. Procedure and patenting the property. Business secrets and the organisation of their protection. The Legislation of Ukraine on licensing and patenting.

**Information technology in research studies.** Network technologies for collecting and disseminating information. Mastering of the data in predicting models. Packages of processing and graphic imagination. Use of geoinformation systems and specialized databases. Drawing up programs. Use of information technology in the development of current land relations.

**Methodology and methods of research studies.** Content and principles of research in land management and cadastre. The program and methodology of scientific research in land management and cadastre. The scientific report. Implementation of research results in land surveying and agricultural production.

**Labour safety in branch.** Basic theory of safety of work. The legal and organizational bases of a labour safety. Protective measures in land management. Ensure safe working conditions during field and office surveying work. Providing first aid to victims.

**Civil protection.** Emergencies, situation estimation, population protection, stability, liquidation of consequences. The legal framework of civil protection. Behaviour rules at occurrence of emergency situations. The bases of management of evacuation of people, livestock and material assets.

### *1.3. Cycle of professional and practical training\**

**GIS in cadastral systems.** Theoretical capabilities and practical use of geoinformation technology in the cadastral registration system. Modeling types and kinds of land use. Use of GIS-packages and software of data processing of remote sensing data for management in departments of the state land cadastre. Levels of processing of the cadastral data. Use of GIS-technologies and systems in modern surveying and cadastre production. Use of GIS tools and methods in creation of cadastral systems to control the management of land resources.

**Legislative Support for Cadastre of Real Estate.** Value of cadastre of real estate for economy of Ukraine in a context of the European experience. The state registration of the rights to real estate and their limitations. Mortgage of land. Legislative base on management of cadastre of real estate for effective management of the state land cadastre.

**Monitoring and land protection.** Remote sensing methods for land resources. Use of satellite imagery for land monitoring. Classification of images. Digital mapping

---

database. Methodology and a technique of prediction of land management, mapping and cadastral work. Creation of thematic maps of a soil cover, parameters of quality and fertility of soil, development of erosive and other degradation processes.

**Land Management.** Methodical foundations of management of use and protection of land and conformity of their development. Dynamics of changes in land policy and its impact on the organization of land use and protection. Means and methods for management of land resources. Elements of regulation of land relations at the national, regional and base levels. Powers of state structures and local governments in sphere of control of land use.

**The legal process in land management.** Conceptual framework of land legislation. State regulation in sphere of reforming land relations, land management, management of the state land cadaster, protection and land monitoring.

**Organization of land management projects.** The essence and foundation of management: systems, functions and management methods, organizational structure of management, organization of work and quality management of activities. Management, organization, planning. Financing, accounting and reporting in design in surveying organizations of different ownership. Control and estimation of work quality.

**Automation in land management.** Use of electronic geodetic devices and mechanisms, modern computer technologies. Types and kinds of electronic computer facilities. Use of GIS as a spatial framework for the design. The Automation of surveying work. Information preservation, its actualisation and reuse in land management designing.

## 2. SELECTED EDUCATIONAL DISCIPLINES

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional and practical training\**

**Philosophy of a science and innovative development.** The concept of science. Knowledge, types of knowledge. Specific character of scientific knowledge. Structure and dynamics of science. Science and philosophy, their relationships in history. Science in the philosophy. The main methods in science development: scientific hypothesis, experiment, observation. Relations of empirical and theoretical levels of cognition. Main areas and schools of philosophy of science. The problem of a substantiation of knowledge and criterion of the validity of knowledge. Kinds of methods and their characteristic: induction, deduction, analysis, synthesis, analogy, modelling, abstraction, idealisation; axiological and hypothetico, deductive method. Empirical and theoretical methods, their relationship.

**The international standardization and certification of technologies, raw materials and goods.** The international organisation for standardization. The international electrotechnical commission. The European economic commission of the United Nations. The food and agricultural organisations of the United Nations. Harmonisation of standards. Regional Organization for Standardization. European Committee for Standardization. EU activity for standardization. Inter-Scandinavian organization for standardization. International certification and quality management at the international and regional levels. Certification in Russia, USA, Germany, France and Japan.

**Strategy of sustainable development of nature and society.** Strategy of a sustainable development of the nature and society. Problems of interaction of people and environment, the main concepts of principles of strategy of a sustainable development of a society, the concept of the biosphere as a dynamic system, basic information about global environmental problems of humanity - resources and development, anthropogenic effect on the biosphere. Criteria of stability of socio-ecological systems, systems of balanced development of natural and anthropogenic complexes and situational modelling of society development, economic, socio-political, ecological and ethical problems of development, problems of acceptance of management decisions.

**Economics of land use and land management.** Theoretical foundations of Economics of land management. Economic theories and concepts which make the basis of economy of land management. The bases of the theory of economic efficiency of land management. Methodology of an estimation of economic efficiency of land management and land use. Methods of substantiation of land management solutions. Definition methodology of efficiency of land management using methods of mathematical analysis. Economy of territorial and local land management. The estimation of investment projects of land management.

**Prediction of land use.** Theoretical basis of predictive activity. Prediction: terms and definitions; the structurally-logic scheme of prediction. Classification of predictions. Principles and methods of predictions . Features of predictions of condition and use of land. Planning of use of the land at state, regional and local levels in the management of land resources. Development of technological scheme of prediction use of land. Selection of criteria, methods and implementation of an estimation of land conditions. Statistical methods of prediction of land condition. Working out the plan of land utilization.

**Land and real estate market.** The economic and legal foundation for real estate markets in the conditions of market economy. Theoretical foundations of market formation mechanisms. Supply and demand interaction. Real estate classification. Methods of market segmentation. The market value of real estate and land. . Principles of formation of cost. Risks and their quantitative analysis on real estate market. Methods for determining the market value of land and real estate.

**Digital mapping.** Digital cartography. General technology of creation of digital maps. Requirements for the process of creation and updating digital district maps and rules of digital writing of the mapping information. Digital district maps correction, control and estimation of their quality. Spatial (three-dimensional) imagination of digital district maps and features of their creation. Creation of digital district maps using the complex program “Panorama”.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of professional and practical training\**

#### *Production oriented disciplines*

#### **Master program “Management of land resources, land market, economics of land use”**

**Scientific examination of projects of the territory organisation.** Scientific examination of territory organisation programs. Classification of expert examinations. Kinds of state expert examinations.. Expert methods of decision-making. Concept, problems and principles of scientific and technological examination. Subjects and objects of examination. Forms and kinds of scientific and technological examination. The rights and duties of the customer and the expert. Conclusions of scientific and technological examination. Implementation of the state land management expert examinations. State ecological expert examination. Examination of construction documents. Comprehensive state examination.

**Registration of the property rights on land.** History of occurrence and development of registration of tenures and land use. Fundamentals of registration of tenures and land use. Modern land relations in Ukraine and registration of land rights. Principles and methods of land registration. Legal framework and organizational support for land registration. Organisation of databases in the registration of tenures and land use. Role of registration of tenures and land use in the system of land resources management.

**Expert assessment of land.** Fundamentals of registration of tenures and land use. History of occurrence and development of land assessment. Modern land markets in Ukraine and. Legal fundamentals and organizational support of land registration. Principles

and methods of expert assessment of land. Methodological approaches to the expert assessment of land. Expert valuation of land plots.

**Geodetic support of land operations.** Geodetic support of land operations. Planning and cartographic materials, nomenclature. Requirements to accuracy of materials. Kinds of geodetic substantiation. Ways of obtaining the geodetic data. Ways for designing and carrying out of projects.

**Land management expertise.** Land management expert examination of land management projects. Classification of expertises. Kinds of state expertises. Expert methods in making decision. Concept, problems and principles of scientific and technological examination. Subjects and objects of expert examination. Forms and kinds of scientific and technological examination. The rights and duties of the customer and the expert. Conclusions of scientific and technological examination. Implementation of the state land management expert examination. State ecological expert examination. Examination of construction documents. Comprehensive state examination.

**Environmental problems in land management.** Analysis of Land Management designing from the point of view of the solution of environmental problems, the legal basis for the protection of the environment in land management, the main environmental problems of agriculture, urban and industrial systems, sociological technical ecosystem as an object of protection and management, directions of soils protection and environmental protection, implementation of land management activities, agroecological research, methods of obtaining ecological information, monitoring as a method of environment control, the composition and structure of the cadastral data bank, directions of environmental protection of Ukraine and Crimea with the use of land resources.

---

**Master Training  
in specialty “ECONOMICS OF ENTERPRISE”  
Branch of knowledge “Economy and Entrepreneurship”**

**Form of training, licensed number of students:**

– full-time 30

– correspondence 30

**Term of study** 1 year

**Credits** 60 ECTS

**Language of teaching** Ukrainian, Russian

**Qualification of graduates** master's degree in economy of enterprise

**The concept of training**

The master's program aims to train specialists in the area of management and administration to meet needs of the agroindustrial sector in the state, including agricultural enterprises of all forms of ownership and organizational forms, the field of land relations, providing highly qualified government, public organizations, other enterprises and organizations.

**Production oriented master program**

***Master program “Economics and Economic Analysis  
in agricultural enterprises”***

Master's program aims to extend the knowledge of the system analysis. Also it allows gaining knowledge of identifying internal reserves of material, labor and financial resources.

**Sphere of graduates employment**

Certificated Masters receive Master's qualification in middle and senior level of management at enterprises. The level of graduates gives them the opportunity to work in different entities of AR of Crimea, the state executive authorities, local governments, relevant departments and offices. The program provides both adequate training of future researchers, in particular, graduate, assistant professor, senior lecturer, researcher.

***Master program “Economy and economic analysis at the enterprises of agro-industrial complex”***

Master program allows obtaining the knowledge about the enterprises of agro-industrial complex. Special attention is given to the study and evaluation of grapes and wine production.

**Sphere of graduates employment**

Training and qualification of graduates on research specialization gives them access to employment at the Ministry of Agricultural Policy and Food of Ukraine and its territorial divisions, universities, academic and research institutions as academic staff.

***Master program “Economy of agriculture and rural areas”***

Master program allows obtaining the knowledge about the features of the rural areas in socio-economic development and business organization in the country. Special attention is given to the study of creation and support of effective business entity operation

in the country. It expands the understanding of the peculiarities of agricultural markets and pricing mechanism for agricultural products.

### **Sphere of graduates employment**

The training of agrarian direction economists ensures the need for staff in agricultural sector and rural social field. It is intended to prepare managers and entrepreneurs in agribusiness and rural services. The program provides adequate education of future researchers, namely postgraduate, assistant professor, senior teacher, researcher.

### **Research oriented master program**

#### ***Master program “Methods and Economic business entities”***

The master's program allows students carry out scientific and teaching activities. It provides the theoretical foundations assimilation of innovation entities and practical skills in their organization in market conditions. The program involves the study of agricultural enterprises organizational engineering.

### **Sphere of graduates employment**

Training and qualification of research specialization graduate gives them the opportunity to work with the Ministry of Agrarian Policy and Food of Ukraine and its territorial offices, universities, academic and research institutions in researchers' positions.

### **Practical training**

The amount of students' practical training for Master's degree of specialty “Economics of Enterprise” is 6 weeks, 4 of which – production practice and 2 weeks – teaching practice. Production practice in specialty provides practical skills in economic diagnosis and projects management in agricultural enterprises and organizations. Teaching practice involves mastering skills of teaching in higher education.

Practical training bases of in specialty include: State Enterprise “Training and Research Bird Breeding Plant by the name of Frunze NULES of Ukraine”, National state-owned industrial and agricultural association “Massandra”, “Drugba narodov” Ltd., State Enterprise “Agricultural firm “Magarach” National Institute of Vine and Wine “Magarach”, LLC “Osaviahim” and other works, as well as the structural units of the Ministry of Agriculture and food. The pedagogical practice basis is the Department of Economics and agricultural enterprises of the University.

### **Proposed Topics for Master Theses**

1. Economic efficiency of production and ways to improve it.
  2. Organization and prospects of production.
  3. Labor productivity and ways to improve it.
  5. Intensification of production and ways to improve it (in crop, livestock).
  6. Efficiency of land use and ways to improve it.
  7. Efficiency of labor resources use and ways to improve it.
  8. Optimization of resource potential in business use.
  9. Improvement of economic decision-making processes at the enterprise.
  10. Improving the functioning of the enterprise economic mechanism.
-

**MASTER DEGREE PROGRAMS**

**Academic rights of applicants for a master program**

In addition to “Economics of Enterprise” Bachelors can continue their education in specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Economics of Enterprise”**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of professional training*</i>					
1	Strategic management of business.	2	108	2,0	3,0
2	Financial Management.	1	108	2,0	3,0
3	Staff management.	2	108	2,0	3,0
4	International Management	2	108	2,0	3,0
5	Project Management	1	144	2,7	4,0
6	Business’ potential management.	1	144	2,7	4,0
7	Economic diagnostics	1	144	2,7	4,0
Total according to regulatory part			864	16,1	24,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional training*</i>					
1	Strategy of sustainable development of nature and society.	1	36	0,7	1,0
2	Philosophy of science and innovation.	1	54	1,0	1,5
3	International standardization and certification of technologies, raw materials and finished products.	1	54	1,0	1,5
4	Safety in the industry	2	36	0,7	1,0
5	Civil protection.	2	36	0,7	1,0
6	Methods of teaching in higher education.	1	72	1,3	2,0
7	Methods and organization of research	2	72	1,3	2,0
<i>Total chosen by university</i>			360	6,7	10,0
<i>2.2. Disciplines chosen by students</i>					
<i>2.2.1. Cycle of professional training *</i>					
Production oriented disciplines					
Master program "Economics and Economic Analysis at agricultural enterprises"					
1	Economic analysis of agricultural enterprises.	2	108	2,0	3,0
2	Business processes organization in agricultural enterprises.	2	72	1,3	2,0
3	State economic policy in the field of agriculture	2	108	2,0	3,0
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Economy and organization at enterprises of viticulture and wine-making sub-complex»					
1	Economy and organization at enterprises of viticulture and wine-making sub-complex	2	108	2,0	3,0
2	Basics of business and agribusiness in viticulture	2	72	1,3	2,0
3	Economic policy in the field of agriculture	2	108	2,0	3,0
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Economics of agricultural production and rural areas"					
1	The economy of agriculture and rural areas.	2	108	2,0	3
2	Markets and pricing in agriculture.	2	72	1,3	2
3	Economic policy in the field of agriculture	2	108	2,0	3

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				national	ECTS
<i>Total selected by the students</i>			288	5,3	8,0
Research oriented disciplines					
Master Program "Methods and organization of business entities economic activities"					
1	Innovative Economy	2	108	2,0	3,0
2	Economic evaluation of the effectiveness of the organizational structure of agricultural enterprises.	2	72	1,3	2,0
3	Economic policy in the field of agriculture	2	108	2,0	3,0
<i>Total selected by the students</i>			288	5,3	8,0
Total number of elected part			936	12,0	34,0
Practical training			324	6,0	9,0
Writing and defense of master's thesis			324	6,0	9,0
Total for specialty			2160	40,0	60,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of professional training\**

**Strategic management in business.** The strategic planning essence. The purpose in management. Strategic plans, projects and programs. Strategic management as implementation of targeted approach. Organizational support of strategic management and organizational changes in the management structure. Financial and economic mechanism to support the strategic management. Information and analytical support for strategic management.

**Financial Management.** Financial management and financial policy concepts of the enterprise. Organizational and informational support of financial management. Analysis in the financial management system. Control in the financial management system. Cash management. Business capital and profit management. Investment management. Financial risk Management. Tax management at the enterprise. Crisis financial management.

**Staff management.** The staff of the organization as an object of management. Management methodology. Resource maintenance of personnel management. Social and psychological aspects of personnel management. Personnel department and staff record keeping. Planning and formation of staff. Staff development. The movement of personnel. Adjustment of employment of staff. Creating favorable conditions. Evaluation of staff. Motivation and encouragement of staff. Social partnership in the organization. The effectiveness of management.

**International management.** The essence and characteristics of international management. Environment of international management. Strategic planning for international corporations. Decision-making in international corporations. Organizational development of international corporations. Human resource management in international corporations. Supervision and communication in international corporations. Control and reporting of international corporations. Technology policies for multinational corporations. Financial management of multinational corporations. Trading operations of international corporations. Investment operations of international corporations. Ethics and social responsibility of multinational corporations. Formation of global management.

**Project Management.** History and general principles of project management. Project management environment. Systematic approach to project management. Project analysis. Investment research and project financing. Integration management of project.



Content management of project. Time management of project. Cost management of project. Risk management of project.

**Business potential management.** Equipment and technical potential management of the enterprise. Management system to use and to form company labor potential. Crisis management system of the enterprise. Competitiveness potential management of business. Mechanisms and crisis response process.

**Economic diagnostics.** The object and purpose of the course. Diagnosis of enterprise's competitive environment. Competitiveness diagnosis. Competitiveness assessment. Enterprise evaluation as an integral property complex. Business' potential diagnostic. Managerial diagnosis. Financial diagnosis. Diagnosis economic security. Economic culture to diagnose an enterprise.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. *Disciplines chosen by University*

#### 2.1.1. *Cycle of professional training\**

**Strategy of constant development of nature and society.** Problems of interaction of people and environment, main concepts of the principles of strategy of development of society. Concepts of the biosphere as dynamic system. The main data on global environmental problems of mankind – resources and development. Anthropogenous influence on the biosphere. The criteria of firmness of social-and-ecological systems, economic, socio-political, environmental and ethic problems of development. Problems of adoption at administrative decisions.

**Philosophy of science and innovation.** The concept of science. Cognition, types of knowledge. The specificity of scientific knowledge. The structure and dynamics of science. Science and philosophy in the history of their relationship. The problem of coordination of scientific research. Classification of Aristotle science. Universities as centers of scientific knowledge. The formation of experimental science in the Renaissance. The main methods in the development of science: scientific hypothesis, experiment, observation. The ratio of the deductive, hypothetical-reductive and experimental methods in the science of modern times. The ratio of the empirical and theoretical level of knowledge. Place of Marxist dialectics in science XIX century. Major trends and schools of philosophy of science: the second wave of positivism, idealism, neo-dialectical materialism. The problem of justification of knowledge and criterion validity of knowledge. Popper's critical rationalism. The principle of falsification. Kinds of methods and their characteristics: induction, deduction, analysis, synthesis, analogy, modeling, abstraction, idealization, axiological and hypothetical, deductive method. Empirical and theoretical methods, their relationship.

**International standardization and certification of technologies, raw materials and obtained products.** The international organization of standardization. International electrotechnical commission. The European economic commission of the UN. Food and agricultural UN organizations. The commission "the Code Alimentarius" on development of standards on foodstuff, harmonization of standards. American national institute of standards and technologies. British institute of standards. German institute of standards. The French association on standardization. Japanese committee of industrial standards. The organization of works on standardization in the Russian Federation. The regional organizations on standardization. The European committee on standardization. Activities of EU for standardization. The Inter-Scandinavian organization on standardization. International association of the countries of South East Asia. Standardization in the Commonwealth of Independent States. The international certification and product quality control at the international and regional levels. Certification in Russia. A certification in the USA. A certification in Germany. A certification in France. A certification in Japan.

**Labor protection in the industry.** Traumatism and illness among workers. The traumatic factors. Dynamics of the traumatism and the analysis of its performance. The Labor Code. The control and management responsibility for ensuring of labor protection at the plants and objects. The structure of labor protection in industry and actions of government safety inspections. Labor protection service in the enterprise. Safety standards system (SSS). Concept and definitions of industrial hygiene. Industrial hygiene. Industrial sanitation and traumatism, and occupational diseases. Harmful and safety hazards factors in the workplace and work areas. Working conditions of employees. The concept and definition of noise. The vibrations and their harmful effects on humans. Factors and causes of traumatizing of the workers in the work processes and use of technology. Safety in the cultivation of crops. Safety at work on farm machinery, plant, combine harvesters, etc. Electric current and its effects on humans and animals. Procedures for investigating accidents and occupational diseases. Providing assistance to the victim. Structure of the commission and its formation. The order of investigation. Forms of acts "H-1". Documentation on the accident investigation. Education of workers for the protection of labor. Types of safety briefings: introductory, primary, at the workplace, repeated, unplanned and targeted.

**Civil protection.** Civil defense in modern conditions. Causes and classification of emergencies. Characterization of possible emergencies in Ukraine. Planning civil defense in the agricultural enterprise. Sustainability bases of agriculture in emergencies. Methods for assessing the sustainability of agricultural facilities, agricultural areas in emergency situations. Protect crops and livestock industries, machine and tractor fleet, fuel and energy, water facilities bases with the threat of an emergency.

**Methods of teaching in high school.** Two-cyclic training at high school; levels of graduates, professions, qualifications, specialties and directions; regulatory materials and legal framework of the Bologna system. Credit-module system with a point-rating estimation of results. Scale of assessment of knowledge and stimulating of learning elements. Key problems and concepts: ECTS credits, their value; module, meaningful module, block of modules, educational discipline, modular technology education, credit-modular system of educational process, training objects and training elements, independent work of the student and its methodological support, information package, learning contract, coordinators of ECTS; assessment of results a scale of ECTS; the learning complexity. Ensuring the quality of higher education: the criteria of the control within the university, national (state) and the European control of knowledge, criteria of competitiveness of the graduate. Assuring mobility of students, graduates, teachers, scientists and administrators. The criteria which guarantee mobility (the quality of higher education, the participants of the educational process, regulatory and legal framework). The agreement, the list of occupations and qualifications, areas and specialties, educational and professional programs, and diagnostics of quality of training. Ensuring employability of graduates: formalization of higher education documents, the quality of higher education and the competitiveness of graduates as the main guarantors of the employment.

**Methods and organization of research.** The theoretical basis of research. Science as a system of the world. Theoretical basis of research. Methodology and methods of research. Practical aspects of research. The logic of scientific research. Scientific papers and work on them.

---

2.2. *Disciplines chosen by students*  
2.2.1. *Cycle of professional training\**

*Production oriented disciplines*

**Master program “Economics and Economic Analysis in agricultural enterprises”**

**Economic analysis of agricultural enterprises.** Theoretical foundations of economic analysis. Subject and type of economic analysis of agricultural enterprises. Methods and techniques of economic analysis of agricultural enterprises. Economic analysis information base of agricultural enterprises. Methods and techniques of economic analysis of agricultural enterprises. Analysis of organizational and technological level of agricultural enterprises. Analysis of agricultural enterprises fixed assets. Analysis of agricultural enterprises profit and profitability. Analysis of agricultural enterprises financial situation.

**Business processes organization in agricultural enterprises.** Features of agricultural production. Market transformation and agribusiness in the regions of Ukraine. Calculation and analysis of production per capita ratio, inter marketability factor, self-financing ratio in the region. Evaluation of investment attractiveness of the property. Evaluation of share capital majority in market conditions of corporate ownership. Bankruptcy. The process of evaluating residual value. Evaluation of fixed assets. The amount of equity and working capital. Assessment and qualitative condition of machines and equipment. Business Analysis is the basic premise of planning in business. Factors for success in agribusiness. The essence, the task and the main purpose of a business plan. The concept, function and purpose of developing a business plan. The technology of the business plan.

**State economic policy in the field of agriculture.** Economic policy as a scientific and academic discipline. The objective necessity of economy state regulation. Functions of government that shape and implement economic policies in the field of agriculture. Structural policy in the field of agriculture. Policy renewal and support domestic producers and increase export potential. The state policy of resources rational use. Energy supply and energy efficiency. Politics of agriculture. Competition policy. Science, technology and innovation policy. Investment policy. Development of small and medium enterprises. Restore policy of handling public sector in agriculture.

**Master program “Economy and organization at enterprises of viticulture and wine-making sub-complex”**

**Economy and organization at enterprises of viticulture and wine-making sub-complex.** Features of viticulture. Production types of specialized production, viticulture and wineries. Inter-farm cooperatives, agro-industrial integration in viticulture and winemaking. Viticulture and state wine-making enterprises. Viticulture and wine-making sub-complex.

**Basics of business and agribusiness in viticulture.** Business planning. Characteristics of the enterprise. Analysis of production and economic activity of viticulture. The most important methods of planning and foundation funding. Theoretical and practical foundations of agribusiness in viticulture. Description and features of management in agribusiness growing.

**Economic policy in the field of agriculture** (see same discipline at student's choice in Master program “Economy and economic analysis of agricultural enterprises”).

**Master program “Economy of agricultural production and rural areas”**

**The economy of agriculture and rural areas.** Up-to-date status and trends of agricultural production. Agricultural policy as part of economic policy. The essence and

---

principles of agricultural policy. Arguments for and against state regulation of agriculture. A model of agricultural policy formation. Interest groups in agricultural policy. Objectives system of agricultural policy. Tools regulation of the agricultural sector. Pricing for agro-food market: challenges and basic tools. Main directions of agrarian policy in Ukraine. The goals and priorities of agrarian policy of Ukraine. The problems of food security in Ukraine. Formation of the domestic food market in Ukraine. Trends in food consumption in Ukraine, by the structure of rational nutrition standards. Public policy towards solving the food problem in the country.

**Markets and pricing in agriculture.** The economic essence of a market model of agriculture in Ukraine. The theoretical basis and practical aspects of agricultural marketing. Pricing in agricultural production. Market research and agricultural areas. Marketing of agricultural products. Pricing agricultural commodity markets. Channels of distribution management, trade and market policy agricultural enterprises and farms. Raw materials and food production marketing. Marketing material and technical resources in agricultural service. Marketing management model of agriculture.

**Economic policy in the field of agriculture** (see the same discipline at student's choice in Master's program "Economy and economic analysis at agricultural enterprises").

*Research oriented disciplines*

**Master program "Methods and organization of business at economic activities"**

**Innovative Economy.** The essential characteristics of innovation and innovation processes. Creating innovation features and shaping demand. Innovation policy of enterprise. Innovation management. Scientific and technological innovation process as an object of management. Management systems and innovation forms.

**Economic evaluation of the effectiveness at the organizational structure of agricultural enterprises.** The concept, the main types of business organizations, the types of organizational and management structures, types and characteristics of specialization and cooperation enterprise associations. Areas of impact on the enterprises associations. Organization of the activity features and funding of associations. Features of financial-industrial groups, multinational corporations, strategic alliances enterprises organization and functioning. Economic evaluation of the organizational structure effectiveness of enterprises.

**Economic policy in the field of agriculture** (see the same discipline at student's choice in Master's program "Economy and economic analysis of agricultural enterprises").

**Master Training  
in specialty “ACCOUNTING AND AUDITING”  
Branch of knowledge “Economics and business”**

<b>Form of training, licensed number of students:</b>	
– full-time	<b>10</b>
– correspondence	<b>10</b>
<b>Term of study</b>	<b>1 year</b>
<b>Credits</b>	<b>60 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian, Russian</b>
<b>Qualification of graduates</b>	<b>Master of Accounting and Audit</b>

**The concept of training**

According to the programme training of specialists in the field of economics and business aims meeting the needs of the agricultural sector of the country, including agricultural enterprises of all forms of ownership and legal form, in particular land relations, provision of highly qualified personnel at state organs, social organizations, enterprises and other organizations.

**Production oriented master program**

***Master program “Accounting in the foreign economic activity”***

The master's program aims to deepen the knowledge in account, analysis and audit during foreign activities. It allows students to be trained for the work at enterprises engaged in foreign activities. Also it allows gaining certain knowledge on the organization of international accounting standards.

**Sphere of graduates employment**

Certificated Masters receive Master's qualification in accounting and audit. According to received qualification graduates can take positions of economist in accounting and business analyst, economist of finance, chief accountant at the enterprises engaged in foreign activities. The program provides good training of future scientists, namely, postgraduate students, assistant at the chair, senior lecturer, researcher.

***Master program “Accounting in the system of firm running”***

The master's program allows deepening knowledge on the organization of management accounting. It is created to train managers in the field of accounting – accountants, analysts, expert consultants in the organization of management accounting. Special attention is paid to the study of management accounting tools, including - budgeting. It also allows gaining certain knowledge on the organization of information and consulting activities in Ukraine.

**Sphere of graduates employment**

Certificated Masters receive Master's qualification in accounting and audit. According to received qualification graduates can take positions of economist in accounting and business analysis, economist of finance, chief accountant of the enterprises. The level of training and qualifications of graduates gives them the opportunity to work on these positions at different economic agricultural enterprises, at state and local self-governed enterprises, relevant departments and offices. The program provides good training for future scientists, in particular, assistant at the chair, senior lecturer, researcher.

***Master program “The organization of accounting and audit of Land Relations”***

The master's program aims the formation of deep knowledge and skills for registration of land relations, environmental audit. Essentially a thorough study of the features of land assessment: mandatory, expert, regulations and documents on registration of land relations in agriculture.

**Sphere of graduates employment**

Certificated Masters receive Master's qualification in the order established by the legislation of Ukraine master's work, receive master's qualification in accounting and audit. According to received qualification graduates can take positions of economist in accounting and business analysis, economist of finance, chief accountant at the enterprises. The level of training and qualifications of graduates gives them the opportunity to work on these positions in the field of land relations. The program provides good training for future scientists, in particular, assistant at the department, senior lecturer, researcher.

**Research oriented master program**

***Master program “Methodology and organization of accounting of business entities”***

The master's program is created for those students who plan to continue to engage in research and teaching activities. It is recommended for students who have a tendency to scientific work and teaching. The program involves the study of research methods in accounting.

**Sphere of graduates employment**

Training and qualification of graduates on research specialization gives them access to employment at the Ministry of Agricultural Policy and Food of Ukraine and its territorial divisions, universities, academic and research institutions as academic staff.

**Practical training**

The period of the practical training of students in Master's programmes “Accounting and Auditing” is 6 weeks, 4 of which – practical training at the enterprise and 2 weeks – teaching practice. Industrial practice on the specialty provides practical skills for reporting and organization of account. Pedagogical practice involves learning skills of teaching in higher education.

The basis of practical training on the specialty includes State Enterprise “Training and research poultry breeding plant named after Frunze of the National University of Life and Environmental Sciences of Ukraine”, enterprise “Massandra”, Agricultural LLC Druzhba Narodiv, agrofirma Magarach of the National Institute Grapes and wine “Magarach”, LTD “Osaviahim” and other enterprises, as well as the structural units of the Ministry of Agricultural Policy and Food. The basis of teaching practice is a chair of accounting and audit at the university.

**Proposed Topics for Master Theses**

1. Formation of the accounting at the company by international standards.
  2. Audit at the company in accordance with the requirements of international standards.
  3. Analytical maintenance of accounting and reporting under international standards.
  4. The organization of management accounting at the enterprise.
  5. Organization of accounting of production (or other species) costs of the enterprise.
  6. Improvement of the budgeting process in the enterprises.
  7. Accounting and valuation of land in the agricultural enterprises.
  8. Audit of land relations.
-

**MASTER DEGREE PROGRAMS**

9. Accounting farmland.
10. Providing decision-making at the enterprise in the management accounts.

**Academic rights of applicants for a master program**

In addition to “Accounting and Auditing”, Bachelors in “Accounting and audit” can continue their education in specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master”  
in specialty “Accounting and Auditing”**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of professional training*</i>					
1	Strategic analysis	1	108	2,0	3,0
2	Financial management	1	108	2,0	3,0
3	Staff management	2	108	2,0	3,0
4	International Management	2	108	2,0	3,0
5	Reporting at enterprise	1	162	3,0	4,5
6	Organization of accounting	1	162	3,0	4,5
<i>Total according to regulatory part</i>			756	14,0	21,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<i>2.1. Disciplines chosen by University</i>					
<i>2.1.1. Cycle of professional training*</i>					
1	Strategy for the sustainable development of nature and society	1	36	0,7	1,0
2	Philosophy of science and innovation development	1	54	1,0	1,5
3	International standardization and certification of technology, raw materials and final products	1	54	1,0	1,5
4	Labor protection in industry	2	36	0,7	1,0
5	Civil protection	2	36	0,7	1,0
6	Methods of teaching at higher school	1	72	1,3	2,0
7	Models and methods of decision-making in analysis and audit	2	108	2,0	3,0
8	The methodology and the organization of scientific research	2	72	1,3	2,0
<i>Total chosen by university</i>			468	8,7	13,0
<i>2.2. Disciplines chosen by students</i>					
<i>2.2.1. Cycle of professional training*</i>					
Production oriented disciplines					
Master program "Accounting in the foreign economic activity"					
1	Financial accounting and reporting under the international standards	2	108	2,0	3,0
2	Accounting forensic examination	2	72	1,3	2,0
3	Financial analysis	2	108	2,0	3,0
<i>Total selected by the students</i>			288	5,3	8,0
Master program "Accounting and audit of land relations"					
1	Accounting and tax account of land relations	2	108	2,0	3,0
2	Audit and evaluation of land	2	72	1,3	2,0
3	Financial analysis	2	108	2,0	3,0
<i>Total selected by the students</i>			288	5,3	8,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	credits	
				national	ECTS
<b>Master program "Accounting in the enterprise management system"</b>					
1	Cost accounting and budgeting at the enterprises of the agroindustrial complex	2	108	2,0	3,0
2	Controlling	2	72	1,3	2,0
3	Financial analysis	2	108	2,0	3,0
<i>Total selected by the students</i>			288	5,3	8,0
<b>Research oriented disciplines</b>					
<b>Master program "The methodology and accounting organization of business entities"</b>					
1	Accounting in the enterprise management	2	108	2,0	3,0
2	Accounting forensic examination	2	72	1,3	2,0
3	Financial analysis	2	108	2,0	3,0
<i>Total selected by the students</i>			288	5,3	8,0
Total number of elected part			756	14,0	21,0
Practical training			324	6,0	9,0
Writing and defense of master's thesis			324	6,0	9,0
Total for specialty			2160	40,0	60,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

## Annotations of disciplines in the curriculum

### 1. REGULATORY ACADEMIC DISCIPLINES

#### 1.1. Cycle of professional training\*

**Strategic analysis.** Strategic analysis and its place in economic management of the enterprise. Analysis of the results of the company. Standards for strategic analysis. Classification and economic evaluation of production units. Analysis of the distribution of industrial resources to the production. Development and economic feasibility of the production program strategy. Strategic analysis of the company's capital structure. Strategic analysis of the financial performance of the company. Strategic analysis of the investment.

**Financial management.** Theory and organizational foundations of financial management. Supplying system of financial management. Cash flow management in the enterprise. Determining the value of money and its use in financial calculations. Profit management. Asset management. The cost and capital structure optimization. Investment management. Financial risk management. Analysis of the financial statements. Firm internal financial forecasting at the enterprise. Anti-crisis financial management at the enterprise.

**Staff management.** The staff of the organization as an object of management. Management methodology. Resource maintenance of personnel management. Social and psychological aspects of personnel management. Personnel department and staff record keeping. Planning and formation of staff. Staff development. The movement of personnel. Adjustment of employment of staff. Creating favorable conditions. Evaluation of staff. Motivation and encouragement of staff. Social partnership in the organization. The effectiveness of management.

**International management.** The essence and characteristics of international management. Environment of international management. Strategic planning for international corporations. Decision-making in international corporations. Organizational development of international corporations. Human resource management in international corporations. Supervision and communication in international corporations. Control and reporting of international corporations. Technology policies for multinational corporations. Financial management of multinational corporations. Trading operations of international corporations. Investment operations of international corporations. Ethics and social responsibility of multinational corporations. Formation of global management.



**Statements of entity.** General reporting requirements. The balance of the company. Report on financial results. Statement of Cash Flows. Equity report. Correction of errors and changes in the financial statements. Consolidated financial statements. The financial report of a small business. Tax reporting. Statistical and special reports.

**The organization of accounting.** Basics of accounting organization. The organization of the regulatory accounting supplying. The organization of accounting process. Organization of the account equity. Accounting of obligations. Organization of accounting and analysis of long-term assets. Organization of accounting and analysis of current assets. Organization of accounting and analysis of costs, revenues and results of operations of the enterprise. The organization of the personnel engaged in accounting, control and analysis. The organization of information, and provide technical accounting, control and analysis. Planning for future development of accounting.

## **2. ELECTIVE ACADEMIC DISCIPLINES**

### *2.1. Disciplines chosen by University*

#### *2.1.1. Cycle of professional training\**

**The strategy of sustainable development of nature and society.** Problems of interaction between people and the environment, the basic concepts of the principles of the strategy of sustainable development of society, the concept of the biosphere as a dynamic system, the basic data on global environmental issues of humanity – and the development of resources, human impact on the biosphere. Criteria for the stability of social-ecological systems, the system of balanced development of natural and man-made systems and situational modeling of social development, economic, social, political, environmental and ethical problems of development, problems of decision-making.

**Philosophy of science and innovation.** The concept of science. Cognition, types of knowledge. The specificity of scientific knowledge. The structure and dynamics of science. Science and philosophy in the history of their relationship. The problem of coordination of scientific research. Classification of Aristotle science. Universities as centers of scientific knowledge. The formation of experimental science in the Renaissance. The main methods in the development of science: scientific hypothesis, experiment, observation. The ratio of the deductive, hypothetical-reductive and experimental methods in the science of modern times. The ratio of the empirical and theoretical level of knowledge. Place of Marxist dialectics in science XIX century. Major trends and schools of philosophy of science: the second wave of positivism, idealism, neo-dialectical materialism. The problem of justification of knowledge and criterion validity of knowledge. Popper's critical rationalism. The principle of falsification. Kinds of methods and their characteristics: induction, deduction, analysis, synthesis, analogy, modeling, abstraction, idealization, axiological and hypothetical, deductive method. Empirical and theoretical methods, their relationship.

**International standardization and certification of technology, raw materials and final products.** The International Organization for Standardization. The International Electrotechnical Commission. Economic Commission for Europe. The Food and Agriculture Organization of the United Nations. The Commission "Code Alimentarius" to develop standards for food products. Harmonization of standards. The U. S. National Institute of Standards and Technology. The British Standards Institute. German Standards Institute. The French Association for Standardization. Japanese Industrial Standards Committee. The organization works on standardization in the Russian Federation. Regional Organization for Standardization. European Committee for Standardization. The activities of the EU standards. Inter-Scandinavian Organization for Standardization. The International Association of South-East Asia. Standardization in the Commonwealth of Independent States. International certification and product quality control at the international and regional levels. Certification in Russia. Certification in USA. Certification in Germany. Certification in France. Certification in Japan.

---

**Labor protection in the industry.** Traumatism and illness among workers. The traumatic factors. Dynamics of the traumatism and the analysis of its performance. The Labor Code. The control and management responsibility for ensuring of labor protection at the plants and objects. The structure of labor protection in industry and actions of government safety inspections. Labor protection service in the enterprise. Safety standards system (SSS). Concept and definitions of industrial hygiene. Industrial hygiene. Industrial sanitation and traumatism, and occupational diseases. Harmful and safety hazards factors in the workplace and work areas. Working conditions of employees. The concept and definition of noise. The vibrations and their harmful effects on humans. Factors and causes of traumatizing of the workers in the work processes and use of technology. Safety in the cultivation of crops. Safety at work on farm machinery, plant, combine harvesters, etc. Electric current and its effects on humans and animals. Procedures for investigating accidents and occupational diseases. Providing assistance to the victim. Structure of the commission and its formation. The order of investigation. Forms of acts "H-1". Documentation on the accident investigation. Education of workers for the protection of labor. Types of safety briefings: introductory, primary, at the workplace, repeated, unplanned and targeted.

**Civil protection.** Civil defense in modern conditions. Emergencies – a real threat to people and the environment. The law and the provisions of civil protection in Ukraine. The role, place and tasks of civil defense. Activities of the Government on fastening of civil defense. Permanent Emergency Commission, its goals, objectives and operating procedure in extreme conditions. General principles of organization of civil defense of Ukraine and the structure of the office of civil defense in agricultural area. Extreme conditions of peace and war time, their influence on the livelihoods of the population. The reasons of occurrence and classification of emergencies. Characteristic of possible emergencies in Ukraine. Brief characteristics of natural disasters, accidents and catastrophes. Characteristic of activity during disasters: earthquakes, floods, hurricanes, tornadoes, fires, landslides, snow drifts. Characteristic of areas of contamination in the industrial accidents and catastrophes in explosion hazardous chemical production plants and nuclear power. People's actions in emergency situations. Influence of highly toxic substances and biological agents on agricultural production. Chemical contamination of the area and center of chemical destruction. Biological weapon of destruction, its features and the propagation path. The center of bacteriological contamination. The impact of the damaging factors of nuclear explosions and accidents at nuclear power plants. Damaging factors of a nuclear explosion, their brief description. Characterization zones of radioactive contamination. Assessment of radiological engineering and fire situation. Evaluation of chemical and bacteriological conditions. Civil defense structures and their requirements. Individual and medical protective equipment of humans and animals. Planning of civil defense measures in the agricultural enterprise. Basis of sustainability of agriculture enterprise in emergencies. Methods of assessing the sustainability of the agricultural objects and sectors of agricultural production in emergency situations. Bases of protection of crops and livestock industries, machines and tractors, fuel and energy complex, hydraulic works and the threat of an emergency.

**Methods of teaching in high school.** Two-cyclic training at high school; levels of graduates, professions, qualifications, specialties and directions; regulatory materials and legal framework of the Bologna system. Credit-module system with a point-rating estimation of results. Scale of assessment of knowledge and stimulating of learning elements. Key problems and concepts: ECTS credits, their value; module, meaningful module, block of modules, educational discipline, modular technology education, credit-modular system of educational process, training objects and training elements, independent work of the student and its methodological support, information package, learning contract, coordinators of ECTS; assessment of results a scale of ECTS; the learning complexity. Ensuring the quality of higher

---

education: the criteria of the control within the university, national (state) and the European control of knowledge, criteria of competitiveness of the graduate. Assuring mobility of students, graduates, teachers, scientists and administrators. The criteria which guarantee mobility (the quality of higher education, the participants of the educational process, regulatory and legal framework). The agreement, the list of occupations and qualifications, areas and specialties, educational and professional programs, and diagnostics of quality of training. Ensuring employability of graduates: formalization of higher education documents, the quality of higher education and the competitiveness of graduates as the main guarantors of the employment.

**Models and methods of decision-making in the analysis and audit.**

Management decisions: classification, comparability and risk factor. Methodology of maintenance the competitiveness of administrative decisions. Technology of development and implementation of management decisions. Methods of analysis of management decisions. Bases of application activity-based costing. Analysis of the effectiveness of resource use. Forecasting of management decisions.

**The methodology and the organization of scientific research.** Theoretical bases of scientific research. Science as a system of ideas about the world. Theoretical bases of scientific research. The methodology and methods of scientific research. Practical aspects of scientific research. The logic of scientific research. Scientific papers and work on them. Student's independent work on a master's work.

*2.2. Disciplines chosen by students*

*2.2.1. Cycle of professional training\**

*Production oriented disciplines*

**Master program "Accounting in the foreign economic activity"**

**Financial accounting and reporting under international standards.** Definition and classification of accounting systems. Accounting model, the nature and its characteristic features. Harmonization and standardization of accounting systems. Activities of international accounting organizations for establishing an international system of accounting and reporting. The history of creation and organization of activities of the Committee on International Accounting Standards Board (IASB). The procedure of creating IAS. The scope of IAS. The purpose, structure, and users of financial statements. General requirements for the provision of information in the financial statements. Elements of financial statements. Accounting of fixed assets: concept, features of evaluation and accounting reflection. Borrowing costs: concept and evaluation. Impairment of assets. Identification and assessment of impairment of assets. Investment property: the recognition, evaluation and accounting. Rent: concept, types and features of the account. Operating leases and leasing. Financial instruments: recognition and measurement. Classification of financial instruments and their accounting. Inventories: assessment, accounting, reflected in the financial statements. The concept, recognition and measurement of revenue. Identification of the operations associated with obtaining revenue. Receivables. Contract agreements. Features of the recognition of revenue and expenses on construction contracts. Accounting of short-term and long-term employee benefits. Income tax: recognition and method of calculation. Disclosure of information about income taxes in the financial statements. The content of the balance, structure and formats. Events after the balance sheet date and methods of their correction. Purpose, structure and content of statement of the profit and loss. The procedure of calculation earnings per share. The structure and content of the statement of changes in equity. Methodology of the statement of cash flows. Purpose, scope and presentation of the consolidated financial statements. Consolidation procedures of the financial statements. Disclosure of information on consolidation of the financial statements. A retrospective and prospective application of changes in accounting policies. Changes in accounting estimates. Conversion of financial statements. Methods of formation of the financial statements according to international standards. Stages of transformation. Reclassification of

---

income, expenses, assets and liabilities in the transformation of the IAS. Advantages and disadvantages of transformation according to IAS.

**The forensic accounting.** The main provisions of forensic accounting; forensic accounting, conduct; methodological aspects of the use of accounting records in the identification and investigating of offenses in the national economy; the use of accounting registers and primary documents in the identification and investigating abuse of the banking system and in the enterprises of small businesses, especially revision, which are held on the initiative of bodies of inquiry and investigation.

**The financial analysis.** Theoretical basis of financial analysis; the overall assessment of the financial condition of the company; the analysis of financial stability; solvency and liquidity analysis; cash flow analysis; analysis of creditworthiness of the company; analysis of the efficiency of capital use; assessment of production and financial leverage; the analysis of business activity and investment attractiveness of enterprises; short-term forecast of the financial condition of the company; the analysis of the financial condition of insolvent enterprises, strategic analysis of financial risks.

### **Master program “Accounting and audit of land relations”**

**Accounting and tax accounting of land relations.** The legal basis of land relations in Ukraine. The legal framework of regulating land relations. The subjects of land relations. Types of ownership of the land. Material rights of the land. Legal basis for the land lease. Land transactions and its documentary registration. Purchase and sale, donation, exchange of land, transfer of land by inheritance, the privatization of land by citizens, the removal of land from private property. The right of permanent use of land. Contracts which package various types of land transactions and its notarial certification. Accounting of land on the property rights. The order of registration of ownership to land. Land privatization in the presence of buildings and without them. State registration of any documents titled to the land. The reflection in analytical and synthetic accounting sections owned and costs associated with their acquisition and exploitation. Accounting of leases of land. The order of concluding the lease contract, its essential terms. Rights and duties of land users in the lease agreement. Rents. The termination of the lease of land. Reflection in the accounting leased land and rents on them. Accounting of land rights. Types of land rights and the procedure of its documenting. Procedure for the conclusion of agreements on the use of rights. Distinctive features and cases of using certain types of rights. Analytical and synthetic accounting of land rights. Accounting for capital expenditures on land improvements. Types of capital expenditure on land improvements. The costs associated with the construction of structures on land improvements. Accounting for costs associated with the improvement of land in the process of their implementation and their capitalization in accounting. The organization of analytical accounting costs associated with the improvement of land. Amortization of expenses related to the improvement of land. Responsibility for disturbance of land legislation. Responsibility for disturbances related to the procedure for the use and protection of land: civil, administrative and criminal. Responsibility for disturbances related to the payment of land tax. The payers of land tax. Subjects and objects of payment for the land. Tax rate. Exemptions from payment of land tax. Indexation of monetary valuation of the land and the land tax rates. Reporting on the payment for the land. Features taxation operation of concessions: features calculation and payment of VAT, income tax, personal income tax. Reflected in the tax accounting of ownership, rights to land and the cost of its improvement. Taxation of income tax and VAT lands owned and constant used. Taxation of land rights: VAT, income tax, personal income tax. Reflection in the tax accounting costs associated with the improvement of land. The order of amortization of these costs.

**Audit and assessment of land.** Organs of the constituent and executive authorities, relating to the regulation of land relations. Ownership of the land: the concept, the forms, the rights and responsibilities of land owners. Land use rights. Categories of

---

land for the intended purpose. International practice of environmental audit. The history of an environmental audit. The program of environmental management and audit. Evaluative standards in the field of environmental impact. Features of environmental audit in different countries of the world. Environmental audit of agricultural enterprises. The essence of environmental audits. The main objectives and tasks of environmental audit. The direction of the environmental audit and its types. Composition of services provided by the auditors. Auditor's documents. Land audit as a part of an environmental audit. The main objective of the land audit. The documents which must to be examined during the audit of the earth. The main types of work including in the land audit. Audit of mandatory payments related to land holdings. Types of payments, the amounts of which are calculated in relation to the size and quality of land resources of the enterprise. The order of its payment. Documentation, which are made obligatory payments related to land resources. Basic principles and procedures for auditing obligatory payments related to land resources company. Features of land as a commodity. Regulatory documents governing the use of the results of monetary value in the implementation of market-based land transactions. The concept of the state land cadastre, as the national system of accounting and valuation of land. Conduct of business and the use of the State Land Cadastre. Regulatory and monetary value of land. The order of the normative monetary value of agricultural lands and settlements and particularly its application. The order of the normative monetary evaluation of non-agricultural land. Features of the normative monetary evaluation of land of natural reserve, environmental, recreational, historical and cultural and also forest land. Expert assessment of land. Cases of application and the stages of expert monetary valuation of land. Methodology of expert monetary valuation of land. Approaches to assessment (income, cost, comparative) and evaluation methods used in these approaches. Additional methods of valuation of land. Factors affecting to the cost the land. Evaluation of partial property rights to land.

**The financial analysis.** Theoretical basis of financial analysis; the overall assessment of the financial condition of the company; the analysis of financial stability; solvency and liquidity analysis; cash flow analysis; analysis of creditworthiness of the company; analysis of the efficiency of capital use; assessment of production and financial leverage; the analysis of business activity and investment attractiveness of enterprises; short-term forecast of the financial condition of the company; the analysis of the financial condition of insolvent enterprises, strategic analysis of financial risks.

### **Master program “Accounting in the enterprise management system”**

**Accounting of cost and budgeting at the enterprises of agroindustrial complex.** The essence of the costs and the need for their classification: fixed and variable costs. The behavior of the fixed and variable costs, the zone of relevance. Methods for determination of cost functions. The cost functions in making management decisions. Regulatory support of cost accounting and calculation of the cost of agricultural products. Objects of cost accounting and calculation items. Accounting and assessment of the costs by the economic elements. Cost accounting by calculation items. Features of accounting and distribution overheads. Methods of costcalculation and types of calculation. Characteristics of accounting system and calculation of complete and incomplete (variable) costs. The essence and the basic objectives of the accounting organization of regulatory costs. Formation of regulatory costs on farms. Deviations analysis of actual costs from standard. The purpose and methods of analysis of the relationship between costs, outputs and profits, margin of safety. Analysis of the influence of change in costs, outputs and sales on the profitability of the enterprise and its margin of safety. The essence of the effect of operating leverage and the method of calculation. The essence of budgeting and types of budgets. Making up and approval of budgets. Control budget execution and analysis of deviations. The concept of centers and accounting

---

responsibilities. Composition and evaluation cost of responsibility centers. Budget planning of responsibility center. Assessment of the implementation of the budget of responsibility center and indicators of its efficiency. The essence and purpose of budgeting. The direction of budgeting. The Budget Committee and its tasks. Functions of accounting analyst in the process of budgeting. Sales forecast and sales budget – the purpose and procedure of making up. The composition of the budgets and the order of their drawing up in the manufacturing enterprise. Budgetary control. Management in the deviations. Flexible budget – the order and the purpose of the procedure. The notion of responsibility center and the order of its separation. Performance of measures of responsibility centers. Standard costs – essence and accounting. Relationship standard cost accounting and cost accounting by responsibility centers. The criteria and methods for determining the deviation. The order of evaluation of the profit center.

**Controlling.** Theoretical concepts of controlling, subject and methods of controlling, controlling system and modern business, management accounting as a source element of controlling system, the system “standard-cost” its characteristic; the accounting organization of cost and results in the “direct cost”; budgeting as a tool for operative controlling; budgeting methods; methods of differentiation of costs; the concept and methodology of conducting “ABC-analysis”, volume analysis and the analysis of “bottlenecks” in the enterprise, criteria of investment projects in controlling.

**Financial analysis.** Theoretical basis of financial analysis; the overall assessment of the financial condition of the company; the analysis of financial stability; solvency and liquidity analysis; cash flow analysis; analysis of creditworthiness of the company; analysis of the efficiency of capital use; assessment of production and financial leverage; the analysis of business activity and investment attractiveness of enterprises; short-term forecast of the financial condition of the company; the analysis of the financial condition of insolvent enterprises, strategic analysis of financial risks.

*Research specialization*

**Master program “The methodology and accounting organization of activity of business entities”**

**Accounting in the management of the company.** The purpose, the content and organization of management accounting. The composition, classification and behavior of the production costs. The system and methods of calculation of costs. Analysis of the relationship of costs, outputs and profits. Analysis of the relevant information for making management decisions. Budgeting and control. Responsibility accounting.

**The forensic accounting.** The main provisions of forensic accounting; forensic accounting, conduct; methodological aspects of the use of accounting records in the identification and investigating of offenses in the national economy; the use of accounting registers and primary documents in the identification and investigating abuse of the banking system and in the enterprises of small businesses, especially revision, which are held on the initiative of bodies of inquiry and investigation.

**The financial analysis.** Theoretical basis of financial analysis; the overall assessment of the financial condition of the company; the analysis of financial stability; solvency and liquidity analysis; cash flow analysis; analysis of creditworthiness of the company; analysis of the efficiency of capital use; assessment of production and financial leverage; the analysis of business activity and investment attractiveness of enterprises; short-term forecast of the financial condition of the company; the analysis of the financial condition of insolvent enterprises, strategic analysis of financial risks.

**Master Training**  
**in specialty “MANAGEMENT OF ORGANIZATION AND ADMINISTRATION”**  
**Branch of knowledge “Management and Administration”**

Form of training, licensed number of students:

– full-time	15
– correspondence	10
Term of study	1,5 years
Credits	90 ECTS
Language of teaching	Ukrainian, Russian
Qualification of graduates	master's degree in management of organizations and administration

**The concept of training**

The master's program aims to train specialists in the area of management and administration to meet needs of the agroindustrial sector in the state, including agricultural enterprises of all forms of ownership and organizational forms, the field of land relations, providing highly qualified government, public organizations, other enterprises and organizations.

**Production oriented master program**

***Master program “Management in Agribusiness”***

It allows studying in details the components of management at agricultural enterprises. The program forms knowledge and skills of the strategy management and evaluation in management.

**Sphere of graduates employment**

Certificated Masters receive Master's qualification in middle and senior level of management at enterprises. The level of graduates gives them the opportunity to work in different entities of AR of Crimea, the state executive authorities, local governments, relevant departments and offices. The program provides both adequate training of future researchers, in particular, graduate, assistant professor, senior lecturer, researcher.

***Master program “Management of logistics systems”***

Master's program aims at gaining deep knowledge and skills in market research and solving logistical problems. Essential matter is perfect learning optimization ways of charges and rationalization process of production, distribution and related services, both within a single agricultural enterprise and a group of companies.

**Research oriented master program**

***Master program “Theory and practice of management at agricultural enterprises”***

The master's program is created for those students who plan to continue to carry out research and teaching. The program includes the study of methods of decision-making and management components of a successful career.

**Sphere of graduates employment**

---

## MASTER DEGREE PROGRAMS

Training and qualification of graduates on research specialization gives them access to employment at the Ministry of Agricultural Policy and Food of Ukraine and its territorial divisions, universities, academic and research institutions as academic staff.

### Practical training

The period of the practical training of students in Master programs “Management of Organization and Administration” is 8 weeks, 6 of which – practical training at the enterprise and 2 weeks – pre-diploma practice. Industrial practice on the specialty provides practical skills for reporting and organization of account. Pedagogical practice involves learning skills of teaching in higher education.

The basis of practical training on the specialty includes State Enterprise “Training and research poultry breeding plant named after Frunze of the National University of Life and Environmental Sciences of Ukraine”, enterprise “Massandra”, Agricultural LLC Druzhba Narodiv, agrofirma Magarach of the National Institute Grapes and wine “Magarach”, LTD “Osaviahim” and other enterprises, as well as the structural units of the Ministry of Agricultural Policy and Food. The basis of teaching practice is a chair of accounting and audit at the university.

### Proposed Topics for Master Theses

1. Resources to improve the management of the enterprise.
2. Rationalization management of employees.
3. Innovative organization forms of the head of the enterprise.
4. Innovative Labor Organization Manager.
5. Rationalization of the functional organization of human resource management.
6. Organization strategic management.
7. Organization strategic planning.
8. Improvement of the competitiveness of products.
9. The organization and improvement of resource management system.
10. Organization of management development at the company.

### Academic rights of applicants for a master program

In addition to “Management of Organization and Administration” Bachelors can continue their education on the specialty in the field of knowledge **“Management and administration”**:

- 8.03060104 – Management of Foreign Economic Activities (see p. 389 )

specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

### Curriculum for specialist training of the educational and qualification level “Master” in specialty “Management of Organization and Administration”

№	Discipline, practice	Semester	Volume		
			hours	credit	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of professionally-oriented, humanitarian and socio-economic training*</i>					
1	Intellectual property	2	54	1,0	1,5
2	A labour protection in industry	2	54	1,0	1,5



**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	credit	
				national	ECTS
3	Civil defense	2	54	1,0	1,5
4	Contractual law	1	54	1,0	1,5
5	Methodology and organization of scientific researches	2	72	1,3	2,0
<i>Total number</i>			288	5,3	8,0
<i>1.2. Cycle of professional and practical training*</i>					
1	Public administration	2	108	2,0	3,0
2	Business administration				
2.1	Management of organizations	1	108	2,0	3,0
2.2	Corporate management	2	108	2,0	3,0
2.3	Management of changes	2	108	2,0	3,0
2.4	Management of projects	1	108	2,0	3,0
2.5	Management of quality	2	108	2,0	3,0
3	Financial management	1	108	2,0	3,0
4	The informative systems and technologies in the management of organization	1	108	2,0	3,0
<i>Total number</i>			864,0	16,0	24,0
Total according to regulatory part			1152,0	21,3	32,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
2.1. Disciplines chosen by University					
2.1.1. Cycle of professionally-oriented, humanitarian and socio-economic training*					
1	Strategy of constant development of nature and society	3	36	0,7	1,0
2	Philosophy of science and innovative development	3	54	1,0	1,5
3	International standardization and certification of technologies, raw material and obtained products	3	54	1,0	1,5
<i>Total number</i>			144	2,7	4,0
2.1.2. Cycle of professional and practical training*					
1	Teaching methodology at higher school	1	72	1,3	2,0
2	Investment management	3	72	1,3	2,0
3	Management of personnel	2	108	2,0	3,0
<i>Total number</i>			252	4,6	7,0
<i>Total chosen by university</i>			396	7,3	11,0
2.2. Disciplines chosen by students					
2.2.1. Cycle of professional training*					
Production oriented disciplines					
Master program "Management in agribusiness"					
1	Psychology of management	1	72	1,3	2,0
2	Management in development of rural territories	3	108	2,0	3,0
3	Management of agricultural product competitiveness	3	144	2,7	4,0
4	Administrative economy	3	144	2,7	4,0
5	Advertisement activity of agricultural enterprises	3	144	2,7	4,0
<i>Total selected by the students</i>			612	11,4	17,0
Master program "Management of logistic systems"					
1	Management of logistic systems	1	72	1,3	2,0
2	Management of sale and supply	3	108	2,0	3,0
3	Management of agricultural product competitiveness	3	144	2,7	4,0
4	Methods and systems of management of quality	3	144	2,7	4,0
5	Management of agricultural infrastructure	3	144	2,7	4,0
<i>Total selected by the students</i>			612	11,4	17,0
Research oriented disciplines					

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	credit	
				national	ECTS
Master degree program "Theory and practice of management of agrarian enterprises"					
1	Psychology of management	1	72	1,3	2,0
2	Axiology and career of manager	3	108	2,0	3,0
3	Theory and practice of acceptance of administrative decisions	3	144	2,7	4,0
4	Management of agricultural infrastructure	3	144	2,7	4,0
5	Management of logistic systems	3	144	2,7	4,0
<i>Total selected by the students</i>			612	11,4	17,0
Total number of elected part			1008	18,7	28,0
Practical training			432	8,0	12,0
Writing and defense of master's thesis			648	12,0	18,0
Total for specialty			3240	60,0	90,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of professionally-oriented, humanitarian and socio-economic training\**

**Intellectual property.** Concept of intellectual property. Objects and subjects of intellectual property. The system of guard of intellectual property in Ukraine. Legal safeguard of objects. International legal safeguard of intellectual property. Protection of intellectual ownership rights.

**Labour protection in industry.** International norms in industry of labour protection. Basic legislative and normatively-legal acts about labour protection in industry. Traumatism and professional diseases in industry. Investigation of accidents. The special divisions of labour protection in industry. Social security at work, industrial accidents and professional diseases.

**Civil defense.** Planning the measures of civil defense. Methods of calculation of zones damaged from technogenic explosions and fires and antiexplosive and fire-prevention defense. Predicting the situations and planning measures on nuclearzones, chemical and biological contamination, evaluation of engineering situation and socio-economic consequences.

**Contractual law.** A concept and general description of contractual right in Ukraine. Agreements in economic activity. Implementation of contractual obligations. Agreements on the transfer of property. Agreements on implementation of work, agreements.

**Methodology and organization of scientific researches.** Methodology: essence, maintenance, concept, problems of scientific cognition in the history of philosophy. Dialectical and logical bases in scientific cognition. Specific scientific cognition. Conceptual bases of scientific knowledge. Table of contents and structure in the process of scientific research. Levels and methods in scientific research. Organization of research work at Master's project. Result registration at scientific researches and their introduction in practice.

##### *1.2. Cycle of professional and practical training\**

**Public administration.** Object and methodological basis in public administration. Basic theories in management society. Social and political fields. Public administration and power. Laws and principles in public administration. Public administration as a process. Acceptance and implementation of administrative decisions. Values and "tree of aims" of public administration. Mechanisms, organs, methods and styles of public administration. Bureaucracy in the system of public administration. Anticorruption activity in the field of

public administration. Effectiveness and efficiency in public administration. Basic principles of public administration in a social field.

**Business administration:**

**Management of organizations.** System model in the management of organizations. Evaluation of an organization. Organizational mechanism in management of organizations. Organizational engineering. Administrative models. Guidance in organization. Protections of organization from risks. Management effectiveness in management of organization.

**Corporate management.** Theoretical corporate basis. External field of corporate management. Participants of corporate relations and organs of corporate management. Tactical and strategic management of corporations. Efficiency valuation in corporate management.

**Management of the projects.** Management of the projects in the system of management of organizations. The project justification. The project planning. Control of implementation at projects. Management of project risks. Management of the project quality. Management of the human resource in the projects.

**Management of quality.** Technology standardization in quality management. Main problems of quality management. International experience of quality management. Domestic experience of quality management. The base conception of the general quality management. The control system of quality.

**Financial management.** The essence, purpose and functions of financial management at the enterprises. The methodological bases of ensuring financial management at the enterprise. Financial strategy at the enterprise. Management at the enterprise assets. Bases of investments management at the enterprise. Management of cash flows at the enterprise. Management of financial risks at the enterprise. The bases of crisis financial management.

**The information systems and technologies in organization management.** Introduction in information systems of management at the enterprise. The stages of development and essence of information systems in management at the organization. Typology of information systems in management at the organization. The development planning of administrative information systems. Management of information systems at the organization. The corporate information systems. Information resources of the global Internet. Local and regional informative networks in modern organizations. Safety of the information systems. Processing and information analysis. Technologies of information processing. The automated systems of planning and the analysis of information systems.

## 2. ELECTIVE ACADEMIC DISCIPLINES

### 2.1. Disciplines chosen by University

#### 2.1.1. Cycle of professionally-oriented, humanitarian and socio-economic training\*

**Strategy of constant development of nature and society.** Problems of interaction of people and environment, main concepts of the principles of strategy of development of society. Concepts of the biosphere as dynamic system. The main data on global environmental problems of mankind – resources and development. Anthropogenous influence on the biosphere. The criteria of firmness of social-and-ecological systems, economic, socio-political, environmental and ethic problems of development. Problems of adoption at administrative decisions.

**Philosophy of science and innovative development.** Concept of science. Knowledge, types of knowledge. Specifics of scientific knowledge. Structure and dynamics of science. Science and philosophy. Their relationship in the history. Science within philosophy, the Problem of coordination of scientific researches. Classification of Aristotles science. Universities as the centers of scientific knowledge, formation of experimental natural study in Renaissance. The main methods in science development: scientific

hypothesis, experiment, supervision. Ratios empirical and theoretical equal knowledge. Place of Marxist dialectics in science of the XIX century. Main directions and schools of philosophy of science. Types of methods and their characteristic: induction, deduction, analysis, synthesis, analogy, modeling, abstraction, idealization, method, empirical and theoretical methods, their ratio.

**International standardization and certification of technologies, raw materials and obtained products.** The international organization of standardization. International electrotechnical commission. The European economic commission of the UN. Food and agricultural UN organizations. The commission “the Code Alimentarius” on development of standards on foodstuff, harmonization of standards. American national institute of standards and technologies. British institute of standards. German institute of standards. The French association on standardization. Japanese committee of industrial standards. The organization of works on standardization in the Russian Federation. The regional organizations on standardization. The European committee on standardization. Activities of EU for standardization. The Inter-Scandinavian organization on standardization. International association of the countries of South East Asia. Standardization in the Commonwealth of Independent States. The international certification and product quality control at the international and regional levels. Certification in Russia. A certification in the USA. A certification in Germany. A certification in France. A certification in Japan.

#### *2.1.2. Cycle of professional and practical training\**

**Teaching technique at the higher school.** Two-cyclic training at high school; levels of graduates, professions, qualifications, specialties and directions; regulatory materials and legal framework of the Bologna system. Credit-module system with a point-rating estimation of results. Scale of assessment of knowledge and stimulating of learning elements. Key problems and concepts: ECTS credits, their value; module, meaningful module, block of modules, educational discipline, modular technology education, credit-modular system of educational process, training objects and training elements, independent work of the student and its methodological support, information package, learning contract, coordinators of ECTS; assessment of results a scale of ECTS; the learning complexity. Ensuring the quality of higher education: the criteria of the control within the university, national (state) and the European control of knowledge, criteria of competitiveness of the graduate. Assuring mobility of students, graduates, teachers, scientists and administrators. The criteria which guarantee mobility (the quality of higher education, the participants of the educational process, regulatory and legal framework). The agreement, the list of occupations and qualifications, areas and specialties.

**Investment management.** Concept, essence of investment management. Investments and investment activity of the enterprises in market conditions. Investment climate, its components and approaches to the assessment. Concept and essence of the investment project. Bases of formation in the business plan of innovative and investment projects. Methods of an assessment to investment projects. Investment monitoring.

**Staff management.** The staff of the organization as an object of management. Management methodology. Resource maintenance of personnel management. Social and psychological aspects of personnel management. Personnel department and staff record keeping. Planning and formation of staff. Staff development. The movement of personnel. Adjustment of employment of staff. Creating favorable conditions. Evaluation of staff. Motivation and encouragement of staff. Social partnership in the organization. The effectiveness of management.

### *2.2. Disciplines chosen by students*

#### *2.2.1. Cycle of professional training\**

*Production oriented disciplines*

**Master program “Agribusiness Management”**

**Psychology of management.** Management psychology as science, object, subject and methods of psychology of management. Concept “system” and “structure” as organization models in object field of psychology of management. General psychological characteristic of activity. Psychological laws of administrative activity. Leadership psychology. Dynamics of the conflict. Social influence and its tools.

**Management of development at rural territories.** Management of development of rural territories: essence and basic concepts. Organizational structure of local administration. Technologies of municipal management in development of rural territories. Technologies of adoption of municipal administrative decisions. Responsibility of local governments.

**Management of competitiveness of agricultural products.** External and internal factors affecting the competitiveness of products and businesses. Terms of competitiveness. Organizational measures improving the competitiveness of the enterprise. Technology as a factor of creating competitive advantage. Classification and nature of basic management of competitive advantage. Criteria for ranking competitors. Determination of market size. Comparative analysis of product range. Structure of competitiveness. Competitiveness of goods at the market economy. Relationship of use-values. Prices and product competitiveness. Image and informative product. Quality Management Strategy. Ways to improve the competitiveness of goods. Milestones of competitiveness evaluation. The importance of indicators in integrated assessment system. Integral indicators of competitiveness.

**Managerial Economics.** The economic definition of firm and making optimal decision. Alternative models of firm behavior. Supply and demand. The elasticity of demand. Theory and assessment of production. Value of expenses in management decisions. Decisions on pricing and output: perfect competition and monopoly. Deciding on prices and output: monopolistic competition and oligopoly. Features pricing. Economic efficiency analysis of the planned investment and risk. Globalization and management of multinational corporation. The problems of government intervention in the market economy.

**Promotional activities at agricultural enterprises.** Fundamentals of advertising. The legal aspects of advertising. The main aspects in the field of advertising. The legal aspects of advertising. Concept, types of improper advertising. Activities of public oversight bodies in advertising. Liability for improper advertising. The value of commercial advertising. Characteristics of good advertising. Types and functions of commercial advertising. Channels and means of trade advertising. The essence of marketing communications. Complex marketing communications. The role of advertising in the complex marketing communications. Target Audience. Different states of purchasing. Features of advertising. Parts of advertising. A creative approach to advertising. Formation of advertising appeal. Terms of advertising. Organization of promotional activities in agriculture. The basic approaches for designing advertising budget. Advertising agency and advertising company. The concept of “public relations”. Differences: promotion, advertising, “public relations”. Channels of “public relations”. Connection with public.

**Master Program “Management of logistics systems”**

**Managing logistics systems.** Logistics as a factor in increasing competitiveness. Functional logistics. The basic premise of practical use of the basic principles in logistic systems (economic, informational, technical and organizational). Systems approach to logistics. Logistic systems and principles of their formation. Classification of logistic systems (micro and macro-logical systems). Links of logistic systems. Logistic network. Assessment of functioning and development of logistic systems. Principles of logistic

---

systems. The principle of total costs. Principle-wide optimization. The principle of modeling. The principle of total quality management. The principle of sustainability. The principle of adaptability. Prediction of logistic systems. Cybernetic approach to logistics. Systems analysis as the primary method of reasoning and decision-logistics solutions. Simulation of logistics. Optimization of logistic solutions. Effectiveness of logistic systems. Examples of effective functioning of logistic systems.

**Managing sales and deliveries.** The essence of the process of supply and marketing. The concept of subjects and objects of supply and marketing activities and their interaction. Necessity of marketing approach to procurement and sales. Criteria for selection of suppliers and buyers. Characteristics of suppliers and buyers and risk factors at choosing suppliers and buyers. Sources of information about the suppliers and buyers. Lack of information and ways to overcome it. Procurement Strategy: one or more suppliers, methods of orders among suppliers. Effect of geographic location and size of the supplier and the buyer to make a decision about his choice. Stages of the process of supply and marketing. Strategic and operational and technical control of the supply and marketing. Information infrastructure procurement and sales and marketing information system.

**Management in competitiveness of agricultural products.** External and internal factors affecting the competitiveness of products and businesses. Terms of competitiveness. Organizational measures improving the competitiveness of the enterprise. Technology of creating competitive advantages. Classification and nature of basic management competitive advantages. Criteria for ranking competitors. Determination of market size. Structure of competitiveness. Competitiveness of the goods at the market economy. Relationship of use-value, price and product competitiveness. Image and informative product. Strategy in quality management. Ways to improve the competitiveness of the goods. Milestones of competitiveness evaluation. The importance of indicators in integrated assessment system. Integral indicators of competitiveness.

**Methods and quality management system.** Quality as a management object. System of quality management. The emergence of statistical methods in management. Factors of quality products. The overall indicator of product quality. Models of quality. Functions of quality control. Integrated quality management (IQM). Estimated costs of quality model RAF. Applying functional cost analysis to development in product quality. Technical, economic and legal requirements of the standards. Objects of standardization. Key elements and categories of the current system of standardization. The system of international standards. Structure of the set of standards ISO 9000:2000. Nature and types of certification. Methodological basis of certification in Ukraine. Procedure of certification in UkrSEPRO. Voluntary product certification. International practice of certification. The main stages of project reengineering. The process of benchmarking. Three-phasic approach to setting the nominal parameter values and process and product tolerances on them.

**Infrastructure Management AIC.** Infrastructure APC is a component of market infrastructure and development depend on its proposed service, and the consumer market as a whole. Requirements for agricultural infrastructure, its general configuration of individual elements and the system management by local authorities, as international experience shows that a prerequisite for the effectiveness of market-oriented economy is the development of agricultural infrastructure.

*Research oriented disciplines*

**Master program “Theory and practice of management at agricultural enterprises”**

**Psychology in Management.** Psychology in management as a science. Object, subject and methods of psychology in management. The term “system” and “structure” as a model of the object in the field of psychology of management. General psychological

---

characteristic activity. Psychological laws in management. Psychology of leadership. The authority in the control system. Interaction in a group. Group phenomena. Psychological foundations of communication. Conflict in the field of psychology in management. The dynamics of the conflict. Social impact and its tools.

**Axiology and career of the manager.** Career: basic concepts, structure, content. Historical analysis career as a social phenomenon. Exploring career as a control object. Classification and typology of career. Stages and stage career. Foreign experience in managing career. Analytical analysis of factors career. System factors involved in the formation of career. Socio-biographical factors influencing career. Gender and career. Social status and education. Location career in the value system of the person. General career development of women. Women look at the business. Role conflict of working women. Features career of women-entrepreneurs. Women and men in science. Psychological characteristics in planning the career of leader. Models of professional promotion specialist. Professional career at civil servant. Career development as strategies of the individual. Choosing a career. Preparation of personal career. Typology of a career manager. The principles of successful management in career at the organization. Strategy of career development. Guidelines on career planning. System service and professional advancement. Leadership training program. The formation of personnel reserve. Stages of work on reserve.

**Science and practice of decision-making.** Classification of management decisions and conditions to ensure the effectiveness. Ensuring comparability of alternative versions of management decisions. Taking into account the risk and uncertainty in management decisions. The essence of the economic laws at market economy. The essence of law. Scientific approaches to the formation of competitive solutions. Features and rules of a systematic approach. Principles of objects. Stages of development decisions. Information management solutions. Design and implementation of solutions. The essence and principles of analysis. Techniques and methods of analysis. The method of chain substitutions. Analysis of factors using a computer. The balance methods. SWOT-analysis. Principles of forecasting. Extrapolation and parametric methods. Expert methods. The organization of works for prediction.

**Infrastructure Management AIC.** Infrastructure APC is a component of market infrastructure and development depending on its proposed service, and the consumer market as a whole. Requirements for agricultural infrastructure, its general configuration of individual elements and the system management by local authorities, as international experience shows that a prerequisite for the effectiveness of market-oriented economy is the development of agricultural infrastructure.

**Managing logistic systems.** Logistics as a factor in increasing competitiveness. Functional logistics. The basic premise of practical use of the basic principles of logistic systems (economic, informational, technical and organizational). Systems approach to logistics. Logistic systems and principles of their formation. Classification of logistic systems (micro and macro-logistic systems). Link in logistic systems. Logistic network. Assessment of functioning and development of logistic systems. Principles of logistic systems. The principle of total costs. Principle-wide optimization. The principle of modeling. The principle of total quality management. The principle of sustainability. The principle of adaptability. Prediction of logistic systems. Cybernetic approach to logistics. Systems analysis as the primary method of reasoning and decision-logistic solutions. Simulation of logistics. Optimization of logistic solutions. Effectiveness of logistic systems. Examples of effective functioning of logistic systems.

**Master Training  
in specialty “VETERINARY MEDICINE”  
Branch of knowledge “Veterinary Medicine”**

**Form of training, licensed number of students:**

– full-time	70
<b>Term of study</b>	<b>2 years</b>
<b>Credits</b>	<b>120 ECTS</b>
<b>Language of teaching</b>	<b>Ukrainian, Russian</b>
<b>Qualification of graduates</b>	<b>Doctor of Veterinary Medicine</b>

**The concept of training**

Master programmers are directed to providing agro-industrial complex AR of Crimea and the south of Ukraine competitive doctors of the veterinary medicine, possessing professional competences and qualities necessary in veterinary medicine and capable to use the methods of natural and socioeconomic factors in the development of animal diseases which are the most spread in the territory of the Ukrainian south, to carry out their correction and preventive actions to prevent infectious, parasitic and noninfectious pathologies, to carry out all-improving actions to form healthy livestock, to make recommendations on feeding, to estimate effectiveness of the dispensary observation for healthy and sick animals, to be able to use correctly the medico-technical and veterinary equipment, tools and inventory for laboratory, diagnostic and medical purposes, and also to carry out clinical researches of animals, to treat animals according to the obtained diagnosis, and to carry out prophylaxis, diagnostics and treatment of animals. To collect scientific information, to review materials and summaries, to make up abstracts and reports, bibliographies, to participate in scientific discussions and protection of scientific works of various level, to have talks on conducted researches, to analyze domestic and foreign experience on the research direction, to develop plans, programmers and techniques of carried out scientific researches, to conduct scientific researches and experiments, to participate in the development of modern theoretical and the experimental technique and to introduce results.

**Production oriented master program**

***Master program “Veterinary guarantee of cattle, sheep and goat breeding”***

The program increases knowledge and forms skills to define the morphofunctional status of organism in cattle, sheep and goats, to determine the regularities of pathogenesis and application of methods of express diagnostics at diseases of various etiology, from early diagnostics, treatment and prophylaxis of infectious and noncontagious diseases in cattle, sheep and goats.

**Sphere of graduates employment**

Master graduates can obtain the following positions according to the received qualification: doctor of clinic veterinary medicine, microbiologist, doctor-epizootologist, doctor-parasitologist, immunologist, doctor-pathomorphologist.

***Master program “Veterinary guarantee of horse breeding”***

The master program provides the formation of knowledge and acquisition of abilities in diagnostics, treatment and prophylaxis of obstetric and gynecologic, surgical, invasive and parasitic, infectious diseases of horses, and also diagnostics, development and

---



introduction of treatment and prophylaxis methods of internal noncontagious diseases in horses and veterinary and sanitary evaluation of foodstuff in horse breeding.

### **Sphere of graduates employment**

The doctor of veterinary medicine at agricultural enterprises in the field of horse breeding, the doctor of veterinary medicine at the enterprises and establishments of veterinary medicine, the doctor of veterinary medicine, the doctor of veterinary medicine at meat- and the milk-processing enterprises, the doctor of veterinary medicine at biotechnological enterprises, the doctor or the chief physician of veterinary medicine, the researcher.

### ***Master program “Veterinary guarantee of health of dogs and cats”***

Main objective of the program is to increase knowledge and to form the following skills: to evaluate pathophysiological and morphological changes at various pathology in dogs and cats; to take diagnostics, treatment and prophylaxis of the most widespread obstetric and gynecologic diseases of small animals, to know the principles of obstetric and gynecologic medical examination; to take diagnostics, treatments and prophylaxes of the most widespread surgical diseases in dogs and cats (traumatology, orthopedics and ophthalmology); to take diagnostics, treatment and prophylaxis of the most widespread noncontagious diseases in dogs and cats. Studying etiology and pathogenesis of disturbance of immunologic reactivity, main metabolic disorders and justification of measures in pathogenetic therapy for small animals.

### **Sphere of graduates employment**

Masters can hold the following positions according to the received qualification: doctor of clinic veterinary medicine of small animals, microbiologist, doctor-epizootologist, doctor-parasitologist, immunologist, doctor- pathomorphologist.

### **Practical training**

Practical training is carried out at the educational, scientific and technological livestock centre, Regional state laboratory of veterinary medicine of AR of Crimea, on advanced farms, at regional and municipal enterprises of veterinary medicine, regional laboratories of veterinary medicine, laboratories of veterinary and sanitary inspection at trading enterprises, milk- and meat processing plants and other enterprises for processing livestock and poultry products.

### **Proposed Topics for Master Theses**

1. Evaluation of the organism morfofunctional status of calves, lambs and goats depending on the level of their prenatal development and viability.
  2. Diagnostics of multiorgan pathology in cattle, sheep and goats, pathomorphologic express diagnostics, differential patomorphology.
  3. Early diagnostics and preventive therapy of metabolism diseases in cattle, sheep and goats taking into account internal pathology.
  4. Development of modern methods of prophylaxis at traumatism and surgical treatment of gynecologic pathology in cattle, sheep and goats.
  5. Perfecting and justification of diagnostics and nonspecific prophylaxis methods of infectious and invasive diseases in cattle, sheep and goats.
  6. Etiology, pathogenesis and pathogenetic therapy of metabolic disorder in the horse organism.
  7. Application of the modern diagnostics and treatment methods at traumatology and orthopedics in horses.
-

**MASTER DEGREE PROGRAMS**

8. Modern methods of diagnostics, treatment and antiepzootic actions at infectious diseases in horses.

9. Application of modern diagnostics and treatment methods at the diseases of reproductive organs in dogs (or cats).

10. Application of the modern diagnostics and treatment methods at traumatology and orthopedics in small animals.

11. Treatment and prophylaxis of surgical infection in animals.

12. Application of the modern diagnostics and treatment methods of metabolic disorders in small animals.

**Academic rights of applicants for a master program**

Except the specialty “Veterinary Medicine” (according to the types) the Bachelors in “Veterinary Medicine” have the possibility to continue their study in the following specialties in the **branch of knowledge 1801 “Specific categories”**:

- 8.18010010 – “Quality, standardization and certification”,(see p.176);
- 8.18010021 – “Pedagogy of Higher School”(see p. 434);
- 8.18010018 – Administrative management (see p. 397);
- 8.18010020 – “Educational Institution Management” (see p. 427)

**Curriculum for specialist training of the educational and qualification level “Master” in specialty “Veterinary Medicine”**

№	Discipline, practice	Semester	Volume		
			hours	Credits	
				national	ECTS
<b>1. REGULATORY ACADEMIC DISCIPLINES</b>					
<i>1.1. Cycle of humanitarian, social and economic training*</i>					
1	Philosophy of science and innovation development	1	72	1,3	2,0
2	Foreign language in the professional activity	1	54	1,0	1,5
3	Information technologies in veterinary medicine	1	54	1,0	1,5
<i>Total number</i>			180	3,3	5,0
<i>1.2. Cycle of natural science (fundamental) training*</i>					
1	Comparative morphology, special pathomorphology and judicial veterinary medicine	1	90	1,67	2,5
2	Veterinary legislation of Ukraine and international veterinary law	1	90	1,67	2,5
3	Methodology of scientific researches	1	90	1,67	2,5
<i>Total number</i>			270	5,0	7,5
<i>1.3. Cycle of professional and practical training*</i>					
1	Obstetrics, gynecology and biotechnology reproduction of animals	2	108	2,0	3,0
2	Special propedeutics, therapy and prophylaxis of internal diseases of animals	2	126	2,33	3,5
3	Surgical diseases of animals with anesthesiology	2	108	2,0	3,0
4	Special epizootology	2	108	2,0	3,0
5	Global parasitology	2	108	2,0	3,0
<i>Total number</i>			558	10,3	15,5
Total according to regulatory part			1008	18,7	28,0
<b>2. ELECTIVE ACADEMIC DISCIPLINES</b>					
<b>2.1. Disciplines chosen by University</b>					
<i>2.1.1. Cycle of humanitarian, social and economic training*</i>					
1	Philosophy of science and innovation development	1	36	0,67	1,0
2	Foreign language in the professional activity	1	36	0,67	1,0
3	Information technologies in veterinary medicine	1	36	0,66	1,0
<i>Total number</i>			108	2,0	3,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	Credits	
				national	ECTS
<b>2.1.2. Cycle of natural science (fundamental) training*</b>					
1	Comparative morphology, special pathomorphology and judicial veterinary medicine	1	54	1,0	1,5
2	Veterinary legislation of Ukraine and international veterinary law	1	54	1,0	1,5
3	Methodology of scientific researches	1	36	0,7	1,0
<i>Total number</i>			144	2,7	4,0
<b>2.1.3. Cycle of professional and practical training*</b>					
1	Obstetrics, gynecology and biotechnology reproduction of animals	2	72	1,3	2,0
2	Special propedeutics, therapy and prophylaxis of internal diseases of animals. Global parasitology	2	54	1,0	1,5
3	Surgical diseases of animals with anesthesiology	2	54	1,0	1,5
4	Special epizootology	2	54	1,0	1,5
5	Global parasitology	2	54	1,0	1,5
<i>Total number</i>			288	5,3	8,0
<i>Total chosen by university</i>			540	10,0	15,0
<b>2.2. Disciplines chosen by students</b>					
<b>2.2.1. Cycle of humanitarian, social and economic training*</b>					
1	Foreign language in the professional activity	1	54	1,0	1,5
2	Information technologies in veterinary medicine	1	54	1,0	1,5
<i>Total number</i>			108	2,0	3,0
<b>2.2.2. Cycle of natural science (fundamental) training*</b>					
1	Comparative morphology, special pathomorphology and judicial veterinary medicine	1	54	1,0	1,5
2	Veterinary legislation of Ukraine and international veterinary right	1	54	1,0	1,5
3	Methodology of scientific researches	1	54	1,0	1,5
<i>Total number</i>			162	3,0	4,5
<b>2.2.3. Cycle of professional and practical training*</b>					
1	Obstetrics, gynecology and biotechnology reproduction of animals	2	54	1,0	1,5
2	Special propedeutics, therapy and prophylaxis of internal diseases of animals. Global parasitology	2	54	1,0	1,5
3	Surgical diseases of animals, with anesthesiology	2	54	1,0	1,5
4	Special epizootology	2	54	1,0	1,5
5	Global parasitology	2	54	1,0	1,5
<i>Total number</i>			270	5,0	7,5
<b>Production oriented disciplines</b>					
<b>Master program "Veterinary guarantee of cattle, sheep and goat breeding"</b>					
1	Clinical morphology and physiology of cattle, sheep and goats	1,2,3,4	288	5,33	8,0
2	Obstetrics, gynecology and biotechnology reproduction of cattle, sheep and goats	1,2,3,4	288	5,33	8,0
3	Special propedeutics, therapy and prevention of the diseases of cattle, sheep and goats	1,2,3,4	288	5,33	8,0
4	Surgical diseases of cattle, sheep and goats	1,2,3,4	288	5,33	8,0
5	Invasive disease of cattle, sheep and goats	1,2,3,4	288	5,33	8,0
6	Infectious disease of cattle, sheep and goats	1,2,3,4	288	5,33	8,0
7	Innovative technologies of feeding, genetics and breeding of horses	1,2,3,4	108	2,0	3,0
<i>Total number</i>			1836	34,0	51,0
<i>Total selected by the students</i>			2376	44,0	66,0
<b>Master program "Veterinary guarantee of horse breeding"</b>					
1	Clinical morphology and physiology of horses	1,2,3,4	288	5,33	8,0
2	Obstetrics, gynecology and reproduction biotechnology horses	1,2,3,4	288	5,33	8,0
3	Special propedeutics, therapy and prevention of	1,2,3,4	288	5,33	8,0

**MASTER DEGREE PROGRAMS**

№	Discipline, practice	Semester	Volume		
			hours	Credits	
				national	ECTS
	the diseases of horses				
4	Surgical diseases of horses	1,2,3,4	288	5,33	8,0
5	Invasive and parasitic diseases of horses	1,2,3,4	288	5,33	8,0
6	Infectious disease of horses	1,2,3,4	288	5,33	8,0
7	Innovative technologies of feeding, genetics and breeding of horses	1,2,3,4	108	2,0	3,0
<i>Total number</i>			1836	34,0	51,0
<i>Total selected by the students</i>			2376	44,0	66,0
<b>Master programme "Veterinary guarantee of health of dogs and cats"</b>					
1	Clinical morphology and physiology of dogs and cats	1,2,3,4	288	5,33	8,0
2	Obstetrics, gynecology and reproduction biotechnology dogs and cats	1,2,3,4	288	5,33	8,0
3	Special propedeutics, therapy and prevention of diseases of dogs and cats	1,2,3,4	288	5,33	8,0
4	Surgical diseases of dogs and cats	1,2,3,4	288	5,33	8,0
5	Invasive disease of dogs and cats	1,2,3,4	288	5,33	8,0
6	Infectious diseases of dogs and cats	1,2,3,4	288	5,33	8,0
7	Innovative technologies of feeding, genetics and breeding of horses	1,2,3,4	108	2,0	3,0
<i>Total number</i>			1836	34,0	51,0
<i>Total selected by the students</i>			2376	44,0	66,0
Total number of elected part			2916	54,0	81,0
Practical training			288	5,3	8,0
Writing and defense of master's thesis			108	2,0	3,0
Total for specialty			4320	80,0	120,0

\*Cycles of disciplines according to the requirements of standards for higher education, approved later than 27.08.2010, EQC and OPP.

### **Annotations of disciplines in the curriculum**

#### **1. REGULATORY ACADEMIC DISCIPLINES**

##### *1.1. Cycle of humanitarian, social and economic training\**

**Philosophy of science and innovative development.** Introduction to the science in the classical and modern philosophical directions, and also philosophy and methodology of concrete sciences.

**Foreign language in professional activity.** Training students for efficient oral and written communication in their academic and professional environment, as one of the ways to achieve successes in professional activity.

**Informational technologies in veterinary medicine.** Theoretical and practical training students on creation and use of the uniform research informational project for the solution of a concrete professional task which includes complex hardware and software to obtain primary information, to process and analyze it for the purpose of obtaining qualitatively new information, preparing information for decision-making, registration of reports and visualization of data.

##### *1.2. Cycle of natural science (fundamental) training\**

**Comparative morphology, special pathomorphology and judicial veterinary medicine.** Studying morphological features of bodies and tissues of various animals, bases of pathomorphologic diagnostics and forensic veterinary medicine.

**Veterinary legislation of Ukraine and international veterinary law.** Studying regulation methods of veterinary business in Ukraine, monitoring performance of acts concerning with veterinary medicine, the organization of veterinary service in certain

foreign countries, international veterinary organizations, requirements of the legislation at EU and agreements in the Field of veterinary medicine.

**Methodology of scientific researches.** Studying the main forms of individual and collective scientific activity, definition of the role and value of scientific and technical information in scientific researches, assimilation of common matters of invention, rationalization and patent-and-license business.

*1.3. Cycle of professional and practical training\**

**Obstetrics, gynecology and biotechnology of reproduction of animals.** Studying how to conduct researches of reproductive system in females and males, to diagnose and to evaluate the animals, sick puerperal pathology, to carry out the analysis of effectiveness of therapy at gynecologic diseases.

**Special propedeutics, therapy and prophylaxis of internal diseases of animals.** Studying the knowledge on special propedeutics with the modern methodology of therapy and prophylaxis of internal diseases in animals, and also on decrease the food, used by people, ecologically dangerous and non-qualitative production of animal husbandry that is necessary to future experts of veterinary medicine.

**Surgical diseases of animals with anesthesiology.** Studying the rules of animal preparation to operations, fixing methods, and the ways of preparation of hands and surgery environment; the sequences of surgeries and their classification; the rules and measures of asepsis and the antiseptics used at surgery.

**Special epizootology.** Studying the epizootology, the MEB documents concerning with infectious diseases of animals, the measure and preventive actions, deep studying world-spread infectious diseases (SARS, sponge-like encephalopathy of cattle, highly pathogenic bird flu, the African pig plague), studying of emergent infectious diseases.

**Global parasitology.** Studying the distribution of parasitic diseases among animals of different types, the modern methods of laboratory diagnostics and effective methods of treatment, defining the level of characteristic individual and typological features, interests, abilities, belief and values according to available conditions of professional and ordinary activity.

**2. ELECTIVE ACADEMIC DISCIPLINES**

*2.1. Disciplines chosen by University*

*2.1.1. Cycle of humanitarian, social and economic training\**

**Philosophy of science and innovative development** (see p. 556)

**Foreign language in professional activity** (see p. 556)

**Informational technologies in veterinary medicine.** (see p. 556)

*2.1.2. Cycle of natural science (fundamental) training\**

**Comparative morphology, special pathomorphology and judicial veterinary medicine** (see p. 556)

**Veterinary legislation of Ukraine and international veterinary law** (see p. 556)

**Methodology of scientific researches** (see p. 557)

*2.1.3. Cycle of professional and practical training\**

**Obstetrics, gynecology and biotechnology of reproduction of animals.** Studying how to conduct researches of reproductive system organs in females and males, to diagnose and evaluate the animals, sick puerperal pathology, to analyze the effectiveness of therapy at gynecologic diseases.

**Special propedeutics, therapy and prophylaxis of internal diseases of animals.** Knowledge on special propedeutics with the modern methodology of therapy and prophylaxis of internal diseases in animals, and also on decrease the food, used by

people, ecologically dangerous and non-qualitative production of animal husbandry that is necessary to future experts of veterinary medicine.

**Surgical diseases of animals with anesthesiology.** Studying the rules of animal preparation to operations, fixing methods, and the ways of preparation of hands and surgery environment; the sequences of surgeries and their classification; the rules and measures of asepsis and the antiseptics used at surgery.

**Special epizootology.** Studying the epizootology, the MEB documents concerning with infectious diseases of animals, the measure and preventive actions, deep studying world-spread infectious diseases (SARS, sponge-like encephalopathy of cattle, highly pathogenic bird flu, the African pig plague), studying of emergent infectious diseases.

**Global parasitology.** Studying the distribution of parasitic diseases among animals of different types, the modern methods of laboratory diagnostics and effective methods of treatment, defining the level of characteristic individual and typological features, interests, abilities, belief and values according to available conditions of professional and ordinary activity.

## *2.2. Disciplines chosen by students*

### *2.2.1. Cycle of humanitarian, social and economic training\**

**Foreign language in professional activity** (see p. 556)

**Informational technologies in veterinary medicine** (see p. 556)

### *2.2.2. The cycle of natural-science (fundamental) training\**

**Comparative morphology, special pathomorphology and judicial veterinary medicine** (see p. 556)

**Veterinary legislation of Ukraine and international veterinary law** (see p. 556)

**Methodology of scientific researches** (see p. 557)

### *2.2.3. Cycle of professional and practical training\**

**Obstetrics, gynecology and biotechnology of reproduction of animals.** Studying how to conduct researches of reproductive system in females and males, to diagnose and to evaluate the animals, sick puerperal pathology, to carry out the analysis of effectiveness of therapy at gynecologic diseases.

**Special propedeutics, therapy and prophylaxis of internal diseases of animals.** Studying the knowledge on special propedeutics with the modern methodology of therapy and prophylaxis of internal diseases in animals, and also on decrease the food, used by people, ecologically dangerous and non-qualitative production of animal husbandry that is necessary to future experts of veterinary medicine.

**Surgical diseases of animals with anesthesiology.** Studying the rules of animal preparation to operations, fixing methods, and the ways of preparation of hands and surgery environment; the sequences of surgeries and their classification; the rules and measures of asepsis and the antiseptics used at surgery.

**Special epizootology.** Studying the epizootology, the MEB documents concerning with infectious diseases of animals, the measure and preventive actions, deep studying world-spread infectious diseases (SARS, sponge-like encephalopathy of cattle, highly pathogenic bird flu, the African pig plague), studying of emergent infectious diseases.

**Global parasitology.** Studying the distribution of parasitic diseases among animals of different types, the modern methods of laboratory diagnostics and effective methods of treatment, defining the level of characteristic individual and typological features, interests, abilities, belief and values according to available conditions of professional and ordinary activity.

*Production oriented disciplines*

**Master programs “Veterinary guarantee of cattle, sheep and goat breeding”, “Veterinary Guarantee of Horse Breeding”, “Veterinary Guarantee of Health of Dogs and Cats”**

**Clinical morphology and physiology of cattle, sheep, goats, horses, dogs and cats.** Formation of the knowledge on biological bases of functioning various organs and systems in cattle, sheep and goats depending on pedigree and age features, study of organizational ways of physiologically reasonable and efficient feeding in cattle, sheep and goats.

**Obstetrics, gynecology and biotechnology of reproduction of cattle, sheep, goats, horses, dogs and cats.** Formation of the knowledge on biological bases of functioning different organs and systems in cattle, sheep and goats depending on their age features, study of methods at obstetric and gynecologic diagnostics and treatment of pathology of reproductive organs in cattle, sheep and goats, formation of knowledge on etiology and pathogenesis of disturbance of reproductive function.

**Special propedeutics, therapy and prophylaxis of diseases of cattle, sheep, goats, horses, dogs and cats.** Study of diagnostics of the most widespread internal noncontagious diseases in cattle, sheep and goats, study of the methods of diagnostics, prophylaxis and treatment of diseases of internal organs.

**Surgical diseases of cattle, sheep, goats, horses, dogs and cats.** Study of the application methods of anesthesiology of cattle, sheep and goats, diagnostics and treatments of surgical infections, traumas, changes, surgical treatment of oncological diseases in cattle, sheep and goats.

**Invasive diseases of cattle, sheep, goats, horses, dogs and cats.** Formation of knowledge on etiology, pathogenesis, postmortem changes at invasive diseases in cattle, sheep and goats, study of the methods of complex diagnostics, prophylaxis, and treatment of such diseases.

**Infectious diseases of cattle, sheep, goats, horses, dogs and cats.** Formation of knowledge on etiology, pathogenesis, postmortem changes at infectious diseases in cattle, sheep and goats, study of the methods of complex diagnostics, prophylaxis, and treatment of such diseases.

**Innovative technologies of feeding, genetics and cultivation of cattle, sheep, goats, horses, dogs and cats.** Formation of deep innovative knowledge about demands of nutrients in forage, structure of forage, monitoring of full value of animal feeding. Breeds of cattle, sheep, goats, horses, dogs and cats, breeding of working dogs and domestic cats. Inbreeding in selections of animals, methods of preservation of the gene pool. Veterinary genetics.

---

**INTERNATIONAL COOPERATION OF NULES OF UKRAINE**

The curricula and programs of Master’s Degree training are compiled in accordance with requirements of Law of Ukraine “About higher education”. Their adaptation and conformity meet the requirements of U.S. and European systems of higher agricultural education. It is demonstrated by memoranda of mutual recognition with such universities:

– **memorandum of Understanding were signed with** Louisiana State University (USA) 1998, 2009, Iowa State University (USA) 1996, 1998, 2011, Humboldt University of Berlin (Germany) 2002, Ghent University (Belgium) 2002;

– **memorandum of Double-degree diploma** were signed with: Wageningen University (The Netherland), 2006 – “Environmental Sciences”, “Biotechnology”, “Management Economics and Consumer Studies”, Humboldt University of Berlin (Germany), 2002 – “Process and Quality Management”, Anhalt University of Applied Sciences (Germany), 2006 – Master of Food and Agribusiness (MFA), University of Applied Sciences Weihenstephan –Trisdorf (Germany), 2005 – Masters of Business Administration in Agriculture (MBA), Russian State Agrarian University – Moscow Timiryazev Agricultural Academy, 2012 – Master program, Warsaw University of Life Sciences (Poland), 2012 – Master program.

Also the NULES of Ukraine actively collaborates with other universities and educational institutions and they have signed the bilateral agreements about collaboration (Appendix 1).

**Table 1.**

<b>№ n/n</b>	<b>Country</b>	<b>Name of partner</b>	<b>Contacts</b>
1.	Austria	Danube University Krems	Vice-chancellor – Viktoria Weber e-mail: viktoria.weber@donau-uni.ac.at Web site: <a href="http://www.donau-uni.ac.at">http://www.donau-uni.ac.at</a>
2.	Austria	University of Natural Resources and Life Sciences, Vienna	Vice-chancellor – Prof. Dr. Martin H. Gerzabek, e-mail: Rektorat@boku.ac.at Web site: <a href="http://www.boku.ac.at">http://www.boku.ac.at</a>
3.	Austria	Institute of Microbiology, University of Innsbruck	Director of the institute– Prof. Dr. Heribert Insam Assistant director – Prof. Mag. Dr. Rosa Margesin Web site: <a href="http://www.uibk.ac.at">http://www.uibk.ac.at</a>
4.	USA	Dickinson State University	Chancellor – Dr. D.C. Coston, Vice-chancellor – Pattie Carr, e-mail: dsu.hawk@dickinsonstate.edu Web site: <a href="http://www.dickinsonstate.edu/">http://www.dickinsonstate.edu/</a>
5.	USA	Louisiana State University	Acting chancellor – Dr. William L. Jenkins e-mail: chancellor@lsu.edu: Web site: <a href="http://www.lsu.edu/">www.lsu.edu/</a>
6.	USA	Iowa State University	Chancellor – Steven Leath e-mail: sleath@iastate.edu Assistant dean – David Acker, e-mail :dacker@iastate.edu Web site: <a href="http://www.iastate.edu/">www.iastate.edu/</a>
7.	USA	Yale University School of Forestry and Environmental Studies	Director of Global Institute of sustainable development of Forestry – Chad Oliver (Chadwick Dearing Oliver),



**MASTER DEGREE PROGRAMS**

<b>№ п/п</b>	<b>Country</b>	<b>Name of partner</b>	<b>Contacts</b>
	USA	Global Institute of Sustainable Forestry of the Yale University School of Forestry and Environmental Studies	e-mail: chad.oliver@yale.edu Web site: http://www.yale.edu/
8.	USA	Case Western Reserve University	Chancellor – Barbara R. Snyder , Acting director – Marielena Maggio e-mail: marielena.maggio@case.edu Web site: international@case.edu Web site: http://www.case.edu/
9.	USA	The University of Missouri	Chancellor – Brady J. Deaton , e-mail : chancellor office@missouri.edu e-mail:visitus@missouri.edu Web site: http://www.missouri.edu/
	USA	Food and Agricultural Research policy Institute, University of Missouri - FAPRI)	Chancellor – Brady J. Deaton , e-mail : chancellor office@missouri.edu e-mail:visitus@missouri.edu Web site: www.fapri.org/
10.	USA	Arkansas State University	Chancellor – G. David Gearhart e-mail: chancell@uark.edu Веб-сайт: http://www.astate.edu/
11.	USA	University of Vermont, Rubenstein School of Environment and Natural Recourses	Mary Watzin Berlidton, Vermont Web site: www.uvm.edu/
12.	USA	The Pennsylvania State University	Chancellor – Amy Gutmann , e-mail: presweb@pobox.upenn.edu Vice-chancellor – Stephen J. MacCarthy Web site: www.psu.edu/
13.	USA	Oklahoma State University	Chancellor – Burns Hargis e-mail : outreach@okstate.edu Vice-chancellor – David Henneberry, Ph.D., e-mail: david.henneberry@okstate.edu Web site: www.okstate.edu/
14.	Belgium	Ghent University	Chancellor – Paul Van Cauwenberge, e-mail: guide@UGent.be Department of agrarian economy – Prof. Guido Van Huylenbroeck, e-mail: Guido.VanHuylenbroeck@rug.ac.be Web site: http://www.ugent.be/
15.	Belorussia	International Sakharov Environmental University	Chancellor – Doctor of Technological Sciences, Professor Semen Kurdas e-mail: rector@iseu.by Head of international department– Anna Korda e-mail: id@iseu.by Web site: http://www.iseu.by/
16.	Belorussia	Polessky State University	Chancellor – Doctor of Economics, Professor Konstantyn Shebeko Methodologist on international cooperation – Mykola Kulyk e-mail: n-kulik@tut.by Web site: http://www.psunbrb.by/

**MASTER DEGREE PROGRAMS**

<b>№ п/п</b>	<b>Country</b>	<b>Name of partner</b>	<b>Contacts</b>
17.	Bulgaria	AgroBioInstitute – Kostinbrod	Director– Prof. A. Atanassov e-mail: geneng@mtel.net Web site: <a href="http://www.agrobioinstitut.org">http://www.agrobioinstitut.org</a>
18.	Georgia	Agricultural University of Georgia	Chancellor – Lasha Gotsyrydze Vice-chancellor – Douglas Osborne e-mail: d.osborne@agruni.edu.ge Web site: <a href="http://www.4icu.org/">http://www.4icu.org/</a>
19.	Denmark	Asmildkloster agricultural Academy	Director – Dr. Keld Mikkelsen e-mail: info@folkecenter.dk Веб-сайт: <a href="http://www.folkecenter.net">http://www.folkecenter.net</a>
20.	India	Indian Agricultural Universities Association	General secretary– Dr. Riksh Pal Singh, e-mail: esiaua@yahoo.co.in Web site: <a href="http://www.iauaindia.org">www.iauaindia.org</a>
21.	Italy	University of Calabria	Web site: <a href="http://www.iscapi.org/">http://www.iscapi.org/</a>
22.	Italy	The University of Udine	Chancellor – Palazzo Florio e-mail: urp@uniud.it Web site: <a href="http://www.uniud.it">www.uniud.it</a>
23.	Kazakhstan	S.Seifullin Kazakh Agro Technical University	Chancellor – Akhilbek Kuryshbaev, e-mail: agun.rektor@gmail.com Director of department of international cooperation– Sara Kytaipekova, e-mail: saraorazbek@mail.ru Web site: <a href="http://www.kazatu.kz">www.kazatu.kz</a>
24.	Kazakhstan	Kazakh National Agrarian University	Chancellor – Tlektes Espolov. e-mail: info@kaznau.kz Web site: <a href="http://www.kaznau.kz/">http://www.kaznau.kz/</a>
25.	Canada	University of Guelph	President and Vice-chancellor – Alastair Summerlee, e-mail: president@uoguelph.ca Web site: <a href="http://www.uoguelph.ca">www.uoguelph.ca</a>
26.	China	Zhejiang Forestry University	Lin'an, Hangzhou, Zhejiang, China, 311300 Telephone:+86-571-63740030, Fax:+86-571-63740030 e-mail: <a href="http://en.zafu.edu.cn/">http://en.zafu.edu.cn/</a> Web site: <a href="http://www.en.zafu.edu.cn">www.en.zafu.edu.cn</a>
27.	China	Zhejiang Academy of Agricultural Sciences	Chancellor – Chen Jianping Assistant director – Meng Zhiqi, Xu Ziwei, Tao Yuezhi, Clerical office – Chen Xiaowen, e-mail: maggiechen512@163.com Web site: <a href="http://www.zaas.ac.cn">www.zaas.ac.cn</a>
28.	China	Peking Academy of Agricultural and Forestry Science of China	Director – Li Yun Fu, e-mail: zhangmaiqi@webcon-tech.com Web site: <a href="http://www.lgs.baafs.net.cn">www.lgs.baafs.net.cn</a>
29.	China	North-West Agricultural University, Yan Lin	President – Sun Qixin e-mail: ipo@nwsuaf.edu.cn Web site: <a href="http://www.nwafu.edu.cn/">http://www.nwafu.edu.cn/</a>
30.	China	North-East Agricultural University, Harbin	Chancellor – Li Qingzhang, e-mail: neauxcb@126.com Web site: <a href="http://www.neau.edu.cn">www.neau.edu.cn</a>

**MASTER DEGREE PROGRAMS**

<b>№ п/п</b>	<b>Country</b>	<b>Name of partner</b>	<b>Contacts</b>
31.	China	Zhejiang Academy of Agricultural Sciences of China	Tatiana Yuan e-mail: yuanaiping@mail.ru Clerical office – Chen Xiaowen, e-mail: maggiechen512@163.com Web site: www.zaas.ac.cn
32.	China	Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences	Assistant director – Xiaobing Liu, e-mail: xbxliu@yahoo.com Web site: www.english.neigae.cas.cn
33.	China	Chinese Academy of agricultural Sciences	Chancellor – Zhai Huqu, e-mail: studyincaas@caas.net.cn e-mail: international@caas.net.cn Web site: http://www.gscaas.net.cn
34.	Lithuania	Lithuanian University of Agriculture	Chancellor – Prof. dr. Antanas Maziliauskas, e-mail: antanas.maziliauskas@asu.lt Web site: www.asu.lt
35.	Moldova	Agricultural University of Moldova	Chancellor – Gheorghe Cimpoieş e-mail: info@uasm.md Vice-chancellor on international relations – Cristina Cosciug e-mail: c.cosciug@uasm.md Web site: www.uasm.md
36.	Germany	University of Applied Sciences Weihenstephan- Trisdorf	Chancellor – Prof. Hermann Heiler, e-mail: praesident@hswt.de Prof. Dr. Ralph Schlauderer e-mail: Ralf.schlauderer@hswt.de Web site: www.hswt.de
37.	Germany	Anhalt University of Applied Sciences	Chancellor – Dieter Orzessek, e-mail: praesident@hs-anhalt.de Sabine Thalmann e-mail: thalmann@wi.hs-anhalt.de Olena Kashtanova e-mail: kashtanova@loel.hs-anhalt.de E.Kashtanova@gmx.de Web site: www.hs-anhalt.com
38.	Germany	Technical University of Dresden	Chancellor – Wolf-Eckhard Wormser e-mail: kanzler@tu-dresden.de International department: e-mail: auslandsamt@mailbox.tu-dresden.de Web site: tu-dresden.de
39.	Germany	Martin Luther University, Halle-Wittenberg	International department e-mail: info@international.uni-halle.de Web site: www.uni-halle.de
40.	Germany	Humboldt University of Berlin	Chancellor – Jan-Hendrik Olbertz, e-mail: president@uv.hu-berlin.de Dean – Prof. Frank Ellmer e-mail: frank.ellmer@agrار.hu-berlin.de e-mail: dekan.lgf@agrар.hu-berlin.de Web site: www.hu-berlin.de
41.	Germany	Institute of Agricultural Development in Central and Eastern Europe, Halle	e-mail: info@leibniz-gemeinschaft.de Web site: http://www.leibniz-gemeinschaft.de/
42.	Germany	The German Farmers' Association	e-mail: presse@bauernverband.net Web site: http://www.bauernverband.de/
43.	Poland	AGH University of Science And technology, Poland	Chancellor – Prof. Tadeusz Słomka e-mail: dwz@agh.edu.pl Web site: http://www.agh.edu.pl/

**MASTER DEGREE PROGRAMS**

<b>№ n/n</b>	<b>Country</b>	<b>Name of partner</b>	<b>Contacts</b>
44.	Poland	Wroclaw University of Environmental and Life Sciences	Vice-chancellor – Prof. Dr. Hab. Alina Wieliczko e-mail: rektor@up.wroc.pl Web site: http://up.wroc.pl
	Poland	Industrial Institute of Agricultural Machinery, Poznan	Director – Tadeusz Pavlovski, e-mail: office@pimr.poznan.pl Web site: http://www.pimr.poznan.pl/
45.	Poland	Warsaw University of Life Sciences	Chancellor – Prof. Alojzy Szymański, Vice-chancellor – Kazimierz Banasik e-mail: Banasik@alpha.sggw.waw.pl e-mail: kazimierz_banasik@sggw.pl Web site: http://spin.sggw.pl
		Faculty of Applied Informatics and Mathematics Warsaw University of Life Sciences SGGW	
46.	Poland	<i>High School of Ecology and Management in Warsaw</i>	President – prof. Jan Misiak Chancellor – doc. dr Monika Madej e-mail: rektorat@wseiz.pl Web site: http://www.wseiz.pl/
47.	Poland	Department of Warsaw Polytechnic, Plotsk	Chancellor – Prof. Jan Szmidt e-mail: jmr@rekt.pw.edu.pl Prof. – Krzysztof Lewenstein e-mail: prorektor.studia@rekt.pw.edu.pl Web site: http://www.pw.edu.pl/
48.	Poland	West Pomeranian University of Technology, Szczecin	Chancellor – Prof., PhD Edward Włodarczyk e-mail: rektor@univ.szczecin.pl Web site: http://www.zut.edu.pl/
49.	Poland	Institute for Building, Mechanization and Electrification of Agriculture	Director – prof. Andrzej Myczko e-mail: amyczko@man.poznan.pl
50.	Poland	Politechnika Opolska	Chancellor – prof. dr hab. inż. Marek Tukiendorf, e-mail: rektor@po.opole.pl Web site: http://www.po.opole.pl/
51.	Poland	University of Life Sciences in Lublin	Chancellor – Marian Wesółowski, e-mail: biuro.rektora@up.lublin.pl Web site: http://www.up.lublin.pl/
52.	Poland	Military University of Technology in the name of Jaroslaw Dabrowski	Chancellor – Zygmunt Mierczyk e-mail: zygmunt.mierczyk@wat.edu.pl Web site: http://www.istc.ru/
53.	Poland	Czestochowa University of Technology	Chancellor – Prof. Maria Nowicka-Skowron e-mail: rektor@adm.pcz.czyst.pl Vice-chancellor of educational department – Prof. Andrzej Rusek e-mail: d_nauczania@adm.pcz.czyst.pl Web site: http://www.pcz.pl/
54.	Poland	University of Rzeszow	Chancellor – Prof. Aleksander Bobko email: rektorur@univ.rzeszow.pl Vice-chancellor – Prof. Sylwester Czopek e-mail: prorektordsnauki@univ.rzeszow.pl Web site: http://www.univ.rzeszow.pl/en
55.	Russia	Saratov State Agrarian University named after N.I. Vavilov	Chancellor – Mykola Kuznetsov e-mail: rector@sgau.ru Web site: http://www.sgau.ru/

**MASTER DEGREE PROGRAMS**

<b>№ п/п</b>	<b>Country</b>	<b>Name of partner</b>	<b>Contacts</b>
56.	Russia	Stavropol State Agrarian University	Chancellor – Volodymyr Tryhachev e-mail: rector@stgau.ru Web site: <a href="http://www.stgau.ru/">http://www.stgau.ru/</a>
57.	Russia	Krasnoyarsk State University	Chancellor – Mykola Tsyhlenok e-mail: info@kgau.ru Web site: <a href="http://www.lan.krasu.ru">www.lan.krasu.ru</a>
58.	Russia	Kalmyk State University	Chancellor – Badma Salaiev Director – Herman Borlikov e-mail: interoffice@kalmsu.ru Web site: <a href="http://www.kalmsu.ru/">http://www.kalmsu.ru/</a>
59.	Russia	State University Of Land Use Planning	Chancellor – Sergey Volkov Vice-chancellor on international activity – Vasyl Nylypovskiy Василь e-mail: info@guz.ru Web site: <a href="http://www.guz.ru">www.guz.ru</a>
60.	Russia	Murmansk State Technical University	Chancellor – Olexander Yershov e-mail: ErshovAM@mstu.edu.ru Web site: <a href="http://www.mstu.edu.ru">www.mstu.edu.ru</a>
61.	Russia	Moscow state academy of veterinary medicine and biotechnology named K.I. Skryabin	Chancellor – Fedir Vasylevych e-mail: rector@mgavm.ru Web site: <a href="http://www.mgavm.ru">www.mgavm.ru</a>
62.	Russia	Kazan State Academy of Veterinary Medicine	Chancellor – Galymzyan Kabyrov Vice-chancellor on educational activity – Ali Volkov e-mail: study@ksavm.senet.ru Веб-сайт: <a href="http://www.ksavm.senet.ru">www.ksavm.senet.ru</a>
63.	Russia	<i>Southern Scientific Center of Russian Academy of Sciences, Astrakhan State Technical University</i>	Chancellor – Yuriyi Pimenov e-mail: astu@astu.org Web site: <a href="http://www.astu.org">www.astu.org</a>
64.	Russia	<i>Russian State Agrarian University - Moscow Timiryazev Agricultural Academy (All-Russia Research Institute of Electrification of Agriculture (Moscow))</i>	Chancellor – Volodymyr Bautin e-mail: rector@timacad.ru Web site: <a href="http://www.timacad.ru/">http://www.timacad.ru/</a>
65.	Russia	St. Petersburg Electrotechnical University named after V.I. Ulyanov	Chancellor – Volodymyr Kutuzov e-mail: VMKutuzov@etu.ru Web site: <a href="http://www.eltech.ru">www.eltech.ru</a>
66.	Russia	Moscow Technical University of Communications and Informatics	Chancellor – Artem Ajemov Main Vice-chancellor – E. Tytov e-mail: ird@mtuci.ru Web site: <a href="http://www.mtuci.ru">www.mtuci.ru</a>
67.	Russia	Yaroslavl State Agricultural Academy	Chancellor – Petro Dugin e-mail: agroacad@yaroslavl.ru Web site: <a href="http://www.cnshb.ru/">http://www.cnshb.ru/</a>
68.	Russia	Ural State Agricultural Academy	Chancellor – Iryna Donnyk e-mail: rector@usaca.ru Web site: <a href="http://www.usaca.ru">www.usaca.ru</a>

**MASTER DEGREE PROGRAMS**

<b>№ п/п</b>	<b>Country</b>	<b>Name of partner</b>	<b>Contacts</b>
69.	Russia	State Scientific Centre of Russia Russian ERI of Plant named after M. I. Vavilov	General director – Prof. Dzyubenko Nikolay e-mail: n.dzyubenko@vir.nw.ru Web site: <a href="http://www.vir.nw.ru/">http://www.vir.nw.ru/</a>
70.	Slovak Republic	Slovak Agricultural University in Nitra	Chancellor – Dr. prof. Peter Bielik Vice-chancellor on international and society relations – prof. Dr. Ing. Elena Horska e-mail: elena.horska@gmail.com Web site: <a href="http://www.uniag.sk/en/">http://www.uniag.sk/en/</a>
71.	Saudi Arabia	Qassim University	Chancellor – Khalid bin Abdulrahman Al-Hamoudi e-mail: khamoudi@qu.edu.sa Vice-chancellor – Prof. Abdul Moneim Bin Ibrahim Al-Moneim e-mail: vpqu@qu.edu.sa Web site: <a href="http://www.qu.edu.sa/en">http://www.qu.edu.sa/en</a>
72.	Tajikistan	Tajik Agrarian University	Chancellor – Satorri Izatullo Vice-chancellor on international relations – Tura Kodyrov e-mail: rectortau31@mail.ru Web site: <a href="http://www.tajagroun.tj/">http://www.tajagroun.tj/</a>
73.	Tajikistan	Tashkent Institute of Irrigation and Agricultural Mechanization Engineers	Chancellor – Уктам П. Умурзаков Main Vice-chancellor on Educational activity – D. e. s. U. Umurzakov. e-mail: admin@tiim.uz Web site: <a href="http://tiim.uz/">http://tiim.uz/</a>
74.	Hungary	Agricultural Technical Institute, Godollo	Director – Prof. Dr. Laszlo Fenyvesi e-mail: fenyvesi.laszlo@gmgi.hu e-mail: mgi@gmgi.hu Web site: <a href="http://www.fvmmi.hu/">http://www.fvmmi.hu/</a>
75.	Hungary	Szent Istvan University, Godollo	Chancellor – Laszlo Solti Vice-chancellor on international relations – Erika Michéli e-mail: micheli.erika@mkk.szie.hu e-mail: international@szie.hu Web site: <a href="http://sziu.hu/">http://sziu.hu/</a>
76.	France	Association “Friendship without borders”, Paris	Co-president – Hélène Maury e-mail: raymondiereweb@orange.fr Patrick Raballand e-mail: patrick.raballand@laposte.net
77.	France	Federation Exchanges France Ukraine	Co-president of “OFU” Federation, person in chsrge of cooperation department – Jacque Forzheron e-mail: fefu.adm@gmail.com Web site: <a href="http://www.fefu.org/">http://www.fefu.org/</a>
78.	France	FESIA “Lille”	Director – Denis Reymond Web site: <a href="http://www.fesia.org/">http://www.fesia.org/</a>
79.	France	National Graduate School of agronomic education, Tuluzy	Director – Lakiez Brijit e-mail: enfa@educagri.fr Web site: <a href="http://www.enfa.fr/">http://www.enfa.fr/</a>
80.	France	National Veterinary School of Agriculture and Food Industry	Director – Pierre Sai e-mail: Contact@oniris-nantes.fr Web site: <a href="http://www.oniris-nantes.fr/">http://www.oniris-nantes.fr/</a>
81.	France	Polytechnical Institute, LaSalle	President – Philippe Choquet e-mail: Philippe.Choquet@lasalle-beauvais.fr

MASTER DEGREE PROGRAMS

No n/n	Country	Name of partner	Contacts
			Web site: <a href="http://www.lasalle-beauvais.fr">www.lasalle-beauvais.fr</a>
82.	France	University of Louis Pasteur	Renee Heim Chemin du fraissinet e-mail: <a href="mailto:Legta.la-canourgue@educagri.fr">Legta.la-canourgue@educagri.fr</a> Web site: <a href="http://www.unistra.fr/">http://www.unistra.fr/</a>
83.	France	Institute for Radiation Protection and Nuclear Safety	Web site: <a href="http://www.irsn.fr/">http://www.irsn.fr/</a>
84.	France	Group ESA (Higher Agricultural School)	Person in charge of foreign students selection – Catherine Pellier e-mail: <a href="mailto:c.pellier@groupe-esa.com">c.pellier@groupe-esa.com</a> Web site: <a href="http://www.groupe-esa.com/">http://www.groupe-esa.com/</a>
85.	Czech Republic	Czech University of Life Sciences, Prague	Chancellor – Balík Jiří, prof. Ing. CSc. e-mail: <a href="mailto:balik@af.czu.cz">balik@af.czu.cz</a> Vice-chancellor on international relations Lošťák Michal, doc. PhDr. Ph.D. e-mail: <a href="mailto:lostak@pef.czu.cz">lostak@pef.czu.cz</a> Web site: <a href="http://pef.czu.cz/">http://pef.czu.cz/</a>
86.	Czech Republic	Mendel University in Brno	Chancellor – Jaroslav Hlusek e-mail: <a href="mailto:info@mendelu.cz">info@mendelu.cz</a> Web site: <a href="http://www.mendelu.cz/">http://www.mendelu.cz/</a>
87.	Czech Republic	IFER- Monitoring and Mapping Solutions	e-mail: <a href="mailto:info@ifer.cz">info@ifer.cz</a> Web site: <a href="http://www.ifer.cz/">http://www.ifer.cz/</a>
88.	Czech Republic	Scientific Research Institute of Agricultural Technology, Prague	e-mail: <a href="mailto:vuzt@vuzt.cz">vuzt@vuzt.cz</a> Web site: <a href="http://www.vuzt.cz/">http://www.vuzt.cz/</a>
89.	Croatia	University of Zagreb	Chancellor – prof. dr. Aleksa Bjeliš e-mail: <a href="mailto:rector@unizg.hr">rector@unizg.hr</a> Reception room – Katarina Prpić, prof. e-mail: <a href="mailto:katarina.prpic@unizg.hr">katarina.prpic@unizg.hr</a> Web site: <a href="http://www.unizg.hr/">http://www.unizg.hr/</a>
90.	Japan	Tokyo University of Agriculture	President – Ohsawa Kanju e-mail: <a href="mailto:isf@nodai.ac.jp">isf@nodai.ac.jp</a> Web site: <a href="http://www.nodai.ac.jp/">http://www.nodai.ac.jp/</a>

### International Programmes for Student Practical Training

Students and PhD students of the University have practical training not only at the own bases, at leading agricultural enterprises and farms of Ukraine, but also abroad. Main international programmes of the student practical training are the following (Table 1).

- **Programmes of seasonal agricultural works in EU countries** – Germany, Switzerland, Austria, Czech republic;
- **International programmes on gaining farming experience:** programme for production internship of students and farmers at the big enterprises of the western Lands of Germany (**German Rural Association**); programme of Farmers Association of Denmark; **Karl Hof's Farm** – program of practical training through Germany's scheme of permissions for students of agricultural European universities; **ATLANTIS** – programme of practical training at agricultural enterprises and enterprises on procession of Norway agricultural products, etc.;
- **Programmes of the International Farm Organizations: Amitie-Sans Frontieres** (Friendship Without Borders, France) - programme of the association of Poitu Charon

## MASTER DEGREE PROGRAMS

with the regional council and agricultural chamber support; **Fédération Echanges France Ukraine** (Federation “France – Ukraine exchanges) – program of French farmers association. **AGROIMPULSE** – internship programme coordinated by the Swiss Union; Agency of agricultural youths exchanges and educational programmes of the Netherlands and others;

- **Internship (training) programmes at the partner-universities of foreign countries at support of international organizations:** **MAST** – Minnesota State University (USA); Agency of agricultural youth exchange and educational programmes of Kingdom of Netherlands etc. Master Program of studying in Anjers University (France) etc.

In general, for the last 10 years, achievements of the National University of Life and Environmental Sciences of Ukraine in the development of the practical component in training specialists abroad are:

- 860 scientific-pedagogical staff had internship (training) at partner-universities in the framework of joint programs (projects) and participated in international conferences;
- More than 600 students and PhD students had internship (training) at the foreign partner-universities in exchange programmes;

6500 students had educational and production practical training in the countries of Western Europe and Northern America.

The bilateral agreements on collaboration signed by companies

№	Country	Name of partner
1	Austria	Ing. Friedrich Bauer GmbH
2	USA	American and Ukraine Trade Corporation
3	USA	National Center for Food and Agricultural Policy (NSFAP) (Washington)
4	USA	Company «Pioneer Hi-Bred Int'l Inc» (Zhakson)
5	USA	eXtension Foundation
6	Great Britain and Northern Ireland	«European Ventures» LTD
7	Denmark	Company Cheminova (Harbour)
8	Dominican Republic	Chamber of Commerce and Production
9	Germany	Company WESER-CHAMPIGNON (Chesysch-Oldendorf)
10	Germany	CLAAS Global Sales GmbH
11	Germany	Regional Eastern European Fire Monitoring Center
12	Poland	Company Zakłady Chemiczne 'Organika-Sarzyna' S.A.
13	Russia	Federal Centre for Toxicological, Radiological and Biological Safety of Animals
14	Turkey	Company Koruma Group
15	Hungary	Research Institute for Fisheries, Aquaculture and Irrigation (HAKI), Szarvas
16	Company	Company AMAKO
17	Company	Representative office of AGCO Corporation in Ukraine
18	Finland	Company “LEIPURIN” (Vantaa)
19	Czech Republic	Company “BRUNNTHALLER” (Prague)
20	Czech Republic	Company BENEKOV

### Mobility of students of NULES of Ukraine

Country	Higher Educational Institutions	Name of program
Austria	International Institute for Applied Systems Research	Marie Curie Mobility Program
Belgium	Ghent University	Economics
Greece	Mediterranean Agronomic Institute of Chania	Economics of Agriculture



**MASTER DEGREE PROGRAMS**

China	Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences	Soil Science
Netherland	Wageningen University	“ Environment ”, “Biotechnology”,
Germany	University of Applied Sciences Weihenstephan-Trisdorf	MBA
Germany	Anhalt University of Applied Sciences	MFA
Germany	Humboldt University of Berlin	Process control and quality management
		Economics
		Postgraduate studies
Germany	University of Bonn	Management
Norway	School of Architecture and Design	Landscape Management
Poland	Warsaw University of Life Sciences	Economics of Agriculture
Romania	University of Agricultural Sciences and Veterinary Medicine	Management in Agriculture
Slovakia	Slovak Agricultural University	Business Economics
USA	Chadron College	Management
USA	Iowa State University	Management in Agriculture
Hungary	Szent Istvan University, Godollo	Management
France	University of Louis Pasteur	«Water Bioresources»
France	Higher Agricultural School of Angers	Economics and Management
Czech Republic	Czech University of Life Sciences, Prague	International Economics
Czech Republic	Mendel University in Brno	Forestry
Switzerland	University of Basel	Management
Sweden	Swedish University of Agricultural Sciences	Euroforester
Japan	Tokyo University of Agriculture	International Bio-Business

**Membership of NULES of Ukraine in international organizations:**

1. Food and Agriculture Organization of the United Nations (FAO), (<http://www.fao.org/>);
2. Global Consortium of Higher Education and Research for Agriculture (GCHERA), (<http://www.gchera.nauu.kiev.ua/>);
3. National commission of Ukraine for UNESCO “Human and biosphere”, (<http://www.nas.gov.ua/Activity/QuestionsProtectionNature/Pages/022.asp>);
4. European association EUROSCIENCE (<http://www.euroscience.org/>);
5. European Association of Veterinary Anatomists EAVA, (<http://www.eava.eu>);
6. Association for European Life Science Universities (ICA) ( <http://www.ica-europe.info/>);
7. European network of international relations officers (IROICA);
8. Federation of Veterinarians of Europe (FVE). (<http://www.fve.org/>);
9. World Association of Veterinary Anatomists WAVA, (<http://www.wava-amav.org/>);
10. International Council for Research and Development of Co-operation in Water Bioresources Research and Aquaculture;
11. International Union of Forest Research Organizations IUFRO, (<http://www.iufro.org/>);
12. International association “The Pesticide Stewardship Alliance”, (<http://tpsalliance.org/>);
13. International Fertilizer Society, (<http://www.fertiliser-society.org>);

MASTER DEGREE PROGRAMS

14. SAE International (The Engineering Society For Advancing Mobility Land Sea Air and Space), (<http://www.sae.org/about/>);
  15. International council for MBA in Agribusiness, Germany;
  16. International association "Friendship without borders";
  17. World Association for the History of Veterinary Medicine WAHVM;  
<http://www.wahvm.umn.edu/>
  18. International commission of The Red Book of Ukraine;
  19. Network of Aquaculture Centers in Central-Eastern Europe (NACEE)
  20. Visegrad University Association (VUA).
  21. IAEA, International Atomic Energy Agency (<http://www.iaea.org/>)
-

Edited by  
Full member of the National Academy of Science of Ukraine  
and the Ukrainian Academy of Agrarian Sciences, Dmytro O. Melnychuk

Authors: Natalia M. Ridei, Larysa V. Klikh, Oksana V. Zazymko, Svitlana P. Palamarchyk

Translated by N. Kharchuk, N. Yamnych, L. Dankevych

The authors would like to thank the deans and the deputy deans of the faculties of the basic institution of NULES of Ukraine (Kyiv) and SS of NULESU “Crimean Agro-technological University” for their feedback during the development of the material: S. Dodonov, I. Antipov, O. Bala, L. Bal-Prylypko, O. Hlazunova, O. Sykalo, O. Dorosh, T. Kaminska, S. Kovalevskyi, Y. Kolomiets, V. Kondratiuk, O. Marus, I. Ohrimenko, M. Prus, I. Radko, Y. Rybalko, I. Rogovskyi, M. Seba, R. Tarasenko, O. Yara, Y. Gerber, M. Melnikov, N. Kraynyuk, V. Safonova, V. Skripnik, T. Shatetc, E. Nazarova, O. Bachinsky, D. Kasatkin, O. Litvinenko

Design, typeset and printing by  
Publishing Center of NULESU  
03041, Kyiv, 15 Heroyiv Oborony st.

---