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MASTER CURRICULA AND TRAINING PROGRAMS

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FACULTY OF ECONOMICS

Dean – Professor, Doctor of Economics Anatolii Dibrova
Tel.: (044) 527-85-40
E-mail: economy_dean@nubip.edu.ua
Location: Building № 10, Room 301

Faculty organizes and coordinates educational process of master training in educational programs within specialties:

Specialty 051 "Economy"

Educational program "Economics of enterprise"

Guarantor of the educational and professional program – Professor, Doctor of Economics Oleksandr Yermakov

Educational program "Applied Economics"

Guarantor of the educational and professional program – Professor, Doctor of Economics Natalia Vdovenko

Graduating departments:

Economics
Tel.: (044) 527-81-01
(044) 527-82-69
E-mail: dibrova@nubip.edu.ua
Head of Department – Professor, Doctor of Economics Viktoriia Baidala

Organization of business and stock market activity
Tel.: (044) 527-86-60
E-mail: dibrova@nubip.edu.ua
Head of Department – Professor, Doctor of Economics Mykola Ilchuk

Global Economy
Tel. :(044) 527-86-48
E-mail: dibrova@nubip.edu.ua
Head of Department – Professor, Doctor of Economics Natalia Vdovenko

Specialty 071 "Accounting and Taxation"

Educational programs "Accounting and Audit"

Guarantor of the educational and professional program – PhD in Economics, Associate Professor, Tamara Hurenko

Graduating departments:

Accounting and Taxation
Tel. :(044) _527-83-61
E-mail: book-keep_chair@nubip.edu.ua
Head of Department – Professor, Doctor of Economics, Lyubov Gutsalenko

Statistics and economic analysis
Tel. :(044) 527-82-36
E-mail: statistics_chair@nubip.edu.ua
Head of Department – Professor, Doctor of Economics Inna D. Lazaryshina

Specialty 072 "Finance, Banking, Insurance and Stock Market"

Educational program "Finance and Credit"
Guarantor of the educational and professional program – Associate Professor, PhD in Economics Halyna Skrypnyk

Graduating departments:
Finance
Tel. :(044) 527 88 90
E-mail: kafedfin@ukr.net
Head of Department – Associate Professor, Doctor of Economics Olena Lemishko

Banking and Insurance
Tel. :(044) 527 88 90
E-mail: banking_chair@nubip.edu.ua
Head of Department (a.i.) – PhD in Economics, Associate Professor, Viktoria Kostyuk

Specialty 076 "Entrepreneurship and Trade"

Educational program "Entrepreneurship, Trade and Exchange Activities"
Guarantor of the educational and professional program – Associate Professor, Ph.D. in Economics Lyudmila Berezovska

Graduating department:
Organization of business and stock market activity
Tel.: (044) 527-86-60
E-mail: organizing_chair@nubip.edu.ua
Head of Department – Professor, Doctor of Economics Mykola Ilchuk

Training of masters of sciences in branch of knowledge "Social and Behavioral Sciences" in specialty 051 "ECONOMY" educational program "ECONOMICS OF ENTERPRISE"

Form of Training:	Licensed number of persons:
– Full-time	85
– Part-time	85
Duration of Training:	
– Full-time educational and professional program	1 year 4 months
– Part-time	1 year 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian, English
Qualification	Master of Economics graduates

The concept of training

The transition to the market economy, reforming property relations necessitated a radical restructuring of curricula, sending them to deepen the content and quality of professional education.

In addressing this important task is to promote the introduction of a higher speed training school.

Master stage of training in economics differ qualitatively new curricula and programs, innovative forms of educational process, which focused on providing a high level of theoretical knowledge, directly involved in the research and testing of their results in practice, mastery of scientific and methodological foundations of educational activities .

Master of Economics should be an expert with the general level of education and culture to the international standard that has sufficient intellectual capacity to a wide selection of specific areas of practice.

Educational and professional program of master's training

Increasing the efficiency of agricultural business is an important direction of economic growth of the national economy of Ukraine. This is hampered by the fact that agricultural production continues to be irrationally exploited by agrarians of natural resource, labor and production potential. The efficiency of resource utilization depends on a considerable number of various organizational, economic, technical and financial factors, which necessitates the need for a real justification of each investment project of a new or existing enterprise. Foreign and domestic experience convincingly shows that in a market environment of stable success cannot be achieved without doing business planning. It helps to allocate the priorities of management efforts, rationally allocate the necessary resources and optimize the economic performance of the enterprise. Economists of high skill must address these questions. The reform of the Ukrainian economy, its transition to market principles of operation require the development of new directions of economic science and practice. In these circumstances, the successful development of the agricultural sector is based on competent and competent study of market requirements, creation and organization of production of competitive products, which ensures high profitability. At the same time, the overall sectorial approach has important advantages over traditional projects and programs, as it increases the responsibility of the contractor in studying the problem at regional and national levels; more fully takes into account aspects of economic policy and state regulation. At the same time, it is necessary to cultivate in

the masters sufficient standards of public responsibility, which in the future will form adequate institutional and administrative capacity to formulate, implement and coordinate common sectorial programs. The concept and overall purpose of this program reflect the objective need to increase the economic efficiency and effectiveness of the country's agricultural sector. There is now a great need to train a highly intelligent, knowledgeable specialist in the field. Masters must learn how to take initiative and solve social and personal problems. Formerly a production-oriented system, it is now turning into a system aimed at generating income and raising the standard of living of the rural population.

Areas of employment of graduates

Managers and assistants economic departments of enterprises, associations, companies, etc. APC system. Head of village councils, specialists of district and regional directorates of agriculture administration. Agricultural enterprises of various forms. Enterprises serving the areas of the APC. Head of village councils, specialists of district and regional directorates of agriculture administration.

Practical training

Teaching and research farms NUBiP Ukraine; advanced enterprise, association, firm AIC system of Ukraine, etc.

Proposed Topics of Master's qualification Thesis

1. The development of agribusiness in the region and increase its efficiency.
2. Organization and prospects of agricultural enterprises.
3. Organization and economic efficiency of logistics farms.
4. Improvement of the forms of production maintenance of agricultural enterprises.
5. Socio-economic principles of sustainable rural development.
6. Improving forms of service production farms.
7. Formation and economic efficiency of sub grain products.
8. The formation and effective functioning of milk in the complex.
9. The economic mechanism of functioning of regional stock market agricultural products.
10. Features of formation and development of the stock market agricultural products in Ukraine.

Curriculum for Master in educational program "Economics of enterprise" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of specialty			
CC 1	Methodology and organization of scientific research	4	exam
CC 2	Agricultural policy	4	exam
Total		**8**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
CC 3	Managerial Economics	5	exam
CC 4	Project management	5	exam
CC 5	Global economy	5	exam
CC 6	Modeling in management of production systems	5	exam
CC 7	Business Planning entrepreneurship in agriculture	5	exam
CC 8	Corporate Social Responsibility	5	exam
CC 9	Competitiveness	5	exam
CC 10	Economics of production	5	exam
CC 11	Preparation and defense of master's qualification thesis	4	
CC 12	Internship	10	
Total		**54**	
Optional components of EPP			
Free choice according to specialty			
OC 1	Optional subject 1	5	exam
OC 2	Optional subject 2	5	exam
OC 3	Optional subject 3	5	exam
OC 4	Optional subject 4	5	exam
Total		**20**	
The total amount of compulsory components		**62**	
The total amount of optional components		**28**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of specialty

Methodology and organization of scientific research. Purpose of the course - mastering modern theoretical concepts of research, their practical application in their research and to familiarize students with the basics of intellectual property.

The object of study - methodology and research methods, methods of organization, and economic, organizational and financial principles of intellectual property in the domestic and international practice. Knowledge of the subject "Methodology and organization of scientific research with the basics of intellectual property" masters needed for research and writing of master works.

The main objective of the course is to prepare specialists in economics to conduct independent research.

Agricultural policy. Educational discipline enables master methodical and methodological foundations of development and implementation of measures to support and ensure the development of agriculture in the system of linkages in the national economy, and assess from the perspective of the theory of action-state structures for the regulation of the agricultural production in the country.

The main objectives of the discipline is to acquire basic knowledge on the economic substance, character and principal components of agricultural policy; analyze the effectiveness of the bodies and institutions of agricultural policy, through various market-policy instruments; understand the features of formation of agrarian policy in countries with different levels of socio-economic development, characterized agricultural policies of individual countries and blocs.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Managerial Economics course "Managerial Economics" is aimed at getting

students the knowledge and skills of decision making for strategic business development, business management in a competitive environment, risks and vicissitudes of the economic environment. Knowledge received as a result of the discipline will help to understand and interpret the economic reality and the mechanisms of modern economy, and facilitate the practical use of economic information and its skillful handling. The main issues of discipline are named: operational management of small and medium enterprises; corporate finance and their use; the competitiveness of enterprises; market analysis and market research; personnel management, cost, quality; Insurance and risk in business, logistics; project management; strategic management; Managerial Accounting; brand management; negotiation; PR; lobbying; economic regulation and competition policy; Labor Law; corporate social responsibility.

Project Management. The purpose of discipline is to develop in students the necessary theoretical knowledge and practical skills in project management methodology, which is a promising area of management theory and is becoming more common in all areas, and master the appropriate tools for successful project management of information of different types and species. The objective of discipline is learning major theoretical, methodological and organizational foundations of project management; familiarization with the features, principles and objectives of project management in the field of information; practical skills an information system project management among MS Project.

Global Economy. The purpose of discipline is the training of highly qualified specialists through formation of students' understanding of the conditions and factors of development, mechanisms and tools of the global economy, the realization of their intellectual mission for balanced decision-making in the context of civilizational progress. The main task - to learn and play at the professional level systematic knowledge of the global economy and to master professional skills formation strategies of economic development under the current transformation processes of globalization. Modeling in management of production system.

Business Planning entrepreneurship in agriculture. The purpose - formation of a system of knowledge on the methodology of development of business plans of enterprises and monitoring their performance. Objective: To study the theoretical principles of business planning of agricultural enterprises and practical skills to develop business plans and evaluating the effectiveness of business projects.

Corporate Social Responsibility. Formation of basic knowledge of theory and practice of social responsibility of professional competence, learning theoretical principles and practices of cooperation between the state, business, society and the rights of CSR.

The competitiveness of enterprises. The goal of discipline is to form student’s theoretical knowledge and practical skills for managing competitive businesses in the current economic conditions. The task - studying the theory of domestic and international experience and management competitiveness of enterprises.

Economics of production. Purpose of the topic - mastering the subject, methods and relationships discipline "Economics of production" in market conditions. Students should note that the subject of discipline is to identify specific forms of manifestation of economic laws of functioning and development of social production in the business sector in a market economy. Economics of production based on the general economic laws that are studied in the disciplines of macro - and microeconomics.

Optional components of EPP

Free choice according to specialty

Optional Block 1

Economics of development . The concept of system and development. Principles of systems formation. Mechanisms of system stability. Fundamental principles of

functioning and development of economic systems. Dynamics of economic processes. Feedback action. Harmonized influence of information emergent and synergetic factors on the development of economic systems.

Behavioral economics. Behavioral economics studies the specifics of the impact of emotional, cognitive and social factors on economic decision-making, as well as the impact of these decisions on the market. She strives to find the limits of rational choice and investigates behavioral models.

This course will change the way you think. You will learn how your random intuitive choices affect the process of making long-term economic decisions under conditions of uncertainty, how to recognize and use possible psychological biases to minimize risks and possible losses. This knowledge will help you build more realistic strategies in the field of the economy, as well as personal productivity, and will ensure the formation of professional competences in the field of economic decision-making and increasing the competitiveness of the enterprise on this basis.

Public Procurement. Studying system possibilities, implementing tender the process of electronic public and public procurement in Ukraine, the Prozorro information and telecommunication system, public procurements and features of accredited private trading platforms for Prozorro for public procurement, participation in international tenders in accordance with the WTO Agreement on Government Procurement (WTO GPA).

Optional Block 2

Risk assessment in agribusiness - Features of identification and manifestation of risks in agribusiness, characterization of their types, criteria for classification of agrarian risks, taking into account the specificity of agribusiness. Invariant methods of risk assessment and management in agriculture, the variety of types and instruments of risk coverage most commonly encountered in agribusiness.

Economic diagnostics and controlling. The discipline is aimed at forming students' knowledge and practical skills in conducting economic diagnostics of the enterprise in order to identify problems and introduce controlling mechanisms to solve them. Among the studied topics, it is possible to highlight the analysis of the financial state of the enterprise, the evaluation of the efficiency of the enterprise, the implementation of risk monitoring, and others. During the course, students will get acquainted with various methods and tools used in economic diagnostics and controlling. They will also gain practical skills in applying these methods and tools to real-life situations faced by businesses. The course will cover topics such as financial statement analysis, ratio analysis, break-even analysis, cost, volume and profit analysis, budgeting, and variance analysis. In addition, students will learn about risk management, internal control and audit procedures. Overall, the Economic Diagnostics and Controlling discipline is a valuable course for anyone interested in a career in business or accounting. The skills and knowledge gained in this course are applicable to a wide range of industries and can help students be competitive in the job market.

Innovative development of agricultural enterprises. Purpose: formation of a complete system of theoretical knowledge and practical skills to ensure the innovative development of agricultural enterprises, assessment of their innovative potential, justification and implementation of effective management decisions on the development of the economy based on innovation. Task: study of management mechanisms of innovative development of agrarian enterprises; study of the process of ensuring the effectiveness of the formation and use of innovative potential of enterprises; analysis of the effectiveness of investment in innovation; acquisition of skills to substantiate directions of priority innovative development of agrarian enterprises. The subject of the discipline: regularities, principles, methods and processes of ensuring the innovative development of agricultural enterprises.

Optional Block 3

Economics and Human Resources Management. The situation of the labour market is analyzed, issues of labour potential development, effective formation of the internal market of labour, selection and adaptation of staff, effective HR management, social protection, incite to professional development and resolution of labour conflicts.

Social and solidarity economy. The purpose of the study of the discipline "Social Economy" consists in the formation of fundamental knowledge on the theory and practice of social entrepreneurship, its fundamental differences from traditional types of business and the competitive advantages of the enterprises of interest. Familiarity with different types of social enterprises, their organizational forms and business models. The main objective of the course "Social Entrepreneurship" is to get the participants a set of knowledge and skills necessary for the effective launch of their own social business or participation in social projects.

Optional Block 4

Rural Economic Governance. Examines basic approaches, models, regulatory and administrative and instrumental support for territorial community creation processes, activities of local governments and executive authorities, capable of ensuring the accessibility and quality of services provided by such bodies, as well as the necessary this resource base, the creation of adequate material, financial and organizational conditions to ensure the implementation of local self-government bodies and delegated s authority division of powers in the system of local self-government bodies and executive bodies at different levels of the administrative-territorial structure according to the principle of subsidiarity. Investigates opportunities, risks and threats to rural areas under decentralization and new approaches to regional development in the country, policies for spatial development of rural areas based on a territorially-oriented approach, taking into account EU and OECD standards, effective governance to ensure long- and medium-term planning for territorial and community development, decentralization of power, development of an effective system of local self-government, approval of basic social standards, development of a network of organizations, mechanisms and tools that contribute to the effective functioning of private and state structures in rural areas.

Socio-economic development of territorial communities. As a result of the decentralization of power and the reform of local self-government in Ukraine, approaches to managing the development of the social sphere and the economy of territorial communities have changed. The developed topic of the discipline for students is aimed at providing them with a competent approach to determining the priority areas of effective use of available resources in the socio-economic sphere of territorial communities. The aim of the discipline is the formation of students' knowledge about the features of administrative, social, and economic components of the development of territorial communities. This will allow the future specialist to take into account the economic potential of territorial communities when justifying conceptual directions and practical measures of its implementation for the development of economic entities, social and industrial infrastructure, raising the standard of living of the population, etc.

Stock market. Discipline studies the organization and functioning of the stock market system as the main driving units and a market economy. The purpose of the study course - to give future specialists agrarian theoretical basis and practical skills of exchange activities and effective use of exchange operations in its future activities.

Training of masters of sciences in branch of knowledge "Social and behavioral sciences" in specialty 051 "ECONOMY" educational program "APPLIED ECONOMICS"

Form of training:	Licensed persons:
- part-time	85
Training period:	
- part-time	1 year 4 months
ECTS credits:	
- educational-professional program	90
Teaching language	Ukrainian, English
Qualification of graduates	Master of Economics

The concept of training

The transition to a market economy, the reform of property relations caused the need for a radical restructuring of curricula, sending them to deepen the content and improve the quality of vocational education.

The solution of this important task should be facilitated by the introduction of advanced training in the system of higher education.

The master's stage of training of specialists in economics distinguishes qualitatively new curricula and programs, innovative forms of organization of the educational process, which are oriented on ensuring a high level of theoretical training, direct participation in conducting scientific research and approbation of their results in practical work, mastering scientific and methodological foundations of pedagogical activity .

The Master of Science in Economics must be a specialist in the general level of education and culture at the level of the World Standards, which has sufficient intellectual potential for a wide range of specific areas of practical activity.

Educational and professional program of master's training

The purpose of the educational and professional program is to form the ability of a future specialist to dynamically combine knowledge, skills, communication skills and capabilities with practical activities and responsibilities when solving problems and problems in the field of increasing the competitiveness of agrarian business, modeling the future development of the agrarian sector on the basis of relevant agro-political scenarios solutions of the model "AGMEMOD".

Areas of employment of graduates

The employment of graduates of the Regional Economy program is the following:

- directors of departments and heads of departments of central executive bodies;
- heads of united territorial communities;
- Top-managers of leading companies.

Practical training

The program provides for the obligatory condition of passing of educational and industrial practice in central executive authorities, agricultural enterprises.

Proposed Topics of Master's qualification Thesis

1. Development of agrarian business in the region and increase its efficiency.
2. Organization and prospects of development of agricultural enterprises.

3. Organization and economic efficiency of material and technical support of agricultural enterprises.

4. Improvement of forms of production service of agricultural enterprises.

5. Socio-economic bases of sustainable development of rural territories.

6. Improvement of forms of production service of agricultural enterprises.

7. Formation and economic efficiency of grain product subcomplex functioning.

8. Formation and efficiency of functioning of dairy products under the complex.

9. Economic mechanism of functioning of the exchange regional market of agricultural products.

10. Features of the formation and development of the exchange market of agricultural products in Ukraine.

Curriculum of Master training in educational program "Applied Economics" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of specialty			
CC 1	Methodology and organization of scientific research	4	exam
CC 2	Agricultural policy	4	exam
Total		**8**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 3	Managerial Economics	5	exam
CC 4	Project management	5	exam
CC 5	Global economy	5	exam
CC 6	Modeling in management of production systems	5	exam
CC 7	Business management	5	exam
CC 8	Economics of production	5	exam
CC 9	Enterprise planning and organization	5	exam
CC 10	Applied Software Solutions in Economics (Agmemod)	5	exam
CC 11	Preparation and defense of master's qualification thesis	4	
CC 12	Internship	10	
Total		**54**	
Optional components of EPP			
Free choice according to specialty			
OC 1	Optional subject 1	5	exam
OC 2	Optional subject 2	5	exam
OC 3	Optional subject 3	5	exam
OC 4	Optional subject 4	5	exam
Total		**20**	
The total amount of compulsory components		**62**	
The total amount of optional components		**28**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of specialty

Methodology and organization of scientific research. Purpose of the course - mastering modern theoretical concepts of research, their practical application in their research and to familiarize students with the basics of intellectual property.

The object of study - methodology and research methods, methods of organization, and economic, organizational and financial principles of intellectual property in the domestic and international practice. Knowledge of the subject "Methodology and organization of scientific research with the basics of intellectual property" masters needed for research and writing of master works.

The main objective of the course is to prepare specialists in economics to conduct independent research.

Agricultural policy. Educational discipline enables master methodical and methodological foundations of development and implementation of measures to support and ensure the development of agriculture in the system of linkages in the national economy, and assess from the perspective of the theory of action-state structures for the regulation of the agricultural production in the country.

The main objectives of the discipline is to acquire basic knowledge on the economic substance, character and principal components of agricultural policy; analyze the effectiveness of the bodies and institutions of agricultural policy, through various market-policy instruments; understand the features of formation of agrarian policy in countries with different levels of socio-economic development, characterized agricultural policies of individual countries and blocs.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Managerial Economics course "Managerial Economics" is aimed at getting students the knowledge and skills of decision making for strategic business development, business management in a competitive environment, risks and vicissitudes of the economic environment. Knowledge received as a result of the discipline will help to understand and interpret the economic reality and the mechanisms of modern economy, and facilitate the practical use of economic information and its skillful handling. The main issues of discipline are named: operational management of small and medium enterprises; corporate finance and their use; the competitiveness of enterprises; market analysis and market research; personnel management, cost, quality; Insurance and risk in business, logistics; project management; strategic management; Managerial Accounting; brand management; negotiation; PR; lobbying; economic regulation and competition policy; Labor Law; corporate social responsibility.

Project Management. The purpose of discipline is to develop in students the necessary theoretical knowledge and practical skills in project management methodology, which is a promising area of management theory and is becoming more common in all areas, and master the appropriate tools for successful project management of information of different types and species. The objective of discipline is learning major theoretical, methodological and organizational foundations of project management; familiarization with the features, principles and objectives of project management in the field of information; practical skills an information system project management among MS Project.

Global Economy. The purpose of discipline is the training of highly qualified specialists through formation of students' understanding of the conditions and factors of development, mechanisms and tools of the global economy, the realization of their

intellectual mission for balanced decision-making in the context of civilizational progress. The main task - to learn and play at the professional level systematic knowledge of the global economy and to master professional skills formation strategies of economic development under the current transformation processes of globalization. Modeling in management of production system.

Business Management. Studying the spectrum of methods, methods and means of business management, more promising ways to achieve the tasks, automation of business using specially designed software.

Economics of production. Purpose of the topic - mastering the subject, methods and relationships discipline "Economics of production" in market conditions. Students should note that the subject of discipline is to identify specific forms of manifestation of economic laws of functioning and development of social production in the business sector in a market economy. Economics of production based on the general economic laws that are studied in the disciplines of macro - and microeconomics.

Enterprise planning and organization - studies theoretical and practical aspects of agricultural business organization, approaches to rationalization and design of rural business structures, assists in mastering practical skills to justify design decisions, the ability to use research and organizational skills in the process of developing organizational projects for business plan writing for use in the field.

Applied Software Solutions in Economics. Studying the models of economic systems in a form that makes it possible to check these models for the adequacy of the means of mathematical statistics, carry out an empirical examination of the provisions of economic theory, confirming or rejecting the latter, is solely in the application of mathematics, and the theoretical provisions of which do not necessarily require empirical confirmation, the possibility of modeling the future development of the agrarian sector on the basis of the scenarios of agro-political decisions of the AGMEMOD model.

Optional components of EPP

Free choice according to specialty

Optional Block 1

Marketing and management chain value creation. Studying the chains of added value in the branches of economy, markets, defining the supply and demand for the products or services offered, assessing their competitiveness, developing production plans, supplying raw materials and components necessary for the production of products or services. The process of production of products and services, ending with sales in the market of sale, after-sales service taking into account the interests of all participants, is considered.

Territorial planning and development. Studying the structuring of the territorial and economic space and its constituent territorial entities, the territorial organization of the economy, the management of territorial development, territorial aspects of the socio-ecological and economic system of the country, the functioning of the territorial subsystems of the national economy, their individual elements and interaction between them, as well as the mechanisms of management of socio- economic development of the regions.

Public relations and media design. Studying the essence of the system of organization links with the target audience and its elements, patterns and randomness of their occurrence, functioning and development, principles and methods of activity in the formation and management of public opinion in the interests of the organization and the public.

Public Procurement. Studying system possibilities, implementing tender the process of electronic public and public procurement in Ukraine, the Prozorro information

and telecommunication system, public procurements and features of accredited private trading platforms for Prozorro for public procurement, participation in international tenders in accordance with the WTO Agreement on Government Procurement (WTO GPA).

Optional Block 2

Regional economic programs and development assistance programs. Studying mechanisms and tools for promoting the development of territories, special forms of assistance to the economic development of territories, including them in targeted state programs, creating special regimes for them in the special economic zone; creation of territorial development agencies and private-public partnerships; conditions for effective use of special forms of assistance for the economic development of territories for certain problems and territories.

Regional development concepts. Studying the measures, principles, methods of state regional policy, sectorial and sectorial programs of development of regions in terms of aligning them with the strategic objectives of the state regional policy, assessing the impact of the implementation of such programs on regional development.

Human Resource Management. Studying the structure of the human resources management strategy, the relationship between the strategy of development and human resources management strategy, the methodology for conducting strategic analysis of the human resources of the organization, leadership capabilities, teams and organizations, human resources management strategies at different stages of development, indicators for assessing the effectiveness of strategic human resources management, and ways to increase it.

Management of services in rural areas. Studying the effective management of rural areas, social infrastructure of rural areas, regional and local strategies, non-agricultural economic development programs based on available resource potential and existing needs for products and services of specific rural areas, alternative types of economic activity in rural areas, in particular by raising the level of development of peoples' spheres of life, activity and life, distribution of expenditures for financing between local authorities and agricultural holdings on the basis of public-private partnership.

Optional Block 3

Management of united territorial communities. Studying the basic approaches, models, normative-legal and managerial-instrumental support of processes of creation of territorial communities, activity of local self-government bodies and executive authorities that are able to ensure the availability and proper quality of services provided by such bodies, as well as the necessary resource base for it, creation appropriate financial, financial and organizational conditions for ensuring the implementation of local and self-government bodies by their own and delegated authorities, the division of powers in the subject local authorities and executive bodies at various levels of administrative and territorial system on the principle of subsidiarity.

Applied econometrics. Mastering mathematical and statistical tools of econometrics, which consists of sections: classical linear model of multiple regression and classical method of least squares; a generalized linear multiple regression model and a generalized least squares method; models and methods of statistical analysis; time series and forecasting; system of structural equations.

Applied Economics. The purpose is to study socio-economic, organizationally managerial, analytical, research and teaching activities in the field of applied problems in the field of economic management in the conditions of constant change. He is able to develop and implement management decisions in the field of industrial and agrarian business, domestic and foreign markets, labor market, financial market, in the field of

environmental economics using economically mathematical methods of analysis, forecasting and modeling.

Optional Block 4

Strategies and instruments of European regional policy. Studying the theoretical approaches and practical measures of implementing the EU regional policy, tasks and mechanisms of implementation of EU strategies and instruments, European structural and investment funds, application of instruments by international organizations, European experience of implementing regional policy, reforming agrarian policy taking into account the experience of international organizations in accordance with the principles of a market economy and structural policy within the framework of the Association Agreement between the European Union and Ukraine.

Social responsibility in the region. Studying the formation of fundamental knowledge of the theory and practice of social responsibility from the point of view of modern standards of social policy, social reporting, business ethics and human rights in the integration of the concept of sustainable development and the acquisition of appropriate professional competences that ensure the formation of socially responsible behavior.

Public-private partnership. Studying methodical tools for development of public-private partnership in the region in the conditions of deceleration of the rates of globalization of economy, forms of interaction of state authorities and business structures in the implementation of public-private partnership, mechanism of realization of public-private partnership, models of the system of economic management of the region using public-private partnership, international experience of public private partnership, mechanisms of state support of public-private partnership in foreign countries, world conscious of interaction between public and private sectors.

Municipal financial management. Studying the general principles, methods and models of communal financial management, mechanisms and system of municipal financial management, forms and methods of administration of administrative territory and general provisions, principles of organization of the system of state power and local self-government in the administrative territory, management of socio-economic processes of the region in a market economy.

Training of masters of sciences
field of knowledge "Management and Administration"
in specialty 071 "ACCOUNTING AND TAXATION"
in educational program "ACCOUNTING AND AUDIT"

Form of Training:	licensed number of persons:
– Full -time	180
– Part-time	180
Duration of Training:	
– Full-time educational and professional program	1 year 4 months
– Part-time	1 year 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian, English
Qualification	Master's degree in accounting and taxation

The concept of training

Modern development of market relations requires from experts in accounting and taxation validity of professional knowledge to the world standards, creative thinking, intellectual potential for a wide selection of specific areas of practical work. This need to improve current systems of training in accounting and taxation is urgent need for restructuring curricula, targeting them for deepening the content and improve the quality of professional education, research teaching methods of major disciplines in training.

Master stage of training in accounting and taxation distinguish qualitatively new curricula and programs, innovative forms of educational process, which focused on providing a high level of theoretical knowledge, directly involved in the research and testing of their results in practice, mastery of scientific and methodological foundations of educational activities.

Master of accounting and taxation must be an expert with the general level of education and culture to the world 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 system elements, define their essential parameters and characteristics, form a model system, make it rational management influence, make proposals for improving the activity of enterprises.

The defining features of the master should 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 and control solutions results.

Master of accounting and taxation must possess not only new methods of work, but also new ideas about the management system in which they must apply.

Masters in the educational program "Accounting and Audit" aimed at training high-level professionals who can effectively analyze production and financial activities of business entities of different ownership, assess the internal potential of the company from a position of increasing the efficiency of its production and sales activities, and compliance capabilities and threats to the environment, to explore domestic and foreign markets, to determine an estimate of his situation, ensuring rational strategic development of the company.

Educational and professional program of master's training

Provides research trends and patterns of development of accounting in Ukraine in

terms of its principles for reforming the international standards and requirements of the institutions of the European integration; methods and accounting organization of objects: non-current and current assets, equity, long-term and current biological assets, long-term and current liabilities, payments to the tax system, expenses and income for the activities; Financial Statements; managerial cost accounting and calculation of cost of production in crop, livestock, auxiliary industries; control, audit and analysis of real assets, liabilities and activities of processes using computer technology.

Provides research information and analytical system of socio-economic development of the financial sector and the financial corporations sector not as an indicator of adaptive ability of the enterprise to current economic conditions. The possibility to develop and implement a flexible development strategy of economic activities through the effective use of information in terms of post-industrial development becomes functional role of productive resources. The possibility of improving the accounting information using the possibilities of the theory of knowledge, based on analytical control functions.

Areas of employment of graduates

Chief accountant, deputy chief accountant, senior accountant, the first category accountant, the second category accountant, accountant (with specialist degree) in agricultural business? researcher (information analyst), accounting analyst, analyst of consolidated information, analyst of lending.

Practical training

Practical training is carried out on the basis of the following companies: NUBiP of Ukraine "Velykosnitynske educational and experimental farm named after O.V. MUZYCHENKO"; NUBiP of Ukraine "Agronomic Research Station"; NUBiP of Ukraine "Teaching and Research Farm "Vorzel"; NUBiP of Ukraine “Boyarka Forestry Experimental Station"; NUBiP of Ukraine Nemishaevo Agricultural College; Ltd Agroindustrial company "Mriya"; company «Mazars Ukraine»; Consulting company EBS;other bases of practical training of university students from among leading institutions, enterprises, organizations of any ownership in Ukraine and abroad, with appropriate conditions for the practice of students in accordance with the requirements of education and professional training programs.

Proposed Topics of Master's qualification Thesis

1. Accounting and analytical support in the management of fixed assets.
2. Accounting and analytical support in the management of current biological assets.
3. Accounting and analytical support in the management costs of agricultural enterprises.
4. Accounting, control and analysis of production costs of crop production.
5. Accounting and internal business control production of finished products.
6. Balance sheet of the bank, its preparation method 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 formation and use of income.
10. Accounting and internal business control efficiency of bank loans.

Curriculum of Master training
in educational program "Accounting and Audit"
(educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Methodology and organization of scientific research	5	exam
CC 2	Agrarian policy	5	exam
Total		**10**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 3	Tax management	5	exam
CC 4	Accounting in the management of agribusiness enterprises	6	exam
CC 5	Accounting support of enterprise management in the ERP system	5	exam
CC 6	Accounting and financial reporting according international standards	5	exam
CC 7	Audit organization and methodology	5	exam
CC 8	Organization of accounting	5	exam
CC 9	Strategic analysis in the management of agribusiness enterprises	5	exam
CC 10	State financial control	5	exam
CC 11	Educational practice (special training)	2	
CC 12	Internship	8	
CC 13	Preparation and defense of master's qualification thesis	6	
Total		**56**	
Optional components of EPP			
Optional Block *by specialty*			
OC 1	Optional subject 1	4	exam
OC 2	Optional subject 2	4	exam
OC 3	Optional subject 3	4	exam
OC 4	Optional subject 4	4	exam
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Methodology and organization of scientific research. The goal of the discipline: formation of a system of knowledge on methodology, theory of the method and the research process, methodological support of scientific research activities at the stages of writing a master's thesis, formation of the ability to organize scientific research on a certain problem using the entire complex of traditional methods of scientific research, including general and special methods. The main task of the theoretical part of the course is to acquaint students with modern concepts of scientific creativity, with the basics of the methodology of scientific knowledge and the methodology of scientific research. The main

tasks of the practical part are the development of abilities for self-education, mastering the skills of forming and using a conscious methodological position of scientific research. As a result of mastering the course, students should improve their skills in searching, selecting and processing scientific information, in accurately formulating the problem, goal, tasks, object, subject, research methods.

Agrarian policy. The discipline introduces the principles of formation of policy in agrarian sphere, gives the possibility to gain proficiency in methodical and methodological principles of the development and realization of the complex of actions concerning support and provision of the development of agriculture in the system of inter-branch links in national economy as well as estimate from the theoretic position practical actions of state structures concerning regulation of the agricultural production of the country. Both national and foreign experience is studied. In case of mastering the material students get the possibility to form their own view on professional base about processes and phenomena happening in agrarian sector of the state economy.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

Tax management. Theoretical and organizational principles of fiscal management. The accounting work in the bodies of DPS. Control and verification work of the DPS.

Accounting in the management of agribusiness enterprises. A practical course that contains basic information about the theory, methodology and practice of accounting information formation for modern and potential management needs of agribusiness enterprises; theoretical, methodological and practical principles of using accounting as an information source in enterprise management; the procedure for the formation of accounting reports for enterprise management.

The goal of the discipline is the formation of a complete system of knowledge regarding the ability to form and use accounting information for making informed management decisions at all levels of management of agribusiness enterprises; organize the accounting process and regulate the activities of its executors in accordance with the requirements of the company's management; to conduct scientific research with the use of modern econometric tools in order to solve the actual tasks of accounting and analysis of the economic entity; design an order on accounting policy, internal reporting forms to provide management with the necessary information for the purpose of making management decisions; apply methodical methods of analytical support of modern management systems taking into account the company's development strategy; form financial statements according to national and international standards, interpret and use relevant information to make management decisions.

Accounting support of enterprise management in the ERP system. A practical course in which applicants will gain skills in working with modern software for complex enterprise management: make initial settings of the program, fill out directories, correctly create customer orders; reserve goods in the warehouse for customer orders; arrange the shipment of goods, manage the procurement business process; process cash flows; analyze the main financial indicators of business activity, etc. The course involves the implementation of all tasks in applied software solutions.

Accounting and financial reporting according to international standards. The purpose of the discipline is for students to acquire the necessary theoretical knowledge of the regulatory provisions and content of the main International Financial Reporting Standards (IFRS) and their interpretations, as well as to master practical skills in applying procedures related to the preparation and submission of financial reports by transnational corporations and securities market participants. The task of the discipline: providing students with an understanding of the main provisions of the International Financial

Reporting Standards regarding the composition of financial statements, approaches to recognition and disclosure of financial statement items, the selection and establishment of accounting policies and accounting estimates, as well as regarding the methodology of forming both individual financial statements and consolidated financial statements non-state owned companies.

Audit organization and methodology. The goal of the educational discipline is the formation of students' basic theoretical knowledge and practical skills in the organization and methodology of auditing, the organization of the work of an audit firm and the work of auditors. Tasks of the discipline: study of the theoretical foundations of the functioning of the audit as an independent financial control in Ukraine; regulatory and legal acts regulating audit activity, acquisition of practical skills in organization, planning and execution of audit procedures. In the process of studying the course, the following tasks are expected to be solved: acquisition of practical skills in the organization of the audit of entrepreneurial activity; planning of the audit process; implementation of a set of audit procedures; execution of working documents of the auditor; formation of independent auditors' reports and other final documents.

Organization of accounting. Studying the principles and process of organizing accounting and setting up accounting, control, and analytical processes is focused on providing information for management decision-making.

Studying this discipline will help to: organize, develop, model accounting systems, and coordinate the activities of accounting staff, taking into account the needs of business management; possess innovative technologies, justify the choice and explain the new methods of preparing and providing accounting information for the needs of business management; determine the information needs of users of accounting information in enterprise management, provide consultations to the management staff of the business entity regarding accounting information; justify the choice of the optimal taxation system for the activities of the business entity based on the current tax legislation; justify the choice and procedure for applying managerial information technologies for accounting, analysis, audit, and taxation in the system of making management decisions in order to optimize them.

Strategic analysis in the management of agribusiness enterprises. Strategic analysis in company management and strategy designing. The essence, directions, and role of strategic analysis at the enterprise. Types of strategies and methods of strategic analysis. Strategic analysis of the company's competitive positions on the market and prospects of its development. Benchmarking. Analysis of business performance.

State financial control. The goal of the discipline "State financial control" is to form knowledge in the subjects of the second (master's) level of higher education on the issues of a clearly organized system of control over the production, distribution and redistribution of the public product and other spheres of public life in the state. The effectiveness of the work of the bodies of executive power and local self-government in the state largely depends on the implementation of control over the implementation of laws, decisions, orders, and on their proper organization.

Main tasks: studying the main types, forms and methods of state financial control; disclosure of principles of organization and methods of conducting state financial control; characteristics of state financial control bodies, their rights, tasks and duties; studying the specifics of conducting internal financial control in the bodies of the central executive power and in the objects under their control; acquiring knowledge on identifying deviations from accepted norms and standards, violations of the principles of legality with the ability to take corrective measures; the ability to control financial and economic activities, as well as ensure legality, financial discipline and the effectiveness of the formation and spending of funds, including budgetary and other assets in the process of ownership, disposal, use

and alienation of state property, compensation for losses and establishing the degree of responsibility in the event violation of financial, including budgetary, legislation at the controlled object.

Optional components of EPP

Free choice according to specialty

E-document circulation and reporting. The purpose of studying the course "E-document circulation and reporting" is to acquire theoretical knowledge and practical skills in the organization of electronic document management, mastering the basic methods of creating, storing and working with electronic documents and with specialized document management systems, principles of construction and functioning of electronic document circulation systems, mechanism of qualified electronic signature, formation of skills with creation of an information model of the organization as a basis for implementation technologies of electronic document circulation.

Accounting Forensic examination. The main provisions of forensic economic examination, research methods, forensic economic examination conclusion, methodology for researching transactions: with cash, material assets, labor remuneration, settlements with debtors and creditors, and tax settlements.

Public Procurement. The discipline ensures the formation of students' knowledge and skills on matters of organization and participation in public procurement.

The task of the discipline is to reveal the following issues: principles of public procurement; methodical and methodological foundations of the organization of procurement activities in the ProZorro electronic procurement system; appointment procedure, main functions and responsibilities of the authorized person for public procurement; procurement planning, determination of the subject of procurement of goods, works, and services; requirements for the formation of tender documentation; types of purchases; peculiarities and specifics of procurement of individual procurement items; appeals in the field of public procurement; control over compliance with legislation in the field of state (public) procurement; responsibility for violations of legislation in the field of procurement; peculiarities of procurement in the conditions of martial law.

Professional ethics and independence of accountants and auditors. The goal of the discipline is the formation of a consistent system of knowledge from theoretical authority and the acquisition of practical skills regarding the use of international and domestic norms and principles of behavior and morals of professional accountants, auditors and tax accountants, recognition of responsibility to the owner, team of the enterprise and the public.

Main tasks: study of the conceptual foundations of the ethics of a professional accountant, auditor and tax official, the rules of their application in accordance with the International Code of Ethics of Professional Accountants; familiarization with areas of professional development of accountants, auditors, their acquisition of digital literacy skills, with the aim of their professional growth; disclosure of the essence of the profession of accountant (auditor, taxman) and explanation of the significance of these professions in society; clarification and argumentation of the main requirements for modern professional accountants (digital accountant) and auditors; formation of ideas about work organization and social responsibility of modern professional accountants and auditors.

Global Economy. The purpose of discipline is the training of highly qualified specialists through formation of students' understanding of the conditions and factors of development, mechanisms and tools of the global economy, the realization of their intellectual mission for balanced decision-making in the context of civilizational progress. The main task - to learn and play at the professional level systematic knowledge of the

global economy and to master professional skills formation strategies of economic development under the current transformation processes of globalization.

Analytical substantiation of managerial decisions. Technology and models of the process of development of management solutions. Analytical methods of justifying management decisions. Analytical justification of profit, income and expense management. Analytical justification of management of current assets. Analytical justification of cash flow management. Analytical justification of capital management. Analytical justification of management of investment activities. Analytical justification of financial risk management. Analytical justification of enterprise competitiveness management. Analytical justification of enterprise cost management. Analytical justification of anti-crisis management of the enterprise.

Business and social analysis. Studying the theoretical foundations of business and social analysis; formation of practical skills for assessing the level and quality of life, economic activity, availability and quality of social services, education, etc.; forecasting the development of socially responsible business, taking into account the socio-ecological requests of management, society and the state. In addition to the population, the object of attention of socio-economic research is the activity of enterprises, regional development, social activity of state and public organizations, social responsibility of business.

Strategic Management Accounting. Evolution of strategic management accounting. Strategic management accounting as a system of information support for competitive strategies. A balanced system of indicators. Strategic cost management. Calculation systems by types of activity. Toolkit of strategic management accounting in productivity improvement and quality management.

Applied Econometrics. Strategic decisions in modern economic conditions with a high level of uncertainty are based on formalized assessment methods, including econometric ones. The probabilistic nature of the development of socio-economic and environmental phenomena and processes justifies the need for the formation of special knowledge in students regarding stochastic analysis of their development, forecasting of functioning trends and generalization of scientifically based recommendations for making management decisions. The purpose of studying the "Applied Econometrics" course is the formation of future accountants in modern economic thinking and special knowledge in the use of system and process analysis, various methods of economic and mathematical analysis as a component of decision-making support for economic objects of various complexity, hierarchy and organization. The logic and structure of the "Applied Econometrics" course will allow students to acquire the necessary amount of knowledge, which makes it possible to achieve a high level of professional and economic competence of future specialists.

Training of masters of sciences in branch of knowledge "Management and administration" in specialty 072 "FINANCE, BANKING, INSURANCE AND STOCK MARKET" educational program "FINANCE AND CREDIT"

Form of Training:	Licensed number of persons:
– Full-time	100
– Part-time	100
Duration of Training:	
– Full-time educational and professional program	1 year 4 months
– Part-time	1 year 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian, English
Qualification	Master of Finance, Banking, Insurance and Stock Market

The concept of training

Training focused on in-depth study of theory and practice to ensure effective financial management of enterprises of agrarian sphere of economy, support of training experts from banking, insurance sectors for the needs of agricultural enterprises. An important direction of the program is targeting students for independent work, the development of creative activity of finding effective solutions to the problems studied, acquiring skills to the study of scientific literature, existing legislation and on this basis to acquire the ability to form internal and external financial relations, efficient use of financial management, successfully applied methodological tools of financial management.

Specialist "Finance, banking and insurance" is to obtain a high level of basic knowledge in financial management, understand the features of software and information to be able to use computer technology in the financial and economic activities of agricultural entities, to know and understand the basic principles of agrarian policy.

Theoretical knowledge of financial discipline should undergo testing directly on specific enterprises and financial institutions.

Practical training has been made to equip future masters in finance and credit practical knowledge in finance, professional skills and ability to work as heads of financial departments of companies, financial analysts, chief financial officers.

Serious attention along with professional study of financial work should be given to the study of effective methods of organization and financial management of enterprises.

Implementation of research, their implementation in practice, implementation skills to think creatively and take extraordinary decisions are urgent problem of preparing future scientific staff in finance and credit.

The purpose of the master's work is to systematize, deepening and consolidation of theoretical knowledge, their testing in production.

Formation of a new type of modern economic thinking should be directed to development initiatives, increased business activity, finding creative ways that lead to improving the lives of people in a market economy.

Effective teaching educational program "Finance and credit" is provided:

- Involvement of teaching staff qualifications;
- The use in teaching of modern educational technologies that provide theoretical knowledge and practical skills required for the provision of financial services;

- The use of flexible learning, individual approach to students, the possibility of combining teaching with research work in writing the Master's thesis under the guidance of the most experienced teacher's qualifications;

- Holding consultation sessions, workshops financial services businesses of the agricultural sector, participation of students in scientific conferences on topical issues of the financial activities of agricultural enterprises.

Education provides training that can independently make effective decisions regarding the provision of financial services to entrepreneurs and generates qualified for Finance.

Educational and professional program of master's training

In the conditions of the market economy of Ukraine, efficient use of financial resources has become of paramount importance. A rational solution to the problems of economic entities depends, first and foremost, on sound financial decisions. For financial professionals it is very important to have a methodological tool of financial management: cash flow management, method of systematic analysis of financial statements, management of profit, capital and investments, organization of internal company forecasting and planning. The purpose of OPP is to train specialists who are able to solve the main problems of financial management at the state level, which include: improvement and development of methods of public finance management, making qualified and scientifically sound financial management decisions in the field of public finance and taxation; implementation and organization of financial planning system in a financial institution; monitoring of industries and spheres of activity of enterprises, state institutions and organizations; predictive and analytical activities based on the use of modern information technologies; ensuring information and financial security of the state. There is also the formation of key competencies for students to perform the basic functions of tax management at the corporate level.

Training of specialists for the banking sector. The educational program envisages the acquisition of knowledge by students in the management of commercial bank activities taking into account the factors of the internal and external environment, as well as the organization of work of the central bank and the main directions of monetary policy. In addition, the training program provides for the study of banking services to entrepreneurs in the agricultural sector, due to the seasonality and duration of agricultural production and requires the development of specialized risk assessment tools, students gain basic knowledge of the theory and practical skills of risk management and insurance of risk management methods.

Areas of employment of graduates

Managers and assistants' economic financial departments of agricultural enterprises, associations, managers of banks. Leaders, assistants, managers, insurance companies, heads of financial departments of enterprises of the agricultural sector. Heads and specialists of economic, financial departments of companies, associations, managers, financial institutions, firms serving areas APK different State and local governments, public sector institutions; public non-profit organizations, charitable foundations; consulting, analytical, scientific and educational institutions; commercial organizations that cooperate with state authorities.

Practical training

Teaching and research farms NUBiP Ukraine; advanced enterprise, association, firm system of Ukraine agribusiness, financial institutions and others.

Proposed Topics of Master's qualification Thesis

1. Loans to agricultural enterprises banks.
2. Settlement services for agricultural enterprises banks.
3. Cash flow management in the enterprise.
4. Management of financial stability of the company.
5. Insurance risk management system in the enterprise.
6. Insurance crop.
7. Mutual funds and their functioning in the international financial exchange market.
8. Features and prospects of on-line trading in global financial markets.
9. Development of long-term bank lending to agricultural enterprises.
10. Financial aspects of expert monetary assessment of agricultural land.

Curriculum of Master training in educational program "Finance and Credit" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Methodology and organization of scientific research	4	exam
CC 2	Agricultural policy	4	exam
Total		**8**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 3	Financial management	5	exam
CC 4	Budget management	5	exam
CC 5	Project financing	5	exam
CC 6	Financial services market	5	exam
CC 7	Management of financial readjustment Company	5	exam
CC 8	Banking management	5	exam
CC 8	Insurance management	5	exam
CC 10	Tax management	5	exam
CC 11	Preparation and defense of master's qualification thesis	4	
CC 12	Internship	10	
Total		**54**	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1			
OC 1.1	Agrarian risks and their insurance	5	exam
OC 1.2	Monetary policy and the National Bank	5	exam
OC 1.3	Finance Nature	5	exam
OC 1.4	Financial fraud	5	exam
OC 1.5	Financial monitoring	5	exam
OC 1.6	Global Economy	5	exam
Total		**20**	
Optional Block 2			
OC 2.1	Business Intelligence	5	exam
OC 2.2	The financial security of the state	5	exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
OC 2.3	Finance Nature	5	exam
OC 2.4	Corporate Finance	5	exam
OC 2.5	Financial Econometrics	5	exam
OC 2.6	Behavioral finance	5	exam
OC 2.7	Public Procurement	5	exam
Total		**20**	
The total amount of compulsory components		**62**	
The total amount of optional components		**28**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Methodology and organization of scientific research. Purpose of the course - mastering modern theoretical concepts of research, their practical application in their research and to familiarize students with the basics of intellectual property.

The object of study - methodology and research methods, methods of organization, and economic, organizational and financial principles of intellectual property in the domestic and international practice. Knowledge of the subject "Methodology and organization of scientific research with the basics of intellectual property" masters needed for research and writing of master works.

The main objective of the course is to prepare specialists in economics to conduct independent research.

Agricultural policy. Educational discipline enables master methodical and methodological foundations of development and implementation of measures to support and ensure the development of agriculture in the system of linkages in the national economy, and assess from the perspective of the theory of action-state structures for the regulation of the agricultural production in the country.

The main objectives of the discipline is to acquire basic knowledge on the economic substance, character and principal components of agricultural policy; analyze the effectiveness of the bodies and institutions of agricultural policy, through various market-policy instruments; understand the features of formation of agrarian policy in countries with different levels of socio-economic development, characterized agricultural policies of individual countries and blocs.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Financial Management. Objective: mastering the ways of solving issues of financial transactions acquainted with specific problems and contradictions of operation and cash flows methods and techniques of financial manager for the implementation of professional management of financial assets of industrial and economic activity.

The task - to learn the theoretical foundations of financial management; master the methodological tools of financial management; form the theoretical and practical knowledge about the management of financial relations arising in the course of operating and investment activity; master the basics of money management company; develop skills in analyzing financial statements; learn the basics of financial management during the bankruptcy.

Financial Services Market "Objective: preparing masters in financial management i analyze financial services with a level of training that will provide them a competitive advantage in the labor market.

Objectives: To form a systemic understanding of the relationships of different actors in the financial services market and the functioning of specialized financial institutions; learn to identify the needs of consumers of financial services in specific situations and opportunities to meet these needs different types of financial services; provide a comprehensive understanding of the role of financial services i mentioned various financial institutions in the financial market and its segments; develop skills in comparative analysis of the financial services industry with the definition of the advantages and disadvantages of different types of services; teach reasonably compare financial services and make their selection, taking into account specific needs of the consumer i financial and economic situation; show the role of state institutions in the financial services market; highlight the main priority directions of state policy in the field of regulation of financial relations in the financial services market.

Budget Management. The program of the course covers the theoretical foundations of management budget process: the nature of intergovernmental relations, functions of management, stages of the budget process, and the structure of organizations involved in the budget process and so on.

The aim of the course is to provide students theoretical and practical knowledge for disclosure capabilities, skills on the organization of the budget process in Ukraine and its management and execution of the state budget. Important here is the study of the nature of intergovernmental relations and the nature of their impact on society, the disclosure laws of construction and operation of the budget system, the theoretical foundations of system of financial regulation in a market economy.

Project financing. Purpose of discipline is to form theoretical and methodological framework necessary future professionals, fluent in practice organization and management of investment activity at the enterprises of different ownership and learn to plan, analyze and evaluate the effectiveness of business - plans for investment projects.

The study of educational material will increase the overall level of training, to form the skills of independent research and analytical study of problems from the standpoint of public and state needs and interests. The object of study - a system of methods and activities of investment firms of different ownership and management.

Financial services market. Objective: To prepare masters in the field of financial management and analysis of financial services with a level of qualification that will provide them with competitive advantages in the labor market. Objective: to form a systematic understanding of the interconnections of different subjects in the market of financial services and the functioning of the system of specialized financial institutions; To teach how to identify the needs of financial services consumers in specific situations and the ability to meet these needs by different types of financial services; to provide a comprehensive understanding of the role and importance of financial services of various financial institutions in the financial market and its segments; develop the skills of comparative analysis in the field of financial services, identifying the advantages and disadvantages of different types of services; to teach reasonably to compare types of financial services and to carry out their selection, taking into account the needs of the consumer and the specific financial and economic situation; to show the role of state institutions in the financial services market; To highlight the main priorities of the state policy in the field of regulating financial relations in the financial services market.

Financial enterprises readjustment. The purpose of discipline is to develop the students theoretical and practical knowledge on issues related to financial recovery company, managing this process, the basics of crisis management in the enterprise. The

theoretical part of the course aims at familiarization with the concept and essence of financial restructuring, forms, terms, rules and sources of funding reorganization of enterprises, management of financial reorganization, controlling and auditing curative.

The objective of the discipline is depth study of mechanisms of management of financial readjustment; acquisition of knowledge of economic substance and procedure of financial reorganization of enterprises; meet the challenges of decision-making on sanitation; mastering methodological approaches to programming and rehabilitation plan, identify the most effective mechanisms for its implementation; identify the most effective forms and mechanisms of financial recovery of the company, financing conditions and forms of the formation of internal reorganization and external sources; acquiring knowledge on controlling and its role in the reorganization of the enterprise, rules and methods of curative audit; study the role of the state in the process of sanation and state support for the financial reorganization of enterprises.

Banking Management. Purpose: acquiring basic knowledge of management theory and practice of banking. Objective: To clarify the financial statements of commercial banks; explore theoretical approaches to the management of banking risks, the bank's liquidity, financial condition assessment; management liabilities; active management and fee-brokerage bank

Insurance management. purpose of teaching this course, forming the students' knowledge of the preparation and implementation of management decisions that ensure the efficient formation and use of the capacity of insurance companies and the harmonization of the financial interests of insurance consumers, owners and staff of insurance companies, intermediaries and the state.

The objective is to acquire sustainable knowledge students the theory and practice of management by the insurance company; insurance services; risk assessment; settlement of insurance claims.

Tax Management. Taxes are very complicated financial categories as they relate and reflect virtually all aspects of economic relations entities independently. The capacity of the tax system depends on the effectiveness of governance in the tax area that requires highly skilled personnel, able to participate in the development of tax laws, to tax planning, and control the correctness of calculation and timely payment to the budget of taxes and obligatory payments. The purpose of teaching this course - providing students with knowledge on taxation of necessary future specialists to manage in the field of taxation. The objective is to study the theoretical and organizational principles of tax law and management; skills control of the tax authorities, ability to explain the provisions of tax laws to solve disputable issues, submit proposals for its improvement.

Optional components of EPP

Free choice according to specialty

Optional Block 1

Agrarian risks and their insurance. Objective: theoretical knowledge and practical skills in conceptual frameworks insurance of agricultural risks, the formation of effective organizational-economic mechanism of insurance coverage farms agricultural sector.

Subject: Economic relations arising between subjects of the insurance market in the implementation of agricultural insurance. Content modules: features of agricultural insurance, agricultural insurance experience in foreign countries, crop insurance and livestock insurance, farm buildings, machinery and other property.

Monetary policy and the National Bank. The formation of future professionals specialized knowledge of the organization of the central bank monetary policy implementation, the ability to use their knowledge in the performance of operations, credit related calculations, financing of investments and the provision of other services. Study of

the National Bank of Ukraine, especially its functioning and main directions of monetary policy.

Finance Nature. Submission, generalization idea "finance - economy - ecology" runs through concept development financial nature, demand in causing an economic category due to the fact that the modern economy is recognized as an integrated system that interacts with natural systems. Aim of the course - to submit an accessible form and help students learn the basics of finance, to understand the concept and essence of natural wealth as elements of national wealth, to analyze the concept of nature in the marketplace.

Financial fraud The purpose of teaching this educational discipline is the formation of a comprehensive system of knowledge on the practice of existing financial frauds in the field of taxation, the credit and deposit industry, insurance, currency operations, operations with financial assets and payment security in order to prevent administrative responsibility for punishment, correct behavior in detection and operation regulatory and legislative norms of financial law in the branches and spheres of the financial system.

The main tasks are mastering the essence and classification aspects of financial fraud, the risks of its occurrence, understanding the place of this phenomenon in the structure of the financial system and its consequences for the well-being of the state and society, and the formation of competencies for its prevention.

Financial monitoring the course is aimed at studying the system and subjects of financial monitoring and organizing its implementation in Ukraine (theoretical and practical aspects). Consider the primary financial monitoring and its interaction with the subjects of public financial monitoring. We will analyze international standards and national legislation in the field of prevention and countermeasures against the legalization (laundering) of proceeds of crime, the financing of terrorism, and the financing of the proliferation of weapons of mass destruction. Consider government regulation and supervision in the area of financial monitoring. Risk management of criminal proceeds. Typologies of legalization (laundering) of proceeds from crime: global and domestic legalization. Responsibility in the field of prevention and counteraction to legalization (laundering) of proceeds from crime.

Global Economy. The purpose of discipline is the training of highly qualified specialists through formation of students' understanding of the conditions and factors of development, mechanisms and tools of the global economy, the realization of their intellectual mission for balanced decision-making in the context of civilizational progress. The main task - to learn and play at the professional level systematic knowledge of the global economy and to master professional skills formation strategies of economic development under the current transformation processes of globalization.

Optional Block 2

Business Intelligence. The purpose of discipline is to train highly qualified professionals who possess knowledge and skills in financial analysis; able to work as financial analysts in commercial and investment banks, management companies, funds, and enterprises of the real sector of the economy; can predict the processes occurring in the financial system and the real economy enterprises both in Ukraine and in foreign countries; can participate in the development of recommendations for management decisions based on analysis of the financial condition of entities.

The main objective of the course is the ability to generate analytical conclusion of the submitted information and research, namely the study of the structure of the company; acquiring skills formation business model of the company; studying the place and role of the business analyst in the enterprise; mastering theoretical foundations of successful business decisions; definition of tasks, functions and structure of business process

management in the enterprise; study of business process analysis and business plan of the company.

The financial security of the state in the system of economic security plays an important role of the financial component, the level of which depends on the realization of national interests and sustainable economic development. The concept of financial security is important both for the state and for businesses and the public. Ensuring financial security is particularly acute during the financial crisis, accompanied by a partial loss of internal and external solvency instability of the national currency, reduction of income, inflation, decline in revenues to budgets of all levels and special funds and so on. Study of Financial Security provides the ability to act proactively and prevent crises that finance professionals can prevent the development of pre-crisis, ensuring efficient operation both at companies and in general at the national level.

The purpose of discipline "Financial Security" is to form a knowledge system for ensuring the financial security of the state as part of the economic and national security, as well as those of its functional elements that directly affect the level of the economic system of the state in terms of global transformations.

Finance Nature. Submission, generalization idea "finance - economy - ecology" runs through concept development financial nature, demand in causing an economic category due to the fact that the modern economy is recognized as an integrated system that interacts with natural systems. Aim of the course - to submit an accessible form and help students learn the basics of finance, to understand the concept and essence of natural wealth as elements of national wealth, to analyze the concept of nature in the marketplace.

Corporate Finance. Corporate finance business finances compared to other organizational forms are most difficult internal system of operation that requires special study. The purpose of the course "Corporate Finance (Corporate Finance)" is to master the mechanisms of formation, organization, planning and financial management of joint stock companies on the basis of theoretical and practical analysis of processes of financing and lending, summarizing the provisions of relevant laws and regulations, and experience of financial and business leading foreign and domestic corporations.

Financial Econometrics. The study of economic processes (relationships) in applied econometrics carries through mathematical (econometric) model. Construct and analyze these models using actual numerical values. One of the main objectives of Applied Econometrics is the collection, processing and presentation of economic data in graphic form as tables, graphs, charts, analysis and forecasting of economic relationships.

Public Procurement. Studying system possibilities, implementing tender the process of electronic public and public procurement in Ukraine, the Prozorro information and telecommunication system, public procurements and features of accredited private trading platforms for Prozorro for public procurement, participation in international tenders in accordance with the WTO Agreement on Government Procurement (WTO GPA).

Behavioral finance The goal of studying the course is the formation of students' system of knowledge about the essence of this scientific direction, the role of behavioral finance in making decisions on financial issues, mastering the theoretical foundations and practical skills in setting issues, solving behavioral problems with the tools of mathematical methods, development of behavior mechanisms in production situations. To achieve the goal, the following tasks are set: identification of behavioral factors in various aspects of market analysis and company work; study of the mechanisms of formation of these factors in human behavior; assessment of the effectiveness of projects taking into account behavioral factors; analysis and use of various sources of information for economic calculations; the use of behavioral models, as well as the assessment of their parameters to explain the behavior of the studied economic phenomena.

Training of masters of sciences in branch of knowledge "Management and Administration" in specialty 076 "ENTREPRENEURSHIP AND TRADE" in educational program "ENTREPRENEURSHIP, TRADE AND EXCHANGE ACTIVITIES"

Form of training:	Licensed number of persons:
– Full-time and part-time	75
Duration of Training:	
– Full-time educational and professional program	1 year 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian
Qualification	Master's degree in Entrepreneurship and Trade

Concept of training

Fundamentality training in the educational and professional program "Entrepreneurship, Trade and Exchange Activities " is manifested in their practice in different sectors of the economy, in particular, agriculture.

Currently, there is globalization in almost all sectors of the economy. In agriculture, Ukraine has successfully implemented new processes world-class, high-performance computer technology, more widespread and accessible information products and so on. As in industry and agriculture more attention is paid to the wide application of international projects that are not only able to selectively concentrate some advances in science and technology, but also affect the implementation of large scale agricultural production of both large and small producers, to ensure high efficiency sales activity.

Interdisciplinary knowledge of contemporary issues and trends in agricultural science, technology boom and its impact on the environment led to the need for highly qualified specialists in society not just on economics, marketing or finance, and professionals who have combined the qualifying these characteristics is required compulsory requirement for work in today's market system.

All the above clearly points to the existing or potentially high demand for specialists in business, trade and exchange activities. That is why to understand and solve the problems of relations between businesses and the market, both nationally and internationally, as well as compliance newest global trends in the distribution of resources and products through modern global technology organization is preparing the necessary relevant experts and, in particular, masters in the field of trading, which would possess knowledge about the implementation of modern technology in the exchange activities as well as knowledge of economics and finance, the legal regulation, management and marketing, security problems in agriculture and the national economy as a whole. That is urgent for the region and for the country is the organization of an integrated system of training in the field of exchange activities directly as a specific application of agricultural technologies to address problems of economic independence Ukraine.

The training of specialists of the exchange activity at level "Master" does not carry any higher educational institution of Ukraine that, based on today's needs for specialists of this sphere is unacceptable and naturally leads to serious loss of profits. In part, this problem is solved by means of educational programs of educational institutions that train specialists with in-depth knowledge in exchange activities within other economic fields. However, their knowledge does not apply to the agricultural sector, limited usually the

stock market, and therefore are not sufficient for working on the above areas, emphasizing the uniqueness of the profession.

Educational and professional program of master's training

It involves the training of highly skilled specialists capable of forming a strategy and tactics of entrepreneurship and enterprise in the field of agrarian business, identifying market opportunities, identifying, shaping and designing business trends, identifying promising directions for the development of agribusiness, and developing alternative strategies and mechanisms for their implementation. Lets prepare professionals who through effective use of the exchange market will minimize both productive and financial risks practically all spheres of economic activity.

The scope of this study program includes activities such asholesale trade, trading securities commercial activities, evaluation activities, asset management and physical entities.

Areas of employment of graduates

The heads of enterprises and business structures in the field of agribusiness, commercial directors, private entrepreneurs, civil servants in the regulatory and supervisory bodies in the field of entrepreneurship, management of production, service, consulting and trading structures in the field of agribusiness.

Employees of brokerage firms, dealing centers, investment companies and funds, asset management companies. Employees commercial enterprices and organizations,, brokerage houses, dealing centers, investment companies and funds, asset management.

Practical training

All students undergo practical training in educational institutions of NUBiP of Ukraine, agroholdings, advanced agribusiness enterprises, and other entrepreneurial and commercial structures of the agro-industrial complex of Ukraine; on leading domestic exchanges, known in Ukraine and abroad, companies operating on the stock markets.

Proposed Topics of Master's qualification Thesis

1. Business planning of entrepreneurial activity in the field of plant growing
2. Business planning of entrepreneurial activity in the field of animal husbandry
3. Business planning of entrepreneurial activity in the field of processing of agricultural products
4. Designing the development of agribusiness in the region
5. Development of cooperation of business structures of agribusiness
6. Commodity exchange market: Status and Prospects.
7. Financial derivatives and diversification of their use stock market participants.
8. Diversification of investments on the stock exchange financial market.
9. The development of electronic trading technology in global financial markets.
10. Day-Trading on exchange market.

Curriculum of Master training
in educational program "Entrepreneurship, Trade and Exchange Activities"
(educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Methodology and organization of scientific research with the basics of intellectual property	5	exam
CC 2	Agrarian policy	5	exam
Total		**10**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 3	Business Planning entrepreneurship in agriculture	6	exam
CC 4	Stock trading on commodity markets	6	exam
CC 5	Commercial activity and business communications	6	exam
CC 6	Business project management	6	
CC 7	Competitiveness business structures	6	exam
CC 8	Innovative development of trade enterprises	5	exam
CC 9	Analysis and forecasting the stock market	5	exam
CC 10	Preparation and defense of master's qualification thesis	6	
CC 11	Internship	10	
Total		**56**	x
Optional components of EPP			
Free choice according to specialty			
OC 1	Optional subject 1	4	exam
OC 2	Optional subject 2	4	exam
OC 3	Optional subject 3	4	exam
OC 4	Optional subject 4	4	exam
Total		**16**	
The total amount of compulsory components		**64**	
The total amount of optional components		**26**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Methodology and organization of scientific research with the basics of intellectual property. The purpose of discipline: the development of knowledge on the methodology, theory method and the research process, methodological support research activities at the stages of writing a master's thesis, forming the ability to organize scientific research an issue using the whole complex of traditional methods of research, including general and special methods , The main objective of the theoretical part of the course is to familiarize students with modern concepts of scientific work, on the basis of the methodology of scientific knowledge and methods of research. The main task of the practical part - developing skills for self-education, development of skills formation and use of conscious methodological position of scientific research. As a result of the development

of the course, students should improve their ability to search, selection and processing of scientific information in the exact formulation of the problem, goals, objectives, object, object methods. Is expected to introduce students to the basics of intellectual property and directing them to master knowledge and skills regarding registration of ownership, protection, commercialization, valuation and management.

Agrarian policy. The discipline introduces the principles of formation of policy in agrarian sphere, gives the possibility to gain proficiency in methodical and methodological principles of the development and realization of the complex of actions concerning support and provision of the development of agriculture in the system of inter-branch links in national economy as well as estimate from the theoretic position practical actions of state structures concerning regulation of the agricultural production of the country.

Both national and foreign experience is studied. In case of mastering the material students get the possibility to form their own view on professional base about processes and phenomena happening in agrarian sector of the state economy.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

Business Planning entrepreneurship in agriculture. The purpose - formation of a system of knowledge on the methodology of development of business plans of enterprises and monitoring their performance. Objective: To study the theoretical principles of business planning of agricultural enterprises and practical skills to develop business plans and evaluating the effectiveness of business projects.

Stock trading on commodity markets. Discipline studies the organization and functioning of the exchange-traded market system as the main driving units and a market economy. The purpose of the study course - to give future specialists agrarian theoretical basis and practical skills of exchange activities and effective use of exchange operations in its future activities. Course description form students with knowledge of exchange trading and operation of various types of stock market.

Commercial activity and business communications. The essence and main tasks of commercial activity, and its legal bases, the basic organizational and legal forms of management. Building communication ties in business. Rationalization of trade management, solving problems of further improving the efficiency of technological processes and customer service.

Business project management. The purpose of studying the course is the formation of future specialists in contemporary system thinking and a set of special skills and abilities of the use of universal tools for the development and implementation of universal projects in order to achieve the effective existence and development of the organization.

Competitiveness business structures. The aim is to provide students with theoretical knowledge and practical skills in managing the competitiveness of entrepreneurial structures in modern economic conditions. The subject of the study of the discipline is modern concepts and methodological approaches to assessing and managing the competitiveness of business structures.

Innovative development of trade enterprises. The purpose of studying the discipline is the formation of students' theoretical knowledge about the state and problems of innovative activity of trade enterprises. The task is to learn and reproduce at a professional level systematic knowledge of the components and elements of the mechanism for stimulating the innovation process of trade enterprises.

Analysis and forecasting in the stock market. The course "Analysis and forecasting in the stock market" system examines methods of assessing the situation on the stock market, the current operation and its prediction for the future. The purpose of the

study course - to the future economic direction of specialist theoretical foundations and practical skills in the fundamental and technical analysis and implementation of forecasting stock market conditions and effectively use this knowledge in their future activities.

Optional components of EPP

Free choice according to specialty

Hedging futures and options. Students learn theory and practice of hedging. Basis and its role in hedging. Types of hedging. Hedging strategies. Futures hedging. Options and swaps hedging. Hedging in agricultural market. Futures. Options and their essense. Options trade. Basis risks. Hedging in financial markets. Arbitrage and speculation.

International stock markets. The purpose of teaching is to create a system of special knowledge of the problems and prospects of development of international relations in the field of exchange trading. Tasks of the course are: formation of a holistic understanding of the processes that characterize the international level of interoperability of national stock markets; mastery of new approaches to assess the evolutionary nature of international stock markets; mastering the culture of modern economic thinking in the field of trading with the position advanced world experience.

Public Procurement. Basic Principles of Public Procurement; methodological bases of organization of procurement activity in the electronic ProZorro Procurement System; order of formation and main functions of the tender committee; rights and responsibilities of members of the tender committee; formation of tender documentation; peculiarities and specifics of the procurement of selected items; appeal of procurement procedures in the field of public procurement, control over observance of legislation in the field of public procurement; responsibility for breach of procurement law.

E-Business. The discipline provides the formation of knowledge and skills of students on the introduction of computer technologies in business, the foundations of electronic trade technologies and their use in the activities of enterprises. Objectives of the course: to master the basic concepts of e-commerce; to get acquainted with the latest information technologies; to acquire practical skills in using electronic technologies in business.

Entrepreneurship in the field of processing of agricultural products. The purpose of the discipline is the formation of a system of theoretical and practical knowledge about the rational organization and efficiency of conducting business on processing of agricultural products. The subject of studying discipline is a set of theoretical, methodological and practical issues on the rational organization and economic efficiency of business activities in the processing of agricultural products.

Commercial Logistics. The purpose of the course is to develop the competencies of future masters in scientific substantiation and to make optimal management decisions in logistics using modern information technologies. The subject of the course is the study of commercial logistics conceptual principles, the basic principles of logistics effective use in commercial practice of enterprises, the study of features of the commercial logistics functional areas development and the formation of information support for making effective logistics decisions. In the course of studying the discipline students will learn the basic approaches to the implementation of logistics as a new paradigm of entrepreneurial activity.

Pricing in commodity markets. The purpose of discipline - to provide students with theoretical knowledge and practical skills on the formation of prices for agricultural products. Tasks of the course is to disclose problems: the theoretical foundations of pricing; legislative and legal regulation of pricing; organizational and economic mechanism of pricing; description of methods of regulation of pricing in Ukraine.

Industrial Economics. The aim is for students to master the subject, methods and relationships of the discipline "Industrial Economics" in market conditions. Tasks of the discipline: knowledge of methodological foundations of production economics; ability to distinguish and evaluate important development trends and production and economic problems of crop and livestock production; ability to determine natural and monetary data of the most important processes of agricultural production, to discuss and critically evaluate the results of activities in the context of the whole enterprise, general economic and social development; ability to use modern information technologies and economic-mathematical methods and models for the study of economic processes.

Global Economy. The purpose of discipline is the training of highly qualified specialists through formation of students' understanding of the conditions and factors of development, mechanisms and tools of the global economy, the realization of their intellectual mission for balanced decision-making in the context of civilizational progress. The main task - to learn and play at the professional level systematic knowledge of the global economy and to master professional skills formation strategies of economic development under the current transformation processes of globalization.

FACULTY OF PLANT PROTECTION, BIOTECHNOLOGY AND ECOLOGY

Dean - doctor in agricultural sciences, professor, Y.V. Kolomiiets
Tel.: (044) 527-86-99
E-mail: plantprotect_dean@nubip.edu.ua
Location: Building № 4, Room 42

Faculty organizes and coordinates educational process of master training in educational program within specialties:

Specialty 101 "Ecology"

Educational programs "Ecology and environmental protection"

Guarantor of the educational and professional program – Doctor of Biological Sciences, Professor V. Gaichenko.

Educational programs "Ecological control and audit"

Guarantor of the educational and professional program – Candidate of Agricultural Sciences, Associate Professor M.Ladyka.

Department in charge of graduate training:
Agricultural Sphere Ecology and Ecological Control
Tel.: (044) 527-81-95
E-mail: el.naumovskaya@gmail.com
Head of the department – Candidate of Agricultural Sciences, Associate Professor O. Naumovska

Specialty 162 "Biothechnology and Bioengineering"

Educational program "Environmental biotechnology and bioenergetics"

Guarantor of the educational and professional program – Doctor of Agricultural Sciences, Professor M. Lisovyy.

Departments in charge of graduate training:
Ecobiotechnologies and Biodiversity
Tel.: (044) 527-85-17
E-mail: eko_bio@nubip.edu.ua
Head of the Department – Candidate of Biological Sciences O. Y. Kvasko

Physiology, Plant Biochemistry and Bioenergetics
Tel.: (044) 527-89-66,
E-mail: physiol.biochem2021@gmail.com
Head of the Department – Doctor of Biological Sciences, ,Professor S. V. Prylutska

Specialty 202 "Plant Protection and Plant Quarantine"

Educational program "Plant Protection"

Guarantor of the educational and professional program – Doctor of Agricultural Sciences, Professor, academician of the NAAS of Ukraine M. Dolya.

Educational program "Quarantine of Plants"

Guarantor of the educational and professional program – Candidate of Agricultural Sciences, Associate Professor O. Sykalo.

Departments in charge of graduate training:

Entomology, Integrated Protection and Plant Quarantine

Tel.: 527-82-12

E-mail: kaf.izkr@gmail.com

Head of the department – doctor in agricultural sciences, professor, academician of the NAAS of Ukraine M.M. Dolya

Phytopathology named after Academician V.F. Peresypkin

Tel.: (044) 527-82-11

E-mail: phytopath_Peresupkin@ukr.net

Head of the department – PhD in Agricultural Sciences, Associate professor D. Gentosh

Training of masters of sciences in branch of knowledge "Natural sciences" in specialty 101 "ECOLOGY" educational program "ECOLOGY AND ENVIRONMENTAL PROTECTION"

Form of Training:	Licensed number of persons:
– Full-time	50
– Part-time	50
Duration of Training:	
– Full-time educational and professional program	1 year and 4 months
– Part-time	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Qualification	Master of Ecology

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.

Areas of employment of graduates

The activities of graduates of the master's program are related to the organization, provision, implementation and compliance with environmental control in the agricultural sector - monitoring, audit, certification, examination, to manage socio-economic and environmental development of agricultural areas and enterprises.

Practical training

Practical training of specialists is carried out in research farms of the National University of Life and Environmental Sciences of Ukraine: Ecological Inspectorate (regions and metropolitan district), Ministry of Environmental Protection and Natural Resources (Kyiv), Institute of Agroecology and Nature Management NAAS (Kyiv), Chornobyl - ecological biosphere reserve (Kyiv region, Ivankiv village), Drevlyansky Nature Reserve (Zhytomyr region, Narodychi village), BioNorma Group (Kyiv), Uzhansky National Nature Park (Zakarpattia region, Velyky Berezny village).

Proposed Topics of Master's qualification Thesis

1. Spatio-temporal analysis of the quality of water resources in Ros' River Basin.
2. Ecological analysis of anthropogenically altered landscapes of the Trubizh River mouth.
3. Evaluation of ways to reduce waste on the example of Auchan Ukraine hypermarket LLC.
4. The influence of military operations on the ecological state of soils.
5. Radioecological assessment of radionuclide contamination separate spots on territory of the "Drevlyanskyi" nature reserve.

Curriculum of Master training in educational program "Ecology and Environment Protection" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Modern concepts of nature management	4	exam
CC 2	Methodology and organization of scientific research	4	exam
CC 3	Sustainable development strategy	4	exam
CC 4	Business foreign language	4	exam
CC 5	Environmental legislation	4	exam
Total		**20**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 6	Civil defense	4	exam
CC 7	Environmental toxicology	5	
CC 8	Environmental control and audit	5	exam
CC 9	Environmental management	5	exam
CC 10	Environmental standardization and certification	5	exam
CC 11	Agricultural radioecology	4	exam
CC 12	System analysis of the environment	4	exam
CC 13	Experimental radioecology	4	exam
CC 14	Production Practice	8	differential credit
CC 15	Preparation and defense of master's qualification thesis	2	protection of work
Total		**46**	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Ecological control and environmental protection"			
OC 1.1	Agroecology	4	exam
OC 1.2	Environmental Impact Assessment	4	exam
OC 1.3	Agro-ecological control and management (monitoring, certification, management, inspection)	4	exam
OC 1.4	Global environmental problems	4	exam
Total		**16**	
Optional Block 2. "Radioecology and radiobiology"			
OC 2.1	Assessment of radiation risks for humans and the	4	exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
	environment		
OC 2.2	Radiation hygiene	4	exam
OC 2.3	Modern methods in radiation research	4	exam
OC 2.4	Radiation biochemistry	4	exam
Total		**16**	
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Modern concepts of nature management. Form the knowledge about the environmentally safe state of the environment, which is provided by the warning, prevention of negative influences on the deterioration of the ecological situation and the emergence of danger to human health, the ability to determine the types of environmental safety by territorial features (global, international, national, national, regional, local), for methods of providing - technogenic-ecological (radioecological, socioecological, economic-ecological and natural safety), according to objects of protection - environmental safety of the surrounding grassland and its components, ecological safety of society and man; the skills of developing and implementing modern environmental concepts aimed at protecting the environment and the health of citizens. Optimization of nature use. Form knowledge about the conditions of a balanced interaction of human society with all natural biocenoses of the biosphere. Provides skills and skills aimed at achieving an effective economic result and maximizing the economic effect of minimizing damage to the natural environment, consumption of natural resources and their reproduction, and protecting the environment from pollution and destruction.

Methodology and organization of scientific research. 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.

Sustainable development strategy. 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.

Business foreign language. The general aim of the program of teaching of foreign language for the professional purpose is formation students' professional linguistic competencies that will contribute to their efficient operating in cultural variety of training

and professional environment. The methods of search of new information in another language sources, linguistic methods of analytical study of another language sources are learned. Students study published original literature in another language and increase their lexical and grammatical skills. Methods and linguistic peculiarities of annotation and synopsis of another language sources, the principles of translation of professional oriented another language sources are studied.

Environmental legislation. Studies the system of legal norms and principles that regulate and protect public relations for the protection of the natural environment and the rational use of natural resources (environmental relations).

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

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.

Environmental toxicology. Environmental toxicology is an integrated science that is directly related to environmental protection, the overall ecology and toxicology, based on the use of advances in advanced technologies for preventing and counteracting the effects of harmful substances on biological objects of natural ecosystems. Ecological toxicology studies ecological aspects of toxicokinetic, toxicodynamic, toxicometry, reactions of biological systems to poisons, assessment of risk and harmfulness of toxins in the environment, as well as methods and technologies for preventing poisoning and detoxification of poisons in the environment.

Environmental control and audit. 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.

Ecological management. 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 standardization 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.

Agricultural Radioecology. 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.

System analysis of the environment. Investigates the general engineering training of specialists in the field of complex environmental systems analysis as the basis for studying professionally oriented disciplines and providing theoretical knowledge and practical skills in system analysis in a sufficient amount for professional specialization.

Experimental radioecology. The sources of ionizing radiation in the environment, migration of radioactive substances in different ecosystems, features of physico-chemical forms of radionuclides and the assessment of the impact on the environment and the risks associated with radioactive contamination are studied in detail. Forming skills and abilities of conducting radioecological research using radioactive isotopes, radiochemical separation methods and modern measurement methods.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Ecological control and environmental protection"

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. Provides knowledge about the normative and legislative basis of ecological-expert activity, general requirements for carrying out ecological examination, peculiarities of conducting geoecological expertise as a new scientific and practical type of activity for estimating the mechanism of co-adaptation of natural and economic subsystems, procedures and methods of geoecological expertise; students acquire the skills: to conduct an ecological examination of technologies, raw materials and products.

Agro-ecological control and management (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.

Global environmental problems. To form students' deep knowledge about the development of the global ecological crisis of the biosphere due to natural processes and anthropogenic impact on the environment, the main areas of scientific and practical solutions to environmental problems.

Optional Block 2. "Radiobiology and radioecology"

Assessment of radiation risks for humans and the environment It forms the knowledge and skills for a comprehensive assessment of the impact on human health and the quality of the environment of objects of economic activity using sources of ionizing radiation (NPP construction projects, operation of existing nuclear reactors, Alienation zone, places of temporary localization of nuclear waste, etc.) on a scale the chosen territory, provides skills for preliminary checking of compliance of projects with current legislation and safety requirements, guarantee of minimization of radioactive isotopes' inflow to the body Judah with food skills for monitoring and control operations in the event of radiation accidents to assess the extent of contamination and radiation risks

Radiation hygiene. As a result of the radiation accident in the affected areas an environment with a complex of unfavorable to the population of the environment (ecological, sanitary, hygienic, economic, economic and social) is formed. This course develops knowledge and skills in protecting people from sources of external and internal radiation when living on contaminated radionuclide territories (obtaining agricultural products that meet the requirements of DR-2006, reducing the equivalent dose of internal radiation, the feasibility of countermeasures), features of solving socio-economic problems and rehabilitation of affected areas by radionuclide contamination.

Modern methods in radiation research This course develops the knowledge and skills on the the possibility of using living organisms to determine the migratory ability of radioactive isotopes in the environment and living organism (incoming, outflow, accumulation) and the use of labeled isotopes in biological research; skills and abilities: to measure specific, volumetric radioactivity for α-, β-, γ-emitting radionuclides, to use the method of labeled atoms and compounds, and conducting autoregraphy. The peculiarities of using bioinformatics tools for assessing the influence of ionizing radiation on living organisms and grouping are considered.

Radiation biochemistry. This course develops the knowledge and skills on the basic principles of ionizing radiation action on biological molecules (nucleic acids, proteins, carbohydrates, lipids), organs, tissues and systems of the organism from the moment of energy absorption to the biological systems response; features of radiation-induced damage of membranes, nuclei and mitochondria; development of radiation sickness; radiation hormesis. The mechanisms of free radicals formation and their further transformation in the cell; sequence organism biochemical reaction depending on irradiation dose; regularities of radioprotector action for their application as remedy of protection at internal and external irradiation are considered.

Training of masters of sciences in branch of knowledge "Natural sciences" in specialty 101 "ECOLOGY" educational program "ECOLOGICAL CONTROL AND AUDIT"

Form of Training:	Licensed number of persons:
– Full-time	30
Duration of Training:	
– Full-time educational and professional program	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian
Qualification	Master in Ecology

The concept of training

The aim of education is learning theoretical bases and formation of appropriate practical skills: environmental control procedures and audit of environmental protection and balanced nature use, namely the monitoring of the environment (natural and artificially altered terrestrial and aquatic ecosystems, Hydroecological, geoecological, soil and environmental, phytosanitary, environmental reclamation, bioecological, agrarian forest-technical, socio-environmental, geoinformative); audit (risk, areas, industrial and environmental facilities); environmental passportisation (companies, territories, facilities management and natural reserve fund); inspection (of enterprises and organizations as sources of pollution); examination (activities, goods and services, draft laws and other legal acts pre, project materials and documentation from the introduction of new techniques, technologies, scientific research, software development areas) in environmental consulting, licensing, certification, which will be effectively used in the agricultural and environmental sector to the production of environmentally friendly products and materials.

Areas of employment of graduates

Graduates of the specialty "Ecological control and audit" can work as an ecologist, engineer in restoration of natural ecosystems, protection of natural ecosystems, natural resources, environment, nuclear safety; specialist, environmental management, environmental education, standardization, certification and environmental quality spheres; Inspector: radiation safety, environmental protection, nature conservation reserve fund; environmental auditor and expert on ecology.

Practical training

Practical training of specialists is carried out in research farms of the National University of Life and Environmental Sciences of Ukraine: Ecological Inspectorate (regions and metropolitan district), Ministry of Environmental Protection and Natural Resources (Kyiv), Institute of Agroecology and Nature Management NAAS (Kyiv), Chornobyl - ecological biosphere reserve (Kyiv region, Ivankiv village), Drevlyansky Nature Reserve (Zhytomyr region, Narodychi village), BioNorma Group (Kyiv), Uzhansky National Nature Park (Zakarpattia region, Velyky Berezny village).

Proposed Topics of Master's qualification Thesis

1. Features of the genetic structure of rock pigeon populations on the example of Rivne.
2. Determination of the natural capital index of Cherkasy region.

3. Ecological assessment of the park "Sukholuchcha" of the Kyiv region after military operations

4. Ecological inspection of the objects of the nature reserve fund NPP "Holosiivskyi".

5. Ecological analysis of the impact of the Hadyach landfill on the surrounding territories.

Curriculum of Master training in educational program "Ecological control and audit" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Civil defense	4	exam
CC 2	Sustainable development strategy	4	exam
CC 3	Methods and organization of scientific studies	4	exam
CC 4	Business foreign language	4	exam
CC 5	Environmental legislation	4	exam
Total		**20**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 6	Ecological inspection	6	exam
CC 7	Ecological management	6	exam
CC 8	Ecological audit	6	exam
CC 9	Environmental toxicology	6	exam
CC 10	Ecological environmental monitoring	4	exam
CC 11	Environmental control	4	exam
CC 12	Regulatory and legal regulation of environmental activities	4	exam
CC 13	Production Practice	8	differential credit
CC 14	Preparation and defense of master's qualification thesis	2	protection of work
Total		46	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Environmental control"			
OC 1.1	Environmental Risk Assessment activities	4	exam
OC 1.2	Soil and environmental monitoring and management of land resources in the agrosphere	4	exam
OC 1.3	Professional ecological expert activity	4	exam
OC 1.4	Ecotoxicological assessment of agrotechnologies	4	exam
Total		16	
Optional Block 2 " Environmental audit "			
OC 2.1	Environmental impact assessment	4	exam
OC 2.2	Strategic environmental assessment	4	exam
OC 2.3	Balanced nature management (climate change and sustainable energy)	4	exam
OC 2.4	Environmental licensing	4	exam
Total		16	

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

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.

Sustainable development strategy. 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.

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.

Business foreign language. The general aim of the program of teaching of foreign language for the professional purpose is formation students' professional linguistic competencies that will contribute to their efficient operating in cultural variety of training and professional environment. The methods of search of new information in another language sources, linguistic methods of analytical study of another language sources are learned. Students study published original literature in another language and increase their lexical and grammatical skills. Methods and linguistic peculiarities of annotation and synopsis of another language sources, the principles of translation of professional oriented another language sources are studied.

Environmental legislation. Studies the system of legal norms and principles that regulate and protect public relations for the protection of the natural environment and the rational use of natural resources (environmental relations).

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Ecological 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.

Ecological Management. 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.

Ecological Audit. 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 toxicology. Environmental toxicology is an integrated science that is directly related to environmental protection, the overall ecology and toxicology, based on the use of advances in advanced technologies for preventing and counteracting the effects of harmful substances on biological objects of natural ecosystems. Ecological toxicology studies ecological aspects of toxicokinetics, toxicodynamics, toxicometry, reactions of biological systems to poisons, assessment of risk and harmfulness of toxins in the environment, as well as methods and technologies for preventing poisoning and detoxification of poisons in the environment.

Ecological environmental monitoring. Studies the set of scientific, educational, industrial (technological) problems, which in their specificity, diversity are similar and considered as a whole from the point of view of the object studied in ecosystems of different types, forms skills of building scenarios of presentation, development of

ecosystems and research methods. objects, their components (description, explanation, interpretation, modeling, forecasting, prevention, design, construction).

Environmental control. 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.

Regulatory and legal regulation of environmental activities. 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.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Environmental control"

Environmental Risk Assessment activities 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.

Soil and environmental monitoring and management of land resources in the agrosphere. 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.

Professional ecological expert activity. Discipline ensures the formation of students' knowledge of the requirements for specialist training in accordance with the construction of higher education and scientific research, the formation of primary knowledge on the basics of ecology and perceptions of future employment, acquirement of the basic concepts and terminology of ecology and understanding of the economic aspects of the environment, understanding of ways of environmental development of society.

Ecotoxicological assessment of agrotechnologies 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.

Optional Block 2 "Environmental audit"

Environmental impact assessment. The discipline provides students with knowledge on identifying the nature, intensity and degree of danger of the impact of any type of planned economic activity on the environment and public health.

Strategic environmental assessment. The discipline provides students with knowledge about the procedure for determining, describing and assessing the consequences of state planning documents for the environment, including public health, justified alternatives, developing measures to prevent, reduce and mitigate possible negative consequences.

Balanced nature management (climate change and sustainable energy). The discipline provides students with knowledge about the rational and efficient use of natural resources, the organization of an effective system of environmental protection.

Environmental licensing. The discipline provides students with knowledge on the granting of special permits to business entities by authorized state bodies to engage in certain activities with given environmental restrictions and natural resource limits.

Training of masters of sciences in branch of knowledge "Chemical and Bioengineering" in specialty 162 "BIOTHECHNOLOGY AND BIOENGINEERING" educational program "ENVIRONMENTAL BIOTECHNOLOGY AND BIOENERGETICS"

Form of Training:	Licensed number of persons:
– Full-time	30
– Part-time	30
Duration of Training:	
– Full-time educational and professional program	1 year and 4 months
– Part-time	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian, English
Qualification	Master of Biothechnology and Bioengineering

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.

Educational and professional program of master's training

Optional block "Industrial biotechnology"

The essence of the master's program is to study classical and modern methods and techniques of biotechnological work with microorganisms - producers used in industrial biotechnology, methods of obtaining pure and accumulative crops, cultivation of aerobic and anaerobic microorganisms in laboratory conditions for use in industry, study of culture and physiology. microorganisms-producers of industrially important substances, research of features of growth of microorganisms in periodic and continuous culture for use in production of results of a practical combination of fundamental and applied researches in industrial biotechnology.

Areas of employment of 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.

Optional block "Phytobiotechnology"

The program aims to study a set of technologies that use biological processes of plant cells to obtain biomass, whole organisms or products of their life, techniques for modification, improvement, creation and reproduction of plant organisms, obtaining nutrients from them.

Areas of employment of graduates

Graduates work 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.

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 of Master's qualification Thesis

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

Curriculum of Master training in educational program "Environmental biotechnology and bioenergetics" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Philosophy of science and innovation development	4	exam
CC 2	Civil defense and Strategy of sustainable development	4	exam
CC 3	Ecology Biotechnology	5	exam
CC 4	Plant Biotechnology	5	exam
CC 5	Information Technology	4	exam
CC 6	Bioinformatics and Biological Statistics	4	exam
Total		**26**	

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 7	Methodology and organization of scientific research on the basics of intellectual property	4	exam
CC 8	Business foreign language	4	exam
CC 9	Agricultural policy	4	exam
CC 10	Instrumental methods of analysis	5	exam
CC 11	Biosafety	4	exam
CC 12	Design bioprocess	4	exam
CC 13	Biotechnology in agriculture and biotehmetody in environmental biotechnologies	4	exam
CC 14	Biomarketing of biotech products	4	exam
CC 15	Production Practice	6	
CC 16	Preparation and defense of master's qualification thesis	1	
Total		**40**	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Industrial biotechnology"			
OC 1.1	Technologies of microbiological productions	4	exam
OC 1.2	Pharmaceutical biotechnology	4	exam
OC 1.3	Biotechnology of food production	4	exam
OC 1.4	Molecular genetic bases of biotechnological productions	4	exam
Total		**16**	
Optional Block 2 "Phytobiotechnology"			
OC 2.1	Productivity of photosynthesis and nanobiotechnology	4	exam
OC 2.2	Cellular signaling	4	exam
OC 2.3	Secondary metabolism of plants	4	exam
OC 2.4	Ecophysiology	4	exam
Total		**16**	
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Philosophy of science and innovation development. 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.

Civil defense and strategy of sustainable development 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. 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.

Ecology 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.

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.

Bioinformatics and Biological Statistics. Forms knowledge of the basic methods of statistical data processing Math Card. Provides skills in mathematical processing of research results, graphics, orientation in modern concepts of bioinformatics to have a holistic view of the structure and methods of analysis of biological sequences, structure and methods of analysis of spatial structures of biological molecules, structure and methods of computer genomes, to form a holistic and a systemic and view of the organization of biological information at the molecular level.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Methodology and organization of research with the principles of intellectual property. The aim of the discipline is formation of the system of knowledge in methodology, theory of method and research process, methodical support of scientific and research activity at the stages of preparation of a Master paper, formation of the ability to organize research of a specific issue using the whole complex of the traditional methods of research including general and special methods. The main task of the theoretical part of the course is introduction to students the current concepts of research creation, the principles of methodology of scientific perception and methods of research. The main task of the practical part is the development of self-education ability, mastering skills of formation and application of perceived methodological position of research. In case of mastering the course students have to improve their skills of search, assortment and processing of scientific information, accurate formulation of a problem, aim, task, object, subject, methods of research. Introduction to students the principles of intellectual property and direction of them to gain knowledge and skills concerning registration of rights of ownership, their protection, commercialization, estimation and management are envisaged. Both national and foreign experience is studied. In case of mastering the material students get the possibility to form their own view on professional base about processes and phenomena happening in agrarian sector of the state economy.

Business foreign language. The general aim of the program of teaching of foreign language for the professional purpose is formation students' professional linguistic competencies that will contribute to their efficient operating in cultural variety of training and professional environment. The methods of search of new information in another language sources, linguistic methods of analytical study of another language sources are learned. Students study published original literature in another language and increase their lexical and grammatical skills. Methods and linguistic peculiarities of annotation and synopsis of another language sources, the principles of translation of professional oriented another language sources are studied.

Agrarian policy. The discipline introduces the principles of formation of policy in agrarian sphere, gives the possibility to gain proficiency in methodical and methodological principles of the development and realization of the complex of actions concerning support and provision of the development of agriculture in the system of inter-branch links in national economy as well as estimate from the theoretic position practical actions of state structures concerning regulation of the agricultural production of the country.

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.

Biosafety. We study the heredity and variation of organisms with artificially created new features, as well as their distribution and possible consequences for ekobiocenoses.

Design.**Bioprocess** Studying the techniques of designing biotechnological equipment and techniques needed to master the development and introduction of new bioprocess.

Biotechnology in agriculture and biotehmetody 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 agrocenosis. Biotechnological processes in ecosystems that are created during the growth of environmentally friendly crop production are explained.

Biomarketing of biotech products are considered general principles and functions, basic categories and concepts of biomarketing of biotechnology products, pricing methods, methods of promotion and marketing, the organization and control of marketing activity that forms the basis of the marketing practices of biotech products. Attention is focused on the market research products or services biotechnological direction; range planning biotechnology products in enterprises; organization processes and sales promotion services or biotech company. The market economy makes new demands to specialist biotechnology. They must be qualified, have modern means of organization of industrial and commercial activities, timely adapt to changing of marketing environment, to ensure sustainable functioning of biotech companies.

Optional components of EPP

Free choice according to specialty

*Optional Block 1 "Industrial biotechnology***"**

Technologies of microbiological productions. The discipline studies theoretical and practical aspects of microclonal propagation of plants in vitro, namely: principles and theoretical foundations of nutrient media, the influence of growth regulators on plant growth and development, physiological basis of morphogenesis, method and technique of microclonal propagation, apical dominance. Emphasis is placed on microclonal propagation of herbaceous and woody plants (cultivation of tropical and subtropical plants, technical, cereal, vegetable, fruit, berry and woody crops).

Pharmaceutical biotechnology. Provides theoretical knowledge and develops practical skills in the development and production of drugs by biotechnological methods, general requirements for biotechnological drugs of different groups, modern areas of pharmaceutical biotechnology. The subject of the discipline is the main provisions and trends in the development of pharmaceutical biotechnology in Ukraine and the world; modern principles of drug production in various dosage forms with the use of biotechnology methods - microbial synthesis, cell technologies, genetic engineering methods, the main modern types of equipment for biotechnological productions.

Biotechnology of food production. Gaining knowledge about the main types of existing food biotechnological industries; acquaintance with biological agents of food biotechnology; acquaintance with technological processes and equipment of food biotechnology; acquaintance with bioengineering and technical solutions of biological technologies used in the production of food, food additives, biologically active additives, etc .; formation of students' theoretical base of professional training on free orientation in solving practical problems in the application of biological technologies in the food industry; formation of students' scientific practical worldview, analytical thinking, which will contribute to solving global problems of today: food, human health, national security and sustainable development of the country through the introduction of the latest food biotechnological processes.

Molecular-genetic bases of biotechnological productions. The main purpose of studying the discipline is to master the theoretical bases and formation of appropriate practical skills in the study of biological objects and genetically modified organisms, methods and techniques of genotyping of valuable agricultural plants and their DNA certification, taking into account modern scientific approaches. combine perception and understanding of practical and theoretical knowledge for students of environmental and ecobiotechnological direction. . Objectives of the course: forms knowledge about methods of cloning DNA fragments, features of the structure of vectors based on prokaryotes and eukaryotes, creating libraries of genomes, restriction maps, obtaining drugs, obtaining transgenic plants and animals. As a result of studying the discipline, the master must be able to plan and select the optimal conditions for the production of recombinant DNA and

the transformation of genetic material on the basis of the latest achievements, using methodological recommendations.

Optional Block 2 "Phytobiotechnology"

Productivity of photosynthesis and nanobiotechnology. The field of modern science and technology based on the application of nanotechnology in biomedicine through the use of bionanostructures as a matrix for the synthesis of nanomaterials and tissue engineering as components of electronic devices, nanocontainers for targeted delivery of pharmacological agents and nanorobots for terrorism

Cellular signaling. The course is devoted to the study of the implementation of genetic information in the process of ontogenesis. In the course of studying the course students get acquainted with the morphological aspects of development, as well as with the biochemical and molecular genetic mechanisms that accompany them in the process of embryonic and postnatal development. Particular attention is paid to the molecular genetic aspects of the processes of determination and differentiation of cells, as well as their stability during ontogenesis.

Secondary metabolism of plants. The task of the discipline is to get acquainted with the secondary metabolism of plants, to characterize the main groups of biologically active substances of plant origin, mechanisms of their synthesis, chemical properties and physiological action, to identify the most promising BAS for use in pharmacological, food and light industries.

Ecophysiology. Studies the role of major environmental factors in plant life, ways of plant adaptation to environmental factors, the relationship of plants with other organisms, human impact on the plant world, periodic phenomena in plant life. After completing the course, students will be able to identify the adaptive features of plants of different ecological groups, organize and conduct research in the field of plant ecophysiology, work independently with the scientific literature, use theoretical

Training of masters of sciences in branch of knowledge "Agricultural science and food" in specialty 202 "PLANT PROTECTION AND PLANT QUARANTINE" educational program "PLANT PROTECTION"

Form of Training:	Licensed number of persons:
– Full-time	75
– Part-time	50
Duration of Training:	
– Full-time educational and professional program	1 year and 4 months
– Part-time	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian, English
Qualification	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.

Educational and professional program of master's training

Optional Block "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.

Areas of employment of graduates

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.

Optional Block "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.

Areas of employment of graduates

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).

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., Horodyshche district, Mliev).

State Service of Ukraine for Food Safety and Consumer Protection.

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 of Master's qualification Thesis

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 microbal cenosiss 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.

Curriculum of Master training in educational program "Plant protection" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Business foreign language	4	exam
CC 2	Methodology and organization of scientific research on the basics of intellectual property	4	exam
CC 3	Biosafety in Plant Protection	4	exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
CC 4	Logistic and communications in Plant Protection	4	exam
CC 5	Economic and organization of agricultural service	4	exam
Total		**20**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 6	Complex systems of crop plant protection from diseases	4	exam
CC 7	Phytofagous insect management	4	exam
CC 8	Management of the number of drills in agricultural societies	4	exam
CC 9	Phytosanitary documentation and standardization	4	exam
CC 10	Toxicology of Pesticides	4	exam
CC 11	Technologies of cultivation and use of organisms in biological of plants protection	4	exam
CC 12	Epiphytotiology	4	exam
CC 13	Crop Seed pathology	4	exam
CC 14	Disinfection of agricultural products	4	exam
CC 15	Preparation and defense of master's qualification thesis	4	
CC 16	Production Practice	6	
Total		**46**	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Biological justification of obligate and facultative pathogens control"			
OC 1.1	Actinomitsetes diseases of plant	4	exam
OC 1.2	Physiological and biochemical aspects of plant resistance to disease	4	exam
OC 1.3	Mycotoxicology	4	exam
OC 1.4	Pathogenesis in plant production	4	exam
OC 1.5	Pathological process of plants' root system	4	exam
Total		**16**	
Optional Block 2 "Phytosanitary monitoring and forecasting"			
OC 2.1	Insect pathology.	4	exam
OC 2.2	Insects ecology	4	exam
OC 2.3	Technical entomology	4	exam
OC 2.4	Insect physiology	4	exam
OC 2.5	Control of biota of cultural phytocenoses	4	exam
Total		**16**	
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Business foreign language. The general aim of the program of teaching of foreign language for the professional purpose is formation students' professional linguistic competencies that will contribute to their efficient operating in cultural variety of training and professional environment. The methods of search of new information in another language sources, linguistic methods of analytical study of another language sources are learned. Students study published original literature in another language and increase their

lexical and grammatical skills. Methods and linguistic peculiarities of annotation and synopsis of another language sources, the principles of translation of professional oriented another language sources are studied.

Methodology and organization of research with the principles of intellectual property. The aim of the discipline is formation of the system of knowledge in methodology, theory of method and research process, methodical support of scientific and research activity at the stages of preparation of a Master paper, formation of the ability to organize research of a specific issue using the whole complex of the traditional methods of research including general and special methods. The main task of the theoretical part of the course is introduction to students the current concepts of research creation, the principles of methodology of scientific perception and methods of research. The main task of the practical part is the development of self-education ability, mastering skills of formation and application of perceived methodological position of research. In case of mastering the course students have to improve their skills of search, assortment and processing of scientific information, accurate formulation of a problem, aim, task, object, subject, methods of research. Introduction to students the principles of intellectual property and direction of them to gain knowledge and skills concerning registration of rights of ownership, their protection, commercialization, estimation and management are envisaged.

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. 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.

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.

Economic and organization of 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.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

Complex systems of crop plant protection from diseases. Using the newest informational and specialired technologies of plant prection Against diseases. The control of deyelopment 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.

Phytosanitary documentation and standardization Includes the study of basic regulatory documents that regulate the effective implementation of various technological operations in plant protection, the main legal aspects of the application of various

pesticides in crop production. Attention is paid to the laws on standardization and safety of crop production.

Management of the number of drills in agricultural societies - The content of the discipline involves the study of the factors that regulate the number of weeds in the phytocenoses of crops, environmental and economically sound principles of integrated protection of crops from weeds.

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

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.

Technologies of cultivation and use of organisms in biological of plants protection the discipline involves studying the current state of the development of useful insects in Ukraine and in the countries of the world. After studying the discipline, the Master must be familiar with the technology of the cultivation of useful insects on host insects and on artificial nutrient media and be able to use these populations in the biological and integrated protection of plants from pests in open and closed soils.

Epiphytotiology. 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, saprotrophytic mycobiota of seed.

Disinfection of agricultural products. 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.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "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 actinomitsetes diseases. Diagnostics of symptoms of actinomitsetes 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. 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.

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.

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.

Optional Block 2 "Phytosanitary monitoring and forecasting"

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.

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.

Control bioti cultural fitotsenoziv distsiplina scho vivchaє sistemi Zahist cultural fitotsenoziv od shkidlivih organizmiv of metoyu steel їh formuvannya that funktsionuvannya, otrimannya in an assortment that optimumi yakisnoї that bezpechnoї fitoproduktsiї fallow od obranih napryamkiv її virobnitstva, of urahuvannyam ekonomichnih that prirodoohoronnih parametriv toscho. Vivchennya of the foundations of discipline to allow maybutnim fahivtsy to reject the knowledge of effective control economically and corny biota of young cultural phytocenoses in the minds of Ukraine.

Training of masters of sciences in branch of knowledge "Agricultural science and food" in specialty 202 "PLANT PROTECTION AND PLANT QUARANTINE" educational program "QUARANTINE OF PLANTS"

Form of Training:	Licensed number of persons:
– Full-time	50
Duration of Training:	
– Full-time educational and professional program	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian, English
Qualification	inspector Plant Quarantine

The concept of training

In the process, students receive theoretical and practical knowledge and skills for the protection and quarantine of plants based on the latest methodology of scientific activities for effective implementation of the tasks of educational-scientific-production and innovation. Experts in the field of protection and quarantine of plants study of harmful and beneficial insects, mites, rodents, weeds, flowering parasites, venerated, plant diseases (fungal, bacterial, viral and other) and protection of crops from pests and learning to provide advice to the specialists of the farms, farmers and private owners in carrying out activities of protection of agricultural crops from pests and compliance of their control.

Educational and professional program of master's training

Optional block "Quarantine of Plants"

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.

Areas of employment of graduates

Graduates are able to work as inspectors in the State Veterinary and Phytosanitary Service of Ukraine and its regional branch; quarantine laboratories in positions entomologist, plant pathologist, herboloha, nematoloha; in research institutions of Ukraine as researchers, technicians and others.

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., Horodyshche district, Mliev).

State Service of Ukraine for Food Safety and Consumer Protection; Ministry of Ecology and Natural Resources of Ukraine, Ministry of Agricultural Policy of Ukraine;

agency of firms in Ukraine producing pesticides: Syngenta, Monsanto, BASF, Arysta Life Science, Bayer and others.

Proposed Topics of Master's qualification Thesis

1. Phytosanitary measures and diagnostics of quarantine and non-quarantine phytophagous planting material of fruit and berry crops.
2. Phytosanitary measures to protect crops (plantations) from quarantine insects, phytophagous, pathogens of agricultural crops.
3. Analysis of phytosanitary risk of quarantine insect species from list A1.
4. Influence of biotic factors on the development of quarantine phytophagous insects in protected soil conditions.
5. The activity of enzymes and their role in plant resistance to disease.
6. Study of the role of mycotoxins in the development of plant diseases.
7. Stability of structures of microbial cenoses of the main types of soils at various use.
8. Complex action of post-emergence herbicides on crops of cereals (legumes, technical, oilseeds, vegetables) on quarantine weeds.
9. Structure, species composition and system of measures for protection of agrobiocenoses of field crops sown with imported planting material.
10. Phytosanitary diagnostics of imported plant material entering Ukraine for the presence of regulated quarantine and non-quarantine phytophagous insects.

Curriculum of Master training in educational program "Quarantine of Plants" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Biosafety in Plant and Quarantine Protection	4	exam
CC 2	Methodology and organization of scientific research on the basics of intellectual property	4	exam
CC 3	Business foreign language	4	exam
CC 4	Economic and organization of agricultural service	4	exam
CC 5	Phytosanitary law and international cooperation	4	exam
Total		**20**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 6	Integrated plant protection	6	exam
CC 7	External and internal plant quarantine.	4	exam
CC 8	Methods for inspection and examination of objects of regulation	4	exam
CC 9	Quarantine pests	6	exam
CC 10	International phytosanitary standards	4	exam
CC 11	Quarantine pest risk evaluation	4	exam
CC 12	Desinfection of Management objects	4	exam
CC 13	Preparation and defense of Master's qualification Thesis	10	
CC 14	Production Practice	4	

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
Total		**46**	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Quarantine of Plants"			
OC 1.1	Adventist pests	4	exam
OC 1.2	Geography quarantine organisms	4	exam
OC 1.3	Harmful organisms Ukraine in the international phytosanitary	4	exam
OC 1.4	Quarantine of forest crops	4	exam
OC 1.5	Radio control of food products	4	exam
Total		**16**	
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

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. 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.

Methodology and organization of research with the principles of intellectual property. The aim of the discipline is formation of the system of knowledge in methodology, theory of method and research process, methodical support of scientific and research activity at the stages of preparation of a Master paper, formation of the ability to organize research of a specific issue using the whole complex of the traditional methods of research including general and special methods. The main task of the theoretical part of the course is introduction to students the current concepts of research creation, the principles of methodology of scientific perception and methods of research. The main task of the practical part is the development of self-education ability, mastering skills of formation and application of perceived methodological position of research. In case of mastering the course students have to improve their skills of search, assortment and processing of scientific information, accurate formulation of a problem, aim, task, object, subject, methods of research. Introduction to students the principles of intellectual property and direction of them to gain knowledge and skills concerning registration of rights of ownership, their protection, commercialization, estimation and management are envisaged.

Business foreign language. The general aim of the program of teaching of foreign language for the professional purpose is formation students' professional linguistic competencies that will contribute to their efficient operating in cultural variety of training and professional environment. The methods of search of new information in another language sources, linguistic methods of analytical study of another language sources are learned. Students study published original literature in another language and increase their lexical and grammatical skills. Methods and linguistic peculiarities of annotation and synopsis of another language sources, the principles of translation of professional oriented another language sources are studied.

Economic and organization of 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.

Phytosanitary law and international cooperation. Provides study phytosanitary rules of import from abroad, transportation within the country, and exports of agricultural products. Study on plant quarantine laws in Ukraine and familiarization with foreign experience that the regulation in phytosanitary field.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

Integrated plant protection. The discipline studies the strategy and tactics of integrated protection of phytocoenoses from biotic, abiotic and anthropogenic factors on the nature-based basis. It takes into account modern and up-to-date monitoring systems for beneficial and harmful biodiversity in accordance with the phases of growth and development of protective plants.

External and internal plant quarantine. The course examines the procedure of phytosanitary control of import and export objects adjustment at the state border of Ukraine, at home to prevent the importation into the country of quarantine organisms. And organization, methods, timing control surveys farmland to detect quarantine organisms.

Methods for inspection and examination of objects of regulation. The most responsible chain system of quarantine measures is to determine the quarantine status of goods imported from abroad, determined the review and phytosanitary examination.Mastering the technique of detection of quarantine and other hazardous pests, plant diseases and weeds, mastering the methods of production micropreparations, storage of samples and prevention of quarantine rules. methods of inspection and sampling of the regulated objects, vehicles and phytosanitary examination method of considering diversity import-export trading.

Quarantine pests. The main goal of discipline is to study the biology of quarantine features species of insects, diseases, weeds missing in Ukraine, scientific substantiation of pest risk in case of delivery and possible acclimatization in our country, their harmful for agriculture, forestry and landscape management, potential environmental and economic damages as a result of their life.

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

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.

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.

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.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Quarantine of Plants"

Adventive 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.

Geography quarantine organisms. Study centers of origin of pests and climatic conditions in which these species live in phytocenoses. Possible ways of their settlement and entry into Ukraine.

Harmful organisms Ukraine in the international phytosanitary. We consider the species that may be harmful to other countries. In case of detection in plant production need additional treatments.

Quarantine of forest crops The course involves the study of biological peculiarities of regulated pests of forest and wood products, ways of distribution and products, which may enter the territory of Ukraine; methods of survey of forest plantations, inspection of forest materials for the detection of forest quarantine organisms and sampling methods; integrated management of harmful organisms in forestry.

Radio control of food products The main disciplines are radio control of food products, which must be carried out from behind the cordon, instead of radionuclides in food products, water sports, drinking food.

FACULTY OF LAND MANAGEMENT

Dean – Doctor of Economics, Professor Ievsiukov Taras Oleksiyovych
Tel.: (044) 258-05-25
E-mail: landuse_dean@nubip.edu.ua
Location: Building № 6, Room 219

Faculty (ERI) organizes and coordinates educational process of master training in education program within specialties.

Specialty 193 "Geodesy and Land Management"

Educational program "Geodesy and Land Management"

Guarantor of the educational and professional program – Doctor of Economics, Professor Martyn Andriy Hennadiyovych

Departments in charge of graduate training:

Geodesy and Cartography
Tel.: (044) 258-05-25
E-mail: kovalchukip@ukr.net
Head of Department – Doctor of Geographical, Professor Kovalchuk Ivan Platonovych

Land Resources Administration Management
Tel.: (044) 258-05-25
E-mail: uzr_k@ukr.net
Head of Department – Doctor of Economics, Professor Dorosh Ol'ha Stepanivna

Land cadastre
Tel.:(044) 258-05-25
E-mail: natazv@ukr.net
Head of Department – PhD in Economics, Associate Professor Medynska Nataliia Vasylivna

Geoinformatics and Aerospace Research of the Earth
Tel.:(044) 258-05-25
E-mail: kokhan_s@nubip.edu.ua
Head of Department – Doctor of Technical, Professor Kohan Svitlana Stanislavivna

Land-use Planning
Tel.: (044) 258-05-25
E-mail: martyn@nubip.edu.ua
Head of Department – Doctor of Economics, Professor Martyn Andriy Hennadiyovych

Training of masters of sciences in branch of knowledge “Architecture and Construction” in specialty 193 “GEODESY AND LAND MANAGEMENT” educational program “GEODESY AND LAND MANAGEMENT”

Form of Training:	Licensed number of persons:
– Full-time	90
– Part-time	85
Duration of Training:	
– Full-time educational and professional program	1,5 years
– Part-time	1,5 years
Credits ECTS:	
– educational and professional program	90
Language of teaching	Ukrainian, English
Qualification	Master of Science in Geodesy and Land Management

The concept of training

The concept of training for specialty 193 “Geodesy and Land Management” 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.

Educational and professional program of master's training

Optional Block “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.

Areas of employment of graduates

Setting the boundaries of land plots, approval of boundaries with adjacent land users, making the cadastral plan.

Optional Block “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.

Areas of employment of graduates

Inspection activities in the field of land use and land conservation, prediction of land use changes, restrictions in land use and carry their registration.

Optional Block "GIS in Land management"

Development and filling modern cadastral information systems.

Areas of employment of graduates

Modern GIS and remote sensing data necessary for carrying out work on the land, in municipal information systems, GIS management areas.

Optional Block "Evaluation 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.

Areas of employment of graduates

Regulatory and expert evaluation of land of all categories and custom real estate.

Optional Block "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.

Areas of employment of graduates

Creation of maps of land use, zoning maps and zoning, optimizing land use, land inventory.

Practical training

Curriculum of Master training on specialty "Geodesy and Land Management" 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 of Master's qualification 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.
11. Topographic and geodetic support of efficient use of lands for various purposes.

Curriculum of Master training in educational program "Geodesy and Land Management" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Business Foreign Language	4	Exam
CC 2	Methodology and Organization of Scientific Research on the Basics of Intellectual Property	4	Test
CC 3	Examination of Design and Survey Documentation	4	Test
CC 4	Land policy	4	Test
CC 5	Monitoring of Land Relations	4	Exam
CC 6	Standardization in Topographic and Geodetic Activities and Land Management	4	Exam
CC 7	Regulation of the Land and Real Estate Market	4	Test
CC 8	Organization of Topographic and Geodetic Activities and Land Management Works	4	Exam
CC 9	Information Technology and Patenting of Scientific Research	4	Test
CC 10	Economics of Land Use and Land Management	4	Exam
Total		**40**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	Test
OCP 2	Choice from the catalog 2	4	Test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 11	Land Management and Real Estate Development	4	Exam
CC 12	Monitoring of Land Use	4	Exam
CC 13	Design Engineering	4	Exam
CC 14	Development of Real Estate Cadastres	4	Exam
CC 15	GIS in Cadastral Systems	4	Exam
CC 16	Production Practice	4	Test
CC 17	Preparation and defense of master's qualification thesis	2	Work protection
Total		**26**	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Land Management and Cadastre"			
OC 1.1	Systems of Automated Design in Land Management	4	Exam
OC 1.2	Territorial planning and Spatial Development	4	Exam
OC 1.3	Management of Quality of Land Surveying Works	4	Exam
OC 1.4	Standardization in Land Management and Cadastre	4	Exam
Total		**16**	
Optional Block 2 "Land Conservation"			
OC 2.1	Formation of agrolandscapes	4	Exam
OC 2.2	Evaluation and Forecast of Land Quality	4	Exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
OC 2.3	Land Use Control	4	Exam
OC 2.4	Formation of Restrictions and Burdens in Land Use	4	Exam
Total		**16**	
Optional Block 3 "GIS in land management"			
OC 3.1	Geoinformation Modeling	4	Exam
OC 3.2	Methods of Remote Sensing	4	Exam
OC 3.3	Geospatial analysis	4	Exam
OC 3.4	Integration of GIS, RS and GNSS in Geosystem Monitoring	4	Exam
Total		**16**	
Optional Block 4 "Evaluation of Land and Property"			
OC 4.1	Information Support of Land Valuation	4	Exam
OC 4.2	Registration of Real Property Rights	4	Exam
OC 4.3	Cadastres of Natural Resources	4	Exam
OC 4.4	Valuation of Land and Real Estate	4	Exam
Total		**16**	
Optional Block 5 "Geodetic-Cartographic Technologies in Land Management"			
OC 5.1	Computer Technologies in Cartography	4	Exam
OC 5.2	Geospatial Data Infrastructure	4	Exam
OC 5.3	Topographic, Geodetic and Cartographic Supply of Land Management	4	Exam
OC 5.4	Natural Resource Mapping	4	Exam
Total		**16**	
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Business Foreign Language. The purpose of studying this discipline is to form in students the skills and abilities of business communication in a foreign language at the level of an autonomous experienced user (C1), which provides the necessary communicative competence in situations of professional activity in oral and written forms; mastering the latest professional information through foreign sources.

Methodology and Organization of Scientific Research on the Basics of Intellectual Property. Scientific research in the field of land management affects the public product. The results of scientific research in land management are an intermediate product of production. But their role in the organization of land relations and in the economy of land use. Implementation of socio-economic and investment programs requires the training of appropriate high-skilled personnel who possess the methodology and methods of scientific research on problematic rational use and protection of land, land management, land economics and land management.

Examination of Design and Survey Documentation. 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.

Land policy. The purpose of the course is to master the methodological and methodological foundations of development and implementation of a set of measures to support and ensure the development of agriculture in the system of intersectoral relations

in the national economy, as well as assess the theory of practical actions of government agencies to regulate agro-industrial production.

Monitoring of Land Relations. The aim of the course is to form students' theoretical knowledge, skills and practical skills in obtaining information on the current state of land resources, assessing the levels of negative impact on them, assessing soil pollution, developing scientifically sound recommendations for environmental measures to protect and restore land.

Standardization in Topographic and Geodetic Activities and 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.

Regulation of the Land and Real Estate Market. 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.

Organization of Topographic and Geodetic Activities and Land Management Works. 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.

Information Technology and Patenting of 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.

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.

Optional components of EPP

Free choice according to the preferences of students from the list of disciplines

Choice from the catalog 1

Choice from the catalog 2

Annotations of disciplines see by the link https://nubip.edu.ua/node/67362.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

Land Management and Real Estate Development 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.

Monitoring of Land Use. The purpose of the discipline is learning and gaining listeners required theoretical knowledge and practical skills in monitoring land.

Design Engineering. 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.

Development of Real Estate Cadastres. 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.

GIS in 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.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Land Management and Cadastre"

Systems of Automated Design in Land Management. The course involves studying technologies of automation of land management process, the finalresult of which is a set of land-use planning documentation sufficient forfurther formation of land plots or other land objects. We consider the practical aspects of using special software, automated data banks and peripherals.

Territorial planning and Spatial Development. The course examines the trends and patterns of settlement, organization of production, the functioning of the urban economy, social services, urban transportation systems, street and road network and their components, systems of engineering equipment and engineering site preparation, landscaping, landscape architecture. The modern urban ecology issues and resource conservation are reviewed. We study the principles of development planning, management of space resources to meet the needs of the population and the economy.

Management of Quality of Land Surveying Works. 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.

Standardization in Land Management and Cadastre. 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.

Optional Block 2 "Land Conservation"

Formation of agrolandscapes. 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.

Evaluation and Forecast 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.

Land Use Control. Measures system in the field of land protection: regulation and control, protecting land from harmful human impact, improve soil fertility, standardization. Engineering methods of agricultural landscapes constructing. Technology for the land protection of from degradation processes. Regulations in the field of land protection and reproduction of soil fertility. Land protection in forest and water management; land protection of environmental and other purposes.

Formation of Restrictions and Burdens in Land Use. The course is designed to help students acquire theoretical knowledge and practical skills to solve problems related to the formation and effective functioning of the institution of restrictions on land use and encumbrances on land rights. In particular, the theoretical and methodological foundations of their formation, providing scientifically sound proposals for improving regulatory and legal support for their effective functioning. During the course, applicants learn methodological approaches to the assessment of lost income and compensation for losses and damages caused by restrictions on land use. Applicants master the features of planning and design of territorial restrictions on land use in land management schemes and projects, as well as the procedure for registration of territorial restrictions on land use, land plots within the State Land Cadastre.

Optional Block 3 "GIS in land management"

Geoinformation Modeling. The course provides learning basic programming skills in C++.

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 analysis. Discipline provides theoretical background of geoinformation analysis and spatial modeling in GIS. There are geographical models of the real world, types of spatial data analysis, principles and technologies of neighborhood analysis, as well as distance analysis, analysis of attributes, reclassification, overlay operations, analysis of location of objects, change detection analysis, statistical surfaces within the course. Theoretical basis and practical application of global and local interpolation methods are reviewed.

Integration of GIS, RS and GNSS in Geosystem Monitoring. Discipline provides theoretical basis and practical skills of integration various geospatial data including remote sensing information and GNSS data in GIS, principles of geomodeling to serve soil rational use and soil conservation as well as monitoring of agricultural resources.

Optional Block 4 "Evaluation of Land and Property"

Information Supply of Land Evaluation. 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 Real 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.

Cadasters of Natural Resources. The content and methodological support of the discipline is aimed at developing students' knowledge and practical skills about forming database of natural resources cadasters (including water, forests, territories and objects of nature reserves, spas, etc.), their use in solving problems of local territories management and individual land use.

Valuation of Land and Real Estate. 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.

Optional Block 5 "Geodetic-Cartographic Technologies 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).

Geospatial Data Infrastructure. Content of the discipline is intended to form an idea of the national spatial data infrastructure (NSDI), its structure, purpose, function, the need to fill it, and its role in the production problems related to land management. The features studied are related to legal and institutional framework for the establishment and development of NSDI to ensure the functioning of the production, updating, processing, storage, delivery and use of geospatial data in various spheres of society and state, expansion of the modern geospatial products and services, and integration into the European spatial data infrastructure (INSPIRE).

Topographic, Geodetic and Cartographic 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.

Natural Resource Mapping. Classification of thematic maps and ways to design legends according to their types are shown. The possibilities to display various objects, processes and phenomena through different ways of map image are explained. The main methods of creating thematic maps, the basic content of their ways and their conclusion and approval are reviewed. During laboratory classes, students fix theoretical knowledge and gain practical skills for the creation, analysis and evaluation of thematic maps with the QGIS software.

FACULTY OF INFORMATION TECHNOLOGY

Dean – Dr.Sc. in Pedagogics, associate professor Olena Glazunova
Tel.: (044) 527-83-51
E-mail: o-glazunova@nubip.edu.ua
Location: Building 15, room 201

Faculty organizes and coordinates educational process of master training in educational programs within specialties:

Specialty 051 "Economy"

Educational program "Economic Cybernetics"

Guarantor of the educational and professional program – Dr.Sc. in Economics, professor, Nataliia Poprozman

Graduating department:
Economic Cybernetics
Tel.: (044) 527-85-67
E-mail: ciber_chair@nubip.edu.ua
Head of department – Dr.Sc. in Economics, professor, Dmytro Zherlitsyn

Specialty 121 "Software engineering"

Educational programs "The software of information systems"

Guarantor of the educational and professional program – Ph.D. in Physical and Mathematical Sciences, associate professor Kyrychenko Viktor

Graduating department:
Computer Sciences
Tel.: (044) 527-87-23
E-mail: iusprog@nubip.edu.ua
Head of department – Ph.D. in Engineering, associate professor Bella Golub

Specialty 122 "Computer science"

Educational programs "Information Managing Systems and Technologies"

Guarantor of the educational and professional program – Ph.D. in Economics, Oleg Gustera

Educational program"Computer Ecological and Economic Monitoring"

Guarantor of the educational and professional program – Dr. D. in Engineering associate professor Viktor Semko

Graduating department:
Computer Sciences
Tel.: (044) 527-87-23
E-mail: iusprog@nubip.edu.ua
Head of department – Ph.D. in Engineering, associate professor Bella Golub

Specialty 123 "Computer engineering"

Educational programs "Computer systems and networks"

Guarantor of the educational and professional program – Ph.D. in Engineering, associate professor Vadym Shkarupylo

Graduating department:
Computer Systems, Networks and Cybersecurity
Тел.: (044) 527-81- 99
E-mail: csn@it.nubip.edu.ua
Head of the department – Ph.D. in Pedagogics, associate professor Dmytro Kasatkin

Training of masters of sciences in branch of knowledge "Social and Behavioral Sciences" in specialty 051 "ECONOMY" educational program "ECONOMIC CYBERNETICS"

Form of training:	Licensed number of students:
– full-time	25
Duration of Training:	
– full-time educational and professional program	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
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 behavior research, the theory and practice of decision-making, market development modeling, 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.

Educational and professional program of master's training

This program helps students develop a comprehensive understanding of enterprise-wide management for all foreseeable threats. Our graduates are well-prepared to tackle the organizational challenges relating to: risk assessment, response, communication and monitoring, regulatory compliance, and crisis management.

The program explores the individual elements of organizational risk management utilizing the emerging enterprise risk management principles and standards. Students have the opportunity to attain a comprehensive and deep understanding of how leading organizations successfully deal with both upside and downside risks in a manner that increases companies value and assures the continuity of operations.

Areas of employment of graduates

The Master's program provides an in depth understanding of risk and their application in practice both for financial and non-financial organizations. This program is designed to provide you with the skills to excel in a role as a risk manager, risk and insurance manager, risk analyst or clinical risk manager within a variety of organizations and sectors.Therefore, they can be employed as: head of research center 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 qualification Theses

1. Agricultural risks in terms of incompleteness institutional changes.
2. Risks evaluation of full scale agricultural sector taxation.
3. 4. Real risks evaluation of agricultural sector crediting.
4. Influence of agriculture manager risk aversion on business structure.
5. Risk assessment of innovation in the agricultural business.
6. Ecological and economic component modeling of the agricultural innovative proceses.
7. Size dependent farm optimization problem modeling in agricultural sector.
8. Sustainable economic growth and longtime optimization.
9. The use of financial and tax reporting in the environmental and economic modeling.
10. The methodology of forecasting key indicators of regional socio-economic development.

Curriculum of Master training in educational program "Economic cybernetics" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1.	Global Economy	4	exam
CC 2.	Global Information Resources	4	exam
CC 3.	Methodology and organization of research on the basics of intellectual property	4	exam
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC4.	Business Process Modeling	4	exam
CC5.	Project management models	4	exam
CC6.	Quantitative methods in agrarian economics and natural resource management	4	exam
CC7.	Intellectual Data Analysis	4	exam
CC8.	Managerial Economics	6	exam
CC9.	Work Practice	2	
CC10.	Research practice	15	
CC11.	Preparation and defense of Master's qualification thesis	15	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Digital economy"			
OC 1.1	Blockchain technologies	4	exam
OC 1.2	Big Data Analytics	4	exam
OC 1.3	Analytics and Forecasting with Python	4	exam
OC 1.4	Modeling with R	4	exam
Optional Block 2. "Risk management"			
OC 2.1	Risks in agricultural production.	4	exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
OC 2.2	Regional economy models.	4	exam
OC 2.3	Ecological-economic risks.	4	exam
OC 2.4	Management of information resources	4	exam
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Global Economy. The economic nature of global transformations. Of the global economy. Regulatory institutions of the global economy. Political economy of the global economic cycle. Mechanisms of functioning of global markets. Competitive leadership of global corporations. The process of the global economy. Technological resources of global economic development. The human resources of the global economy. Civilization dimensions of global economic processes. Global context of Ukrainian economy.

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

Methodology and organization of research on the basics of intellectual property. Organizational structure of the scientific team. Planning of research. Conducting research and experimental design in the research work. Intellectual Property Law as the results of human creativity. Intellectual property. State System of Intellectual Property. The international intellectual property system. The right of intellectual property as an investment and goods. Valuation of intellectual property. Protection of intellectual property rights.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Business Process Modeling. The concept and relevance of a business process. The dimensions of model quality and their measurement. The process of modeling and modeling methods. The social dimensions of the modeling process: roles, group behavior, consensus building. The Business Model Canvas: A Tool for Entrepreneurs and Innovators. The Customer Segments. The Value Propositions. Channels and Customer Relationships. Revenue Streams and Key Resources. Key Activities and Key Partnerships. The Cost Structure. Presenting the Business Model.

Project management models. Project management environment. System approach in project management. Project analysis. Investment research and project financing. Business project planning. Project management software and hardware. Project activity

Quantitative methods in agrarian economics and natural resource management. Defining the current tasks of quantitative research of economic processes under the conditions of incomplete institutional transformations. Building models of the domestic food market in a country with an open economy. Evaluating the effectiveness of different forms of agricultural business using econometric methods. Forecasting trends in

the development of the world economy and its impact on the development of national agricultural production

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.

Managerial Economics. Theoretical and practical aspects of managing a company's economy are studied in this discipline. Key topics include financial, risk and knowledge management, strategic and operational planning, performance monitoring and efficiency improvement. Students will gain knowledge and skills that will help them become successful managers in the field of agrarian economics and natural resource management.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Digital economy"

Blockchain technologies. Principles of operation of blockchain technology, basic forms and methods of cryptocurrency mining; mechanism for conducting and approving cryptocurrency transactions, principles of creation and operation of smart contracts, basic features of Solidity programming language; areas of application of blockchain technology

Big Data Analytics. The concept of large data (Big Data). Structured and unstructured data. Relational and non-relational databases and data warehouses. Technology processing large amounts of data Introduction to Hadoop and typical examples of use. System Architecture Hadoop. Working with HDFS – distributed file system Hadoop. MapReduce: methodology and technology of distributed computing. Hadoop and data warehouse, application data storage Apache Hive; Apache Pig - a platform for analyzing large data sets; HBase – DBMS for processing large data sets. The use of large data analysis technology in business.

Modeling with R. R language essentials. The R environment. Probability and distributions. Simple linear regression. Residuals and fitted values. Prediction and confidence bands. Correlation. Multiple regression. Model specification and output. Model search. Linear models. Nonlinear curve fitting. Self-starting models.

Analytics and Forecasting with Python. Practical skills in using Python for data analysis and forecasting future trends. Utilizing Python libraries such as NumPy, Pandas, and Matplotlib for data processing, data visualization, and building forecasting models. Key approaches to statistical data analysis, machine learning, and artificial intelligence, including regression analysis, clustering, and neural networks. Applying the acquired knowledge to analyze data and forecast trends in various fields, including agrarian economics and natural resource management

Optional Block 2. "Risk management"

Risks in agricultural production. Agricultural production risks classification. Quantitative evaluation methods of agricultural risks. Financing agricultural innovation in terms of macroeconomic instability. The innovation impact on the scale of the risk assessment. Liquidity (farms, households, businesses) and advisory function. Wood innovative solutions and riskless return in the agricultural business. Methods of risk reducing in agricultural innovation.

Models of Regional Economy. Theoretical foundations of modeling regional economy, development and analysis of macroeconomic models of the region, assessment

of the impact of different factors on the regional economy and forecasting of regional economic development. Students will acquire knowledge and skills that will help them understand the relationship between economic processes and regional development, as well as learn to use various modeling methods for analyzing and forecasting the regional economy.

Ecological and economic risks. Sustainable development conception and using opportunities for modern agricultural production development. The function of social welfare in applications to the problem of environmental management. Optimization model of environmental management. Global model biomass optimization. Comprehensive environmental and climate model to assess the potential of agriculture.

Management of Information Resources. Theoretical foundations of managing information resources, methods of information collection and processing, utilization of information technologies for enhancing business efficiency, management of technical and human resources in the field of information technologies, and much more. Students will acquire knowledge and skills that will help them understand how to effectively manage information resources in an organization, as well as learn to apply modern methods of information management to achieve success in business.

Training of masters of sciences in branch of knowledge "Information technology" in specialty 121 "SOFTWARE ENGINEERING" educational program "THE SOFTWARE OF INFORMATION SYSTEMS"

Form of training:	Licensed number of students:
– full-time	25
Duration of Training:	
– full-time educational and professional program	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of teaching	Ukrainian
Qualification of graduates	Software engineer MSc in Software Engineering

The concept of training

The main focus of this program is to provide high-quality training for highly qualified information technology and software (software) professionals who are able to solve complex and non-standard applied, scientific and innovative problems in the field of software engineering. The program aims to develop in the future specialist the ability to combine general and professional knowledge, skills, communication skills, autonomous activity and responsibility.

Educational and professional program of master's training

The educational program is focused on mastering modern approaches and technologies of software design, development and quality control. Students will have problem-oriented lectures, project decisions implementation (individual and team) at practical and laboratory classes. The program's content takes into account the life-science orientation of the university, as well as the modern information technologies in the agrarian and environmental spheres are hardly impornant for Ukraine.

Areas of employment for graduates

Future specialists will work in IT industry and perform software development and support. The graduates will mainly occupy such positions, as (according to the "State Classifier of Work Positions"): software developer; software engineer; software quality control engineer (QA); information systems architect; data analyst; researcher; mentor of IT courses and trainings etc.

Practical Training

We provide interactive trainings in close collaboration with lecturers and academic group. We are always trying to perform active discussions with lecturers during lectures, laboratory and practical classes. Some courses includes complex project, which requires team work on design research and development. The defense of the master's study is public. Students have the opportunity to participate in research projects and conferences.

Proposed Topics of Master's qualification Thesis

1. Software for intelligent systems of classification of a vegetation state according to average resolution satellite data.
2. Software for agricultural accounting information system.

3. Software for the system land pollution state estimation n the basis of geospatial data.
4. Google Earth based monitoring system software.
5. Software for monitoring the condition of crops with a mobile client.
6. Small business decision support system software (for different areas).
7. Software of technological process control system of agrfrian enterprise with intelligent module.
8. Software for regional public transport routing system with analytical module.

Curriculum of Master's training in educational program "The Software of Information Systems" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Special math sections for programmers	4	exam
CC 2	Methodology and organization of scientific research	4	exam
Optional components of EPP			
Free choice according to the preferences of students in the list of subjects			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 3	Software project management	4	exam
CC 4	High-performance computer systems	4	exam
CC 5	Data warehousing	5	exam
CC 6	Software for embedded systems	4	exam
CC 7	The methods and information technologies for risk assessment	5	exam
CC 8	Artificial intelligence systems programming	4	exam
CC 9	Work Practice	2	test
CC 10	Internship	20	test
CC 11	Preparation and defense of Master's qualification thesis	10	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Programming methodology"			
OC 1.1	Principles of distributed and network programming	4	exam
OC 1.2	Object modeling and design for complex systems	4	exam
OC 1.3	Patterns of object-oriented design and programming	4	exam
OC 1.4	Theory of formal languages and compiling	4	exam
Optional Block 2 "Data science"			
OC 2.1	Modeling and forecasting in environmental management	4	exam
OC 2.2	Big Data technology	4	exam
OC 2.3	Data Mining technology	4	exam
OC 2.4	Web applications development	4	exam
Optional Block 3 "Intelligent systems"			
OC 3.1	Methods of expert systems building	4	exam
OC 3.2	Intellectual environmental monitoring systems	4	exam
OC 3.3	Digital signals and images processing	4	exam
Optional Block 4 "Embedded systems and Internet of Things"			
OC 4.1	Robotic management systems	4	exam
OC 4.2	Hardware and software for collecting and processing environmental information	4	exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
OC 4.3	Technologies of IoT systems designing	4	exam
OC 4.4	Protocols for data transferring in IoT systems	4	exam
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects din the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Special math sections for programmers. Additional mathematics sections required for data analysis, modeling, and applied monitoring tasks.

Methodology and organization of scientific research. This discipline is directed to aquire the formation of the modern level of scientific and information culture; the acquisition of systematic knowledge about the essence, nature, structure, patterns, and methodology of scientific research; the development of competencies necessary for the independent pursuit of scientific research and the acquisition of new knowledge, processing, and presentation of the results performed scientific work, masters preparation for professional activities. Students will get acquainted with the concepts of the quality of scientific research, scientific novelty, ethics in science, plagiarism and the principles of combating it, as well as requirements for the main types of scientific and qualification work. Particular attention is paid to the practical trainings and the ability to use a systematic approaches in planning, organizing and conducting research, in finding and processing scientific information, analyzing information sources and summarizing the obtained materials, interpreting the results of scientific research and formulating conclusions. The discipline provides the development of skills directly related to the preparation, design, and protection of master's qualification papers**.**

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Software project management. The main subject if this discipline is the obtaining the theoretical knowledge and practical skills in the methodology of software project management. Task of the discipline:to study the theoretical, methodological and organizational foundations of project management;familiarization with the: concept of the software project, its elements and their properties, classification and environment of the projects, life cycle of the software project;mastering the project structuring models and the process, familiarization with the software projects management functions; mastering the management of the main characteristics of the project; mastering the project management methods, software tools and computer technologies that are focused on project management;acquiring the skills in uasage the project management methodologies; acquisition of practical skills in solving tasks of project management for the development and use of information systems and technologies at enterprises and organizations.

High-performance computer systems. This discipline has several main subjects, they are: peculiarities of the architecture of high-performance systems, approaches to the construction and use of distributed and multiprocessor systems, the implementation of parallelism in calculations, vector data processing, and the peculiarities of the structure and operation of quantum computers are studied. Also we considerate some attention to the data security issues and the peculiarities of creating and optimizing software designed to work on high-performance systems.

Data warehousing. 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.

Software for embedded systems. This discipline studies: general principles and technical features of the development of integrated systems for controlling various equipment. In this course we considerate the necessarity of information for the construction of microprocessor control systems for specialized equipment. WE also solve some tasks of the complex embedded software creating.

The Methods and Information Technologies for Risk Assessment. This discipline carries a large amount of mathematical formulas and researches in the area of the theory of probabilities. It implies: Introduction to the complex software solutions and related economic / environmental / social risks;analysis and the correct assessment of all possible risks at different stages of software life cycles;the mathematical forecasting of possible risks and expenses with the software design and implementation;development of modern methods, approaches and instrumental solutions for risk assessment.

Artificial intelligence systems programming. This discipline concider the modern methods and models of artificial intelligence, applicable to the design and implementation of decision support systems, systems for collecting, processing and analyzing large volumes of heterogeneous information. Also this discipline implies having Python and R programming languages, at least on an average level, for the implementation of the processor for intelligent analysis and data processing.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Programming methodology"

Principles of distributed and network programming. The main aim of this course is the learning of fundamentals of designing distributed program systems (including multi-user information systems) and their implementation through the use of modern software development. Special attention is paid to the role of standards of information sharing, storing and visualization.

Object modeling and design for complex systems. Object-oriented analysis and design. Domain modelling. Object model. Iterative software development technology of complex systems using object-oriented approach.

Patterns of object-oriented design and programming. Design patterns that can be implemented in standard object-oriented languages.

Theory of formal languages and compilation. In-depth familiarization of mathematical linguistics and the theory of formal languages. Grammar, formal language classifications, regular expressions, finite automata, context-free grammars, basic algorithmic problems. Methods of translators constructing.

Optional Block 2 "Data science"

Modeling and forecasting in the field of nature management. Simulation as the method of scientific knowledge. 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 processes. Models of data visualization obtained through observation. Linear regression models. Monte Carlo Models. Types and methods of forecasting. Tools for

simulation and forecasting. Microsoft Excel and MathCad tools for simulation and forecasting.

Big Data Technologies. Big Data technologies let to handle large volumes of information accumulated by organizations and make on its basis more balanced management decisions, better understand the customers and business processes. Introduction to Big Data systems. Description of features of real-time data processing. Corresponding tools usage. The ability to expand knowledge and skills beyond the traditional databases.

Data Mining Technologies. Data Mining Technology, Data Mining techniques for classification, regression, associative rules search, clustering tasks solving. Data Mining technique usage while constructing the analytical systems.

Web applications development. Internet services. Server and client side of the Internet. Main Internet and web protocols. HTML, CSS, Java Script, AJAX. HTML extensions. Create web applications using different server-side programming languages.

Optional Block 3 "Intelligent systems"

Methods of expert systems building. Main concepts of expert systems. Knowledge bases, production subsystem. Methods of forming expert recommendations. Tools for expert systems development.

Intellectual environmental monitoring systems. The purpose of studying the discipline "Intellectual computer monitoring systems" is to format the skills in solving problems that are difficult to formalize. To provide the knowledge on assessing the status and trends in the development of information systems (monitoring); the information technologies for solving management tasks are related to the use of artificial intelligence tools and techniques; the means to develop and to use an intelligent information systems in various applied fields.

Digital signals and images processing. The main objective of this discipline is studying of modern methods and tools for processing the digital information. In particular, students will learn more about: models of signal representation, image sampling methods, reconstruction, transformation, filtering, compression, statistical processing, protection of digital content, basis of spectral analysis, etc. Applied applications, state and prospects of research in this direction are also studied.

Optional Block 4 "Embedded systems and Internet of Things"

Robotic management 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 agro-industrial complex.

Hardware and software for collecting and processing environmental information. Architecture modern distributed systems of collection and processing. Classification of sensors automatically collect environmental data. Algorithms automatically gathering and initial processing. Real time operating system. Research and programming languages. Local area network. Algorithms analytical data processing subsystem upper level. Drafting the collection and processing of environmental information.

Technologies of IoT systems designing. IoT systems general concepts and structure. Methodology of computer IoT systems designing (CS IoT). Levels of IoT design – system, operational, functional, technical. Data operation Conveyor of IoT systems.

Standards and technologies. Modern methods and technologies design of hardware and software IoT systems designing.

Protocols for data transferring in IoT systems. Data transmission protocols in IoT systems. Design of IoT-systems based on software-defined networks and research of appropriate data transmission protocols. Stack of data transmission protocols, in particular MQTT, CoAP, OpenFlow protocols. Means of automation of configuration and testing of software-defined networks.

Training of masters of sciences in branch of knowledge "Information technology" in specialty 122 "COMPUTER SCIENCE" educational program "INFORMATION MANAGING SYSTEMS AND TECHNOLOGIES"

Form of training:	Licensed number of students:
– full-time	25
Duration of Training:	
– full-time educational and professional program	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of teaching	Ukrainian
Qualification of graduates	Master of Computer Science

The concept of training

The educational program is focused on training for research and scientific-technical development in the field of designing and implementation of information systems, which are aimed at solving problems in agriculture and other fields.

Educational and professional program of master's training

The object of activity of specialists of this program is the development of algorithms; mathematical modeling; design and development of computer information technologies for data processing and research, use of mathematical statistics apparatus, artificial intelligence, machine learning, modern OLAP and Data Mining, Big Data.

Areas of employment of graduates

On their workplaces graduates can address issues related to the management and maintenance of complex information systems. In addition, they can analyze 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. Graduates can work in occupations according to the National Classifier of Occupations DK 003: 2010:

213 Calculation Professionals (Computerization)

2131 Professionals in Computer Systems

2131.1 Research assistants (computing systems)

2131.2 Computing system developers

Places of employment: educational institutions; research, design, production, state and private enterprises (specialists of IT departments or IT enterprises).

Practical training

Practical training of masters in “Information managing 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 of Master's qualification Thesis

1. Corporate knowledge database processing on the example of land cadaster: 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.

Curriculum of Master training in educational program "Information managing systems and technologies" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	About the distribution of mathematical statistics mathematical statistics	4	exam
CC 2	Methodology and organization of research on the basics of intellectual property	4	exam
Optional components of EPP			
Free choice according to the preferences of students in the list of subjects			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 3	Modelling and forecast in environmental sphere	5	exam
CC 4	Object modelling and designing of complex systems	4	exam
CC 5	Organization of data warehouse	5	exam
CC 6	Methods of expert systems	4	exam
CC 8	Big Data Technologies	4	exam
CC 9	Data Mining Technology		
CC 10	Work Practice	2	test
CC 11	Research practice	20	test
CC 12	Preparation and defense of Master's qualification thesis	10	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Computer monitoring environmental and economic processes"			
OC 1.1	Hardware and software for collecting and processing environmental information	4	exam
OC 1.2	Robot-technic Systems of Management	4	exam
OC 1.3	Intellectual environmental monitoring systems	4	exam
Optional Block 2 "Special Information Systems Software"			
OC 2.1	High-performance computer systems	4	exam
OC 2.2	Software for embedded systems	4	exam
OC 2.3	Principles of distributed and network programming	4	exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
OC 2.4	Programming of Artificial Intelligence Systems	4	exam
Optional Block 3 "Internet of Things"			
OC 3.1	Technologies of IOT systems designing	4	exam
OC 3.2	Protocols for data transferring in IOT systems	4	exam
Optional Block 4 "Techniques of information systems development"			
OC 4.1	Development of WEB applications	4	exam
OC 4.2	Patterns of object-oriented design and programming	4	exam
OC 4.3	Information systems management	4	exam
OC 4.4	Safety and reliability of computer systems	4	exam
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

About the distribution of mathematical statistics mathematical statistics Studying the course of mathematical statistics gives future professionals theoretical knowledge and practical skills in the application of mathematical methods for learning the laws of random events, analysis of mass economic, social and information processes. Knowledge of these laws makes it possible to predict the development of processes in any scientific field and make analysis of the results in the agricultural industry and business.

Methodology and organization of research on the basics of intellectual property. The organizational structure of the scientific team. Planning of research. Conducting research and experimental design in the research work. Intellectual Property Law as the results of human creativity. Intellectual property. State System of Intellectual Property. The international intellectual property system. Protection of intellectual property. The right to intellectual property as an investment and goods. Valuation of intellectual property. Protection of intellectual property rights.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Modelling and forecast in environmental sphere. Simulation as the method of scientific knowledge. 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 processes. Models of data visualization obtained through observation. Linear regression models. Monte Carlo Models. Types and methods of forecasting. Tools for simulation and forecasting. Microsoft Excel and MathCad tools for simulation and forecasting.

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.

Organization of data warehouse. 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.

Methods of expert 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.

Big Data Technologies. Big Data technologies let to handle large volumes of information accumulated by organizations and make on its basis more balanced management decisions, better understand the customers and business processes. Introduction to Big Data systems. Description of features of real-time data processing. Corresponding tools usage. The ability to expand knowledge and skills beyond the traditional databases.

Data Mining Technologies. Data Mining Technology, Data Mining techniques for classification, regression, associative rules search, clustering tasks solving. Data Mining technique usage while constructing the analytical systems.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Computer monitoring environmental and economic processes"

Hardware and software for collecting and processing environmental information Architecture modern distributed systems of collection and processing. Classification of sensors automatically collect environmental data. Algorithms automatically gathering and initial processing. Real time operating system. Research and programming languages. Local area network. Algorithms analytical data processing subsystem upper level. Drafting the collection and processing of environmental information.

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.

Intellectual environmental monitoring systems. The purpose of studying the discipline "Intellectual computer monitoring systems" is to format the skills in solving problems that are difficult to formalize. To provide the knowledge on assessing the status and trends in the development of information systems (monitoring); the information technologies for solving management tasks are related to the use of artificial intelligence tools and techniques; the means to develop and to use an intelligent information systems in various applied fields.

Optional Block 2 "Special Information Systems Software"

High-performance computer systems. This discipline has several main subjects, they are: peculiarities of the architecture of high-performance systems, approaches to the construction and use of distributed and multiprocessor systems, the implementation of parallelism in calculations, vector data processing, and the peculiarities of the structure and operation of quantum computers are studied. Also, we considerate some attention to the data security issues and the peculiarities of creating and optimizing software designed to work on high-performance systems.

Software for embedded systems. This discipline studies: general principles and technical features of the development of integrated systems for controlling various equipment. In this course we considerate the necessity of information for the construction

of microprocessor control systems for specialized equipment. WE also solve some tasks of the complex embedded software creating.

Principles of distributed and network programming. The main aim of this course is the learning of fundamentals of designing distributed program systems (including multi-user information systems) and their implementation through the use of modern software development. Special attention is paid to the role of standards of information sharing, storing and visualization.

Programming of Artificial Intelligence Systems. This discipline considers the modern methods and models of artificial intelligence, applicable to the design and implementation of decision support systems, systems for collecting, processing, and analyzing large volumes of heterogeneous information. Also, this discipline implies having Python and R programming languages, at least on an average level, for the implementation of the processor for intelligent analysis and data processing.

Optional Block 3 "Internet of Things"

Technologies of IOT systems designing. IOT systems general concepts and structure. Methodology of computer IoT systems designing (CS IoT). Levels of IoT design – system, operational, functional, technical. Data operation Conveyor of IoT systems. Standards and technologies. Modern methods and technologies design of hardware and software IoT systems designing.

Protocols for data transferring in IOT systems. Data transmission protocols in IoT systems. Design of IoT-systems based on software-defined networks and research of appropriate data transmission protocols. Stack of data transmission protocols, in particular MQTT, CoAP, OpenFlow protocols. Means of automation of configuration and testing of software-defined networks.

Optional Block 4 “Techniques of information systems development”

Development of WEB applications. 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.

Patterns of object-oriented design and programming. Design patterns that can be implemented in standard object-oriented languages.

Information systems management. 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

Safety and reliability of computer systems. Elements of reliability theory. The basic definition of reliability and their contents. Methods of ensuring reliability. Reliability and control devices of computer systems. Information redundancy as a panacea control. Ensuring reliability computing processes.

Training of Master of Sciences
in branch of knowledge "Information technology"
in specialty 122 "COMPUTER SCIENCE"
educational program "COMPUTER ECOLOGICAL AND ECONOMIC MONITORING"

Form of training:	Licensed number of students:
– full-time	15
Duration of Training:	
– full-time educational and professional program	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of teaching	Ukrainian
Qualification of graduates	Master of Computer Science

The concept of training

Specialists in computer ecological and economic monitoring are professionals in information systems. They can assess the environmental effects of large-scale research, development and technology programs; perform an economic assessment of investment in environmental security projects using computer technology; create and exploit geographic information systems using modern software and hardware; accumulate and process interacting flows of GIS data from various monitoring models.

Educational and professional program of master's training

The concept of the master's program consists of trained professionals with the skills of design, development and implementation of information systems for environmental monitoring with the help of modern technology of collaborative development; programming, testing, protection and operation of information systems; use technologies and methods of system analysis and decision-making in the creation of large and complex systems; operation of artificial intelligence and automated software. Graduates of this master's program will be knowledgeable in the methods of previous research of subject area for the construction of ecological-economic models of objects and systems; in the representation and processing of information in the form of environmental and economic systems; in solving environmental and economic problems with the help of special algorithms for the effective decision of problems; in the development and implementation of mechanisms for efficient processing of very large scale databases of the environmental and economic purposes.

Areas of employment of graduates

Graduates of master’s program can work managers in the field of ecological and economic monitoring; developers of software and hardware for creating ecological and economic models at different levels; database administrators; experts on environmental impact assessment and certification of enterprises of all activities (energy, petroleum, chemical, metallurgy, agriculture, food, etc.). Graduates can work in occupations according to the National Classifier of Occupations DK 003: 2010:

213 Calculation Professionals (Computerization)

2131 Professionals in Computer Systems

2131.1 Research assistants (computing systems)

2131.2 Computing system developers

Places of employment: educational institutions; research, design, production, state and private enterprises (specialists of IT departments or IT enterprises).

Practical training

Practical training for masters aimed at learning the basic methods techniques of research production problems according to the educational program “Computer Ecological and Economic Monitoring”, to the general issues of construction and operation of monitoring systems according to environmental parameter, to the assess the necessary information systems, to the analytical, optimization and forecasting developments based on information system for monitoring and calculation of the expected economic effects of external factors on the environmental consequences.

Proposed Topics of Master's qualification Thesis

1. Evaluation of agricultural crops based on ground measurements and statistical approach.
2. Predictive models yield of spring crops based on data fusion techniques.
3. Ensemble approach to classification of land cover.
4. Evaluation acreage of winter wheat based on ground and remote measurements.
5. Evaluation of agricultural risks based on a statistical approach.
6. Drought risk assessment by the largest likelihood.
7. Simulation of humus content in the soil by ground and remote sensing.
8. Evaluation of forest areas based on geospatial intelligence.
9. Models cascade for estimating moisture content in vegetation.
10. The methods of data fusion to assess biodiversity.

Curriculum of Master’s training in educational program "Computer ecological and economic monitoring" (educational and professional program of master’s training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	About the distribution of mathematical statistics mathematical statistics	4	exam
CC 2	Methodology and organization of research on the basics of intellectual property	4	exam
Optional components of EPP			
Free choice according to the preferences of students in the list of subjects			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 3	Modelling and forecast in environmental sphere	5	exam
CC 4	RS and technology processing geospatial data	4	exam
CC 5	Hardware and software for collecting and processing environmental information	4	exam
CC 6	Object modelling and designing of complex systems	4	exam
CC 7	Organization of data warehouse	5	exam
CC 8	DataMining Technology	4	exam
CC 9	Work Practice	2	test
CC 10	Research practice	20	test
CC 11	Preparation and defense of Master's qualification thesis	10	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Computer monitoring environmental and economic processes"			
OC 1.1	Intellectual environmental monitoring systems	4	exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
OC 1.2	Robot-technic Systems of Management	4	exam
OC 1.3	IT monitoring of environmental and socio-economic processes	4	exam
OC 1.4	Simulation modeling of environmental processes	4	exam
Optional Block 2 "Special Information Systems Software"			
OC 2.1	High-performance computer systems	4	exam
OC 2.2	Software for embedded systems	4	exam
OC 2.3	Programming of Artificial Intelligence Systems	4	exam
Optional Block 3 "Internet of Things"			
OC 3.1	Technologies of IOT systems designing	4	exam
OC 3.2	Protocols for data transferring in IOT systems	4	exam
Optional Block 4 " Techniques of information systems development "			
OC 4.1	Development of WEB applications	4	exam
OC 4.2	Patterns of object-oriented design and programming	4	exam
OC 4.3	Information systems management	4	exam
OC 4.4	Safety and reliability of computer systems	4	exam
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

About the distribution of mathematical statistics mathematical statistics Studying the course of mathematical statistics gives future professionals theoretical knowledge and practical skills in the application of mathematical methods for learning the laws of random events, analysis of mass economic, social and information processes. Knowledge of these laws makes it possible to predict the development of processes in any scientific field and make analysis of the results in the agricultural industry and business.

Methodology and organization of research on the basics of intellectual property. The organizational structure of the scientific team. Planning of research. Conducting research and experimental design in the research work. Intellectual Property Law as the results of human creativity. Intellectual property. State System of Intellectual Property. The international intellectual property system. Protection of intellectual property. The right to intellectual property as an investment and goods. Valuation of intellectual property. Protection of intellectual property rights.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

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.

RS and technology processing geospatial data. The general concept of remote sensing. Electromagnetic radiation. Classification of remote sensing methods. Sensory systems and remote sensing sensors. Descramble object characteristics. Getting remote sensing data. Data Formats. Standardization in the field of remote sensing. Preliminary processing of remote sensing data. Geo-referenced images and transformation. image Classification.

Hardware and software for collecting and processing environmental information Architecture modern distributed systems of collection and processing.

Classification of sensors automatically collect environmental data. Algorithms automatically gathering and initial processing. Real time operating system. Research and programming languages. Local area network. Algorithms analytical data processing subsystem upper level. Drafting the collection and processing of environmental information.

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.

Organization of data warehouse. 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.

Data Mining Technologies. Data Mining Technology, Data Mining techniques for classification, regression, associative rules search, clustering tasks solving. Data Mining technique usage while constructing the analytical systems.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Computer monitoring environmental and economic processes"

Intellectual environmental monitoring systems. The purpose of studying the discipline "Intellectual computer monitoring systems" is to format the skills in solving problems that are difficult to formalize. To provide the knowledge on assessing the status and trends in the development of information systems (monitoring); the information technologies for solving management tasks are related to the use of artificial intelligence tools and techniques; the means to develop and to use an intelligent information systems in various applied fields.

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.

IT monitoring of environmental and socio-economic processes. Objectives, targets, legal and regulatory framework of EE monitoring. Compilation of information model observation. Analysis IT network monitoring. Equipment and operation of information systems for monitoring applications. Software and network tools and platform information technology infrastructure businesses. Geographic information systems and technology monitoring of space distributed objects and processes. Management of monitoring data. IT and GIS of spatial analysis and modeling of performance monitoring of ESEP. Models of the structure and relationship of events and dynamics of ESEP. Bold space-time anomalies of ESEP. Assessment of the object of observation and identification of its information model. Forecasting changes in the state of the object. Standards information interaction systems. Integration of IT monitoring of ESEP.

Simulation modeling of environmental processes. IT simulation. Discrete and continuous random variables in models of ecological processes. Imitation modeling of man-made and natural disasters. The assessment of the genetic inheritance of dominant and recessive traits for future generations of organisms. Modeling language (GPSS, SIMULA).

Optional Block 2 "Special Information Systems Software"

High-performance computer systems. This discipline has several main subjects, they are: peculiarities of the architecture of high-performance systems, approaches to the construction and use of distributed and multiprocessor systems, the implementation of parallelism in calculations, vector data processing, and the peculiarities of the structure and operation of quantum computers are studied. Also, we considerate some attention to the data security issues and the peculiarities of creating and optimizing software designed to work on high-performance systems.

Software for embedded systems. This discipline studies: general principles and technical features of the development of integrated systems for controlling various equipment. In this course we considerate the necessity of information for the construction of microprocessor control systems for specialized equipment. WE also solve some tasks of the complex embedded software creating.

Programming of Artificial Intelligence Systems. This discipline considers the modern methods and models of artificial intelligence, applicable to the design and implementation of decision support systems, systems for collecting, processing, and analyzing large volumes of heterogeneous information. Also, this discipline implies having Python and R programming languages, at least on an average level, for the implementation of the processor for intelligent analysis and data processing.

Optional Block 3 "Internet of Things"

Technologies of IOT systems designing. IOT systems general concepts and structure. Methodology of computer IoT systems designing (CS IoT). Levels of IoT design – system, operational, functional, technical. Data operation Conveyor of IoT systems. Standards and technologies. Modern methods and technologies design of hardware and software IoT systems designing.

Protocols for data transferring in IOT systems. Data transmission protocols in IoT systems. Design of IoT-systems based on software-defined networks and research of appropriate data transmission protocols. Stack of data transmission protocols, in particular MQTT, CoAP, OpenFlow protocols. Means of automation of configuration and testing of software-defined networks.

Optional Block 4 “Techniques of information systems development”

Development of WEB applications. 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.

Patterns of object-oriented design and programming. Design patterns that can be implemented in standard object-oriented languages.

Information systems management. 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.

Safety and reliability of computer systems. Elements of reliability theory. The basic definition of reliability and their contents. Methods of ensuring reliability. Reliability and control devices of computer systems. Information redundancy as a panacea control. Ensuring reliability computing processes.

Training of masters of sciences in branch of knowledge "Information technologies" in specialty 123 "COMPUTER ENGINEERING" educational program "COMPUTER SYSTEMS AND NETWORKS"

Form of Training:	Licensed number of persons:
– Full-time	25
Duration of Training:	
– Full-time educational and professional program	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian
in Computer Engineering	Master in Computer Engineering

The concept of training

The training of masters in this educational program is aimed at implementing production and technical, technological, organizational and management, design, research and educational activities in the field of the creation and operation of computer systems and networks hardware and software.

Educational and professional program of masters training

The purpose of the educational and professional program is to train qualified, competitive specialists for research, design and technological, organizational and management activities in the field of computer systems and networks design and operation. Educational program provides the formation of a future specialist ability to dynamically combine knowledge, skills, communication skills and abilities with autonomous activity and responsibility in solving problems in the field of computer engineering for the development and study of hardware and software for computer systems and networks.

In the field of educational activity, the main goal is to develop future professional in terms of the following skills: world-view orientation and a broad outlook in the social, humanitarian, fundamental and professional fields.

In the field of professional activity, the training of masters is associated with acquiring the ability to complete a full range of system work on the development of hardware and software, starting with the conceptual development of the project and its implementation, and ending with user support in the process of already implemented computer system operation.

Training of masters in computer systems and networks in the field of technical means of computer technology allows a professional to design and develop universal and specialized computers at the level of individual units and devices, as well as at the structural and system level microcontroller devices, controllers, adapters, computer networks. In the field of programming and software, the training of masters allows to work as a professional both as a full-stack and a system programmer and to independently develop and use system software and utilities, in particular, to develop and use the drivers, user utilities, operating system components, information systems, databases, computer graphics, automated design systems, interactive systems, artificial intelligence systems, embedded programs for specialized computing systems.

Areas of employment of graduates

Graduate can analyze the problem area at the systemic and structural levels of design and resolve the tasks dealing with the development and maintenance of both individual subsystems and the whole complex of universal and specialized computer systems. According to the State Classifier of Professions, graduates of this educational program can work in the following positions: computer systems analyst, computer systems engineer, computer systems designer, computer programmer, system programmer, network administrator, etc.

Future specialists can work in the IT industry by performing the development and maintenance of hardware and software of information security systems, hold primary positions (according to the "State Classifier of Professions"): an analyst of computer systems, an engineer of computer systems, computer systems designer, programmer engineer, system programmer, system administrator, network administrator, etc.

Practical training

Practical training of students in this specialty is aimed at mastering the main methods of designing, technologies of development and maintenance of hardware and software of specialized computer systems and information security subsystems of such systems.

Proposed Topics of Master's qualification Thesis

1. Hardware and software means of information protection in computer systems.
2. Specialized function-oriented computer system for specific problems resolving in a particular problem domain.
3. Development of system software of computer systems.
4. Development of hardware and software facilities for information protection in computer networks.
5. Intelligent computer system for the environment state control.
6. Microcontroller system for agricultural objects monitoring and control.
7. Specialized control system for technological processes of agro-industrial enterprise control.
8. Development of network applications for specialized computer systems.
9. Research on the access control computer system to the room based on microcontrollers.
10. Research on face recognition system using computer vision based on IP-camera.

Curriculum of Master's training in educational program "Computer systems and networks" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC1	Foreign language (for professional purposes)	4	exam
CC2	Research methodology with the basics of intellectual property	4	exam
Optional components of EPP			
Free choice according to the preferences of students in the list of subjects			
OCP 1	Choice from the catalog 1	4	test

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC3	Theory and design of computer systems and networks	4	exam
CC4	Computer systems programming technologies	4	exam
CC5	Technologies for constructing secure computer systems	10	exam
CC6	Visualization and pattern recognition systems	4	exam
CC7	Intellectual data analysis	4	exam
CC8	Internship	2	credit
CC9	Research practice	20	credit
CC10	Preparation and defense of Master's qualification Thesis	10	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Internet of Things"			
OC 1.1	Robotic operating systems	4	exam
OC 1.2	Technologies of the IOT systems designing	4	exam
OC 1.3	Data transmission protocols of the IOT systems	4	exam
OC 1.4	Information technologies for monitoring and simulation of the environment	4	exam
OC 1.5	Computer systems of artificial intelligence	4	exam
Optional Block 2 "Computer systems and networks protection technologies"			
OC 2.1	Administration and protection of databases and data warehouses	4	exam
OC 2.2	Computer methods of analysis and design of information security electronic means	4	exam
OC 2.3	Complex systems for authorized access to information	4	exam
OC 2.4	Technologies of administration and operation of protected information and communication systems	4	exam
OC 2.5	Artificial intelligence systems in the tasks of information protection	4	exam
Optional Block 3 "Computer Systems Software"			
OC 3.1	Methods of expert systems construction	4	exam
OC 3.2	Web Application Development	4	exam
OC 3.3	Hardware and software tools for ecological information collection and processing	4	exam
OC 3.4	Intelligent environmental monitoring systems	4	exam
OC 3.5	Robotic control systems	4	exam
OC 3.6	Management of information services	4	exam
OC 3.7	Programming of Artificial Intelligence Systems.	4	exam
OC 3.8	High-performance computer systems	4	exam
OC 3.9	Digital signal and image processing	4	exam
OC 3.10	Embedded systems Software	4	exam
Optional Block 4 "Data Analysis in Computer Systems"			
OC 4.1	Modeling and forecasting in the field of nature management	4	exam
OC 4.2	Big Data technologies	4	exam
OC 4.3	Data Mining Technologies	4	exam
OC 4.4	Modeling with R	4	exam
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Foreign language (for professional purposes). Foreign language scientific text. Formulation and generalization of scientific tasks. Translation and generalization of the main results of observation or experiment.

Genres of foreign language scientific text.

Terminological glossary by profession. Preparation of annotation for a master's thesis in a foreign language. Annotation composition, lexical and phraseological clichés, grammatical register of annotation. Types of annotations.

Culture of foreign language professional communication.

Presentation and exchange of scientific information. Discussion of professional and academic issues. Work with professional literature and documentation.

Research methodology with the basics of intellectual property. Organizational structure of the scientific team. Planning of the research. Research conduction and experimental design in the research work. Intellectual Property Law as the results of human creativity. Intellectual property. State System of Intellectual Property. The international intellectual property system. The right of intellectual property as an investment and goods. Evaluation of intellectual property. Protection of intellectual property rights.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Theory and design of computer systems. System and functional design of computer systems (CS). Technical design of the CS. Methods and algorithms of routing in the CS. Designing of hardware, analysis, justification and choice of CS main components. Designing of I/O subsystems. Converters of information in computer systems. Designing of real-time CS software. Methods of structural analysis and synthesis of computer networks (CN) in real-time CS. Methodology of CN designing. Organization of information exchange in the CS. Processes planning. Simulation of real-time computer information systems. Optimization of information flows in the CN.

Computer systems programming technologies. Fundamental concepts of programming technology. Software Development Life Cycle Standards. Programming methods. Modern software development models. Software design tools. Variety of environments to solve the problems of software components interaction. Methods of specification of programs, interfaces and systems. Object-Oriented Visual Programming. Data classes. CASE-tools for the structured approach to software design support. The technology of the implementation of CASE-tools. Data abstraction tools. Classes that depend on the state. Classes that hide algorithms. User interface classes.

Technologies for constructing secure computer systems. Fundamentals of information protection. The task of information protection. The procedure of work on information protection carrying out. Classification of methods and means of information protection. Channels of unauthorized information obtainment. The notion of unauthorized information obtainment channel. The methods of information identification. Interception of information in communication lines. Methods of information destruction. Software methods of information destruction. Technical methods and means of information protection. Cryptographic protection of information. Software information protection methods.

Visualization and pattern recognition systems. Visualization system (VS) conceptual model. General principles of image synthesis in computer systems, hardware and software visualization systems. High-level language instrumental means for displaying

images and graphic al objects basic classes. Classification systems and features of image input and imaging tools. Graphical Data Descriptive Standards. Coordinate systems conveyor of VS. Geometrical models and transformations, algorithmic and instrumental means of 3D graphic. Principles of working with color images. Basic concepts of the pattern recognition theory. Conveyor of pattern recognition systems. Image enhancement tasks and corresponding features, image filtering. Binarization and image preparation problems. Methods of pattern recognition.

Intellectual data analysis. Fundamentals of data mining. Methods of initial data processing. Data structure research methods: visualization and automatic data grouping. The tasks of decision support systems. Databases. OLTP systems for data analysis. Concepts and organization of data warehousing. Correlation and regression analysis of data. Multiple regression analysis. Cluster analysis. Hierarchical and sectional clustering. Methods of clusterization. Raster clustering of objects. Linear discriminatory analysis. Construction of canonical and classification functions. Methods of forecasting.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Internet of Things"

Robotic operating systems. Basic concepts and designations of robotic operating systems (ROS). ROS architecture. Standard and specialized ROS functions. Standard ROS services. User Packages ROS-pkg.

Technologies of the IoT systems designing. IoT systems general concepts and structure. Methodology of computer IoT systems designing (CS IoT). Levels of the IoT design – system, operational, functional, technical. Data operation Conveyor of the IoT systems. Standards and technologies. Modern methods and technologies of hardware and software tools of the IoT systems designing.

Data transmission protocols of the IoT systems. Designing of the IoT-systems based on software-defined networks and study of appropriate data transmission protocols. Stack of data transmission protocols, e.g., MQTT, CoAP, OpenFlow protocols. Tools for automation of configuration and testing of software-defined networks.

Information technologies for monitoring and simulation of the environment. Tasks of ecological monitoring information systems. Classification of monitoring systems. Types of environmental observations and research. Analytical and statistical methods of monitoring results analysis. The concept of a mathematical model. Fundamental principles and techniques of mathematical modelling. Technology of mathematical modelling. Population models. Statistical modelling in ecology. Regression models. Smallest squares method. Composite method of ecosystem modelling. Approaches to mathematical modelling of urban ecosystems. Development and study of mathematical models of biotechnical and agricultural production objects on the basis of computer technologies.

Computer systems of artificial intelligence. The concept of artificial intelligence. The concept of smart and intelligent problem. Methods of intellectual tasks representation and methods of search for a solution. Knowledge and knowledge representation models in systems of artificial intelligence (SAI). Semantic grids (SG): basic concepts, types, methods, of description and inference to the SG. Frames: basic concepts, frame structure. Frame systems. Expert Systems (EC): purpose and principles of the construction; generalized architecture, classes of problems that are solved by EC. Modern software tools and instruments for SAI creation: Visual Prolog. Allegro CLOS, CLIPS, JESS. Introduction to functional and logic programming.

Optional Block 2 "Computer systems and networks protection technologies"

Administration and protection of databases and data warehouses. Administration technologies and exploitation of protected information-communication systems, oriented on distributed data processing. Organization of databases and warehouses. Database administration functions. Secrecy provision. Data integrity protection. Protection against unauthorized access. Database recovery.

Computer methods of analysis and design of information security electronic means. Methods and technologies of automated designing and study of electronic means and information security systems. Technical means and equipment for unauthorized access to information. Ways of development of means and methods for information obtainment. Classification of technical means of information exchange. Technical methods and means of information protection.

Complex systems for authorized access to information. Protection against unauthorized access. Normative legal support for information security. Distribution of security services by levels of ISO/OSI model. Criteria CS protection. Development of security profile. ISO-7498-2 standard. Organization of authorized access at enterprises of any form of ownership. Fundamentals of complex system of authorized access development. Automated access control systems.

Technologies of administration and operation of protected information and communication systems. Methods and means of local networks protection when connected to public networks. Types of authentication: static, stable, permanent. Classification of identification and authentication systems. Authentication of users. Symmetric and asymmetric methods for subject authentication. Vulnerabilities of one-time passwords technology. User tools for biometric data. Benefits and methods of biometric identification.

Artificial intelligence systems in the tasks of information protection. General theoretical approaches to the ways of intellectualized systems of informational security designing and usage. Knowledge forming and withdrawal. Knowledge representation and the conclusions in the expert systems. Model of knowledge representation by way of first-order logic instruments application. Knowledge representation with productive rules. Forming the concept of artificial intelligence creation in the tasks of information protection. The technology of the expert system development. Fuzzy knowledge representation in the expert systems. Stanford algebra. Dempster-Shafer theory.

Optional Block 3 "Computer Systems Software"

Methods of expert systems construction. 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.

Web Applications Development. Fundamental concepts of end-to-end application creation in the web-environment. The HTML, JAVASCRIPT, PHP languages. Creation of dynamic web-sites. Basic concepts of information and its presentation in web-environment. Principles of databases usage in web-environment, the possibility of web-sites creation by using a variety of software tools and its combinations.

Hardware and software tools for ecological information collection and processing. Architecture of modern distributed systems for information collection and processing. Classification of sensors for automatic collection of environmental data. Algorithms for automatic data collection and initial processing. Real time operating system. Research and programming languages. Local computing networks. Algorithms for analytical data processing in upper-level subsystem. Designing the system for ecological information collection and processing.

Intellectual environmental monitoring systems. The purpose of studying the discipline is to form the skills in solving the problems that are difficult to formalize. Provide the knowledge on assessing the status and trends in the development of information systems (monitoring); information technologies for managerial tasks solving, related to the use of artificial intelligence tools and techniques; the means for intelligent information systems development and usage in various applicability domains.

Robotic control systems. Purpose, classification and problems of robot control systems. Structure, basic components of robotic control systems. Intelligent robotic systems. The system of perception and recognition of information. The system of knowledge management, problem solving and management actions formation. The system of environmental impact. The principles of robots and robotic systems construction. System technological design of robotic control systems. Applications of robots and robotic systems in the agro-industrial complex.

Management of information services. Organizational structure of the IT service, departments structure, distribution of functions and tasks between the departments. Process approach to IC service management. The ITSM model, developed within the ITIL project (IT Infrastructure Library) and describes the process approach to the provision and support of IT services. Hewlett-Packard Information Systems Management Solutions. ITSM Reference Model. IBM Information Systems Management Solutions. ITPM information process model. Basic IBM / Tivoli technologies. Microsoft's approach to manageable information systems building. Microsoft Solutions for Management - MSM.

Programming of Artificial Intelligence Systems. This discipline covers the modern methods and models of artificial intelligence, applicable to the design and implementation of decision support systems, systems for large volumes of heterogeneous information collecting, processing and analysis. Also this discipline implies the knowledge of Python and R programming languages, at least on medium level, – to implement the processors for intellectual analysis and data processing.

High-performance computer systems. This discipline has several main subjects: peculiarities of the architecture of high-performance systems, approaches to the construction and use of distributed and multiprocessor systems, implementation of parallelism in calculations, vector data processing, and the peculiarities of the structure and operation of quantum computers are studied. Data security issues are also covered. The peculiarities of software for high-performance systems creation and optimization are also considered.

Digital signal and image processing. The main objective of this discipline is to study the modern methods and tools for processing the digital information. In particular, students will learn more about the following: models of signal representation, image sampling methods, reconstruction, transformation, filtering, compression, statistical processing, protection of digital content, fundamentals of spectral analysis, etc. Applied implementations, state and prospects of research in this direction are also studied.

Embedded systems Software. Discipline covers the following topics: general principles and technical features of the development of integrated systems for controlling various equipment. In this course we consider the necessary information for the construction of microprocessor control systems for specialized equipment. The task of embedded systems software is complex, requiring the developer to be proficient in various areas of hardware and software engineering.

Optional Block 4 "Data Analysis in Computer Systems"

Modeling and forecasting in the field of nature management. Simulation as the method of scientific knowledge. 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 processes. Models of data visualization obtained through observation. Linear regression models. Monte Carlo Models. Types and methods of forecasting. Tools for simulation and forecasting. Microsoft Excel and MathCad tools for simulation and forecasting.

Big Data Technologies. Big Data technologies let to handle large volumes of information accumulated by organizations and make on its basis more balanced management decisions, better understand the customers and business processes. Introduction to Big Data systems. Description of features of real-time data processing. Corresponding tools usage. The ability to expand knowledge and skills beyond the traditional databases.

Data Mining Technologies. Data Mining Technology, Data Mining techniques for classification, regression, associative rules search, clustering tasks solving. Data Mining technique usage while constructing the analytical systems.

Modeling with R. R language essentials. The R environment. Probability and distributions. Simple linear regression. Residuals and fitted values. Prediction and confidence bands. Correlation. Multiple regression. Model specification and output. Search model. Linear models. Nonlinear curve fitting. Self-starting models.

FACULTY OF CONSTRUCTION AND DESIGN

Dean – Ph.D. (Technical Sciences), associate professor Zynoviy Ruzhylo
Tel.: +38 (044) 527-81-29
E-mail: design_dean@nubip.edu.ua
Location: building № 11, room 305

The faculty organizes and coordinates the educational process of preparation of masters for educational programs in the specialty:

Specialty 133 "Mecanical engineering"

Educational program "Machinery and equipment of agricultural production"

Guarantor of the educational-professional program - Doctor of Technical Sciences, Prof. Yuriy Oleksandrovych Romasevych

Guarantor of the educational and scientific program - Doctor of Technical Sciences, Prof. Vyacheslav Sergeevich Loveikin

Diploma Departments:

Constructing of Machines and equipment

Тел.: (044) 527-87-34

E-mail: machinebuild_centre@twin.nauu.kiev.ua

Head of department – Doctor of Technical Sciences, professor Vyacheslav Loveykin

Reliability of machinery

Tel.: +38 (044) 527-87-71

E-mail: novitskiyAV@ukr.net

Head of department – Ph.D. (Technical Sciences), associate professor Andriy Novitskiy

Educational program "Forest Complex Equipment"

Guarantor of educational and professional program - Candidate of Technical Sciences, Associate Professor Oleksandr Bannyi

Diploma Departments:

Constructing of Machines and equipment

Тел.: (044) 527-87-34

E-mail: machinebuild_centre@twin.nauu.kiev.ua

Head of department – Doctor of Technical Sciences, professor Vyacheslav Loveykin

Reliability of machinery

Tel.: +38 (044) 527-87-71

E-mail: novitskiyAV@ukr.net

Head of department – Ph.D. (Technical Sciences), associate professor Andriy Novitskiy

Educational program "Technical service of machines and equipment of Agricultural Production"

Guarantor of the educational and professional program - Ph.D. (Technical Sciences), associate Professor Andriy Valentynovych Novytsky

Diploma Departments:

Reliability of machinery

Tel.: +38 (044) 527-87-71

E-mail: novitskiyAV@ukr.net

Head of department – Ph.D. (Technical Sciences), associate professor Andriy Novitskiy

Constructing of Machines and equipment

Tel.: +38 (044) 527-87-34,

E-mail: machinebuild_centre@twin.nauu.kiev.ua

Head of department – Doctor of Technical Sciences, professor Vyacheslav Loveykin

Educational program "Robotic systems and complexes of agricultural production"

The guarantor of the educational and professional program - PhD, senior lecturer Viktor Krushelnytskyi

Diploma Department:

Constructing of Machines and equipment

Tel.: +38 (044) 527-87-34,

E-mail: machinebuild_centre@twin.nauu.kiev.ua

Head of department – Doctor of Technical Sciences, professor Vyacheslav Loveykin

Specialty 192 "Industrial and Civil Engineering"

Educational program "Construction and civil engineering"

Guarantor of the educational-professional program - Ph.D. (Technical Sciences), associate professor Bakulin Evgeniy Anatoliyovych

Guarantor of the educational and scientific program - Doctor of Technical Sciences, senior lecturer Fesenko Oleh Anatoliiovych

Diploma Departments:

Construction

Tel.: +38 (044) 527-83-92

E-mail: bakulin959@ukr.net

Head of department – Ph.D. (Technical Sciences), associate professor Evgeniy Bakulin

Mechanics

Tel.: +38 (044) 527-83-25

Email: bulgakov@nubip.edu.ua

The head of the department is Doctor of Technical Sciences, Professor Volodymyr Mykhailovych Bulgakov

Training of masters of sciences in branch of knowledge "Mechanical engineering" in specialty 133 "MECHANICAL ENGINEERING" educational program "MACHINERY AND EQUIPMENT OF AGRICULTURAL PRODUCTION"

Type of studying:	Licensed persons::
– full-time studying	50
– part-time studying	50
Duration of studying:	
- full-time educational-professional program	1 years 4 months
- full-time educational-research program	1 years 10 months
– part-time program	1 years 4 months
Credits:	
– educational-professional program	90
– educational-research program	120
Language	Ukrainian, English
Academic degree	Master of Mechanical Engineering

Concept of training

Training of masters in specialty 133 " Mechanical engineering", the educational program "Machinery and equipment of agricultural production" is based on the systematic approach of mastering special skills and knowledge sufficient for the fulfillment of professional tasks and responsibilities of an innovative nature in the field of construction, design, testing, certification, maintenance and utilization of machinery and equipment for agricultural production..

The specialist gets deep knowledge of the design, engineering and testing of agricultural machinery based on the theory of technical systems, a clear understanding of the stages of system evaluation and testing methods of agricultural machines in accordance with sectoral, national and international standards. The engineering of machines is realized through formation, structuring and solution of optimization problems of analysis and synthesis of agricultural machines.

Educational-professional program of master's training

The specialist gets deep knowledge of the design, engineering and testing of agricultural machinery based on the theory of technical systems, a clear understanding of the stages of system evaluation and testing methods of agricultural machines in accordance with sectoral, national and international standards. The engineering of machines is realized through formation, structuring and solution of optimization problems of analysis and synthesis of agricultural machines.

Areas of employment of graduates

Graduates with the qualification "engineer-designer" are able to perform professional tasks and responsibilities of an innovative nature, provided in the form of economic activity, primary positions in the group of professions: organizational and managerial activities, pedagogical and research work, in the design and research departments of enterprises, research and design institutions.

Educational-research program of master's training

The specialist gets deep knowledge about the innovative construction and design of mechatronic systems of agricultural machinery based on the classical and modern concepts of mechatronics, the control of the mechanical motion of equipment with programmable support and the theory of digital control.

There is a clear understanding of the stages of the design of hydromechanical and electromechanical systems, the application of elements of technical aesthetics and industrial design for the creation of modern agricultural machinery production.

Areas of employment of graduates

Graduates with the qualification "engineer-designer" are able to perform professional tasks and responsibilities of an innovative nature, provided in the form of economic activity, primary positions in the group of professions: organizational and managerial activities, pedagogical and research work, in the design and research departments of enterprises, research and design institutions.

Practical training

During practical training, the faculty focuses on close interaction and cooperation with the university's research facilities, as well as scientific institutions of the state, such as: VB NUBiP of Ukraine "Velosnatynyna Educational Research Farm. O.V. Mozychenko, V.P. NUBiP of Ukraine "Agronomical Research Station", VN NUBiP of Ukraine "Educational research farm" Vorzel ", VB NUBiP of Ukraine" Boyarsky Forest Research Station". Practical training of students is also carried out at advanced scientific institutions and modern enterprises of agricultural profile, such as: National Science Center "Institute of Mechanization and Electrification of Agriculture", Ukrainian Research Institute of Forecasting and Testing of Machinery and Technologies for Agriculture the production of the name of Leonid Pogorilly, TAN, BelotserkovMAZ, Chervona Zirka, Claas, John Deere, Amako, Astra, Irpinmash.

Proposed Topics of Master's qualification Thesis

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.

Curriculum of Master training
in educational program "Machinery and equipment of agricultural production"
(educational and professional program of master's training)

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Fundamentals of scientific research	4	exam
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 2	Mechanics of structures of technical systems	5	exam
CC 3	Systems of automated designing	6	exam, KP
CC 4	Reliability of technical systems	3	exam
CC 5	Energy-ecological valuation of machines design	5	test, exam
CC 6	Theory of technical systems	5	exam, KP
CC 7	Methods of construction of working bodies of agriculture techniques	5	exam
CC 8	Mechatronics	6	test, exam
CC 9	Reliability of technical systems	5	exam, KP
CC 10	Internship	6	test
CC 11	Research practice	10	test
CC 12	Preparation and defense of master's qualification thesis	6	
Optional components of EPP			
Free choice according to speciality			
OC 1.1	Design of vibration machines	4	exam
OC 1.2	Vibration processes in agroculture technology		
OC 2.1	Design of machinery and equipment in animal husbandry	4	exam
OC 2.2	Human-animal-machine system		
OC 3.1	Designing of machines and equipment in bioenergy	4	exam
OC 3.2	Technological processes in bioenergy		
OC 4.1	Economics of technological systems	4	exam
OC 4.2	Economics of innovation in mechanical engineering		
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Curriculum of Master training
in educational program "Machinery and equipment of agricultural production"
(educational and research program of master's training)

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
GENERAL TRAINING CYCLE			
Compulsory components of ERP			
CC 1	Fundamentals of scientific research	4	exam
CC 2	Theory and methods of scientific research	4	exam
Optional components of ERP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of ERP			
CC 3	Mechanics of structures of technical systems	5	exam
CC 4	Systems of automated designing	5	exam, KP
CC 5	Reliability of technical systems	3	exam
CC 6	Energy-ecological valuation of machines design	5	test, exam
CC 7	Theory of technical systems	5	exam, KP
CC 8	Dynamics and optimization of machines	3	exam
CC 9	Economics of technological systems	4	exam, KP
CC 10	Methods of construction of working bodies of agriculture techniques	4	exam
CC 11	Mechatronics	5	test, exam
CC 12	Reliability of technical systems	5	exam, KP
CC 13	Theoretical and experimental methods of modeling machine units	3	exam
CC 14	Technical support of biotechnical process	3	exam
CC 15.	Industrial nanomaterials and nanotechnology in technique	3	exam
CC 16	Internship	6	test
CC 17	Research practice	15	test
CC 18	Preparation and defense of master's qualification thesis	6	
Optional components of ERP			
Free choice according to speciality			
OC 1.1	Design of vibration machines	4	exam
OC 1.2	Vibration processes in agroculture technology		
OC 2.1	Design of machinery and equipment in animal husbandry	4	exam
OC 2.2	Technological processes in animal husbandry		
OC 3.1	Designing of machines and equipment in bioenergy	4	exam
OC 3.2	Technological processes in bioenergy		
OC 4.1	The theory of mechatronic systems of agricultural machines	4	exam
OC 4.2	Robotics in mechanical engineering		
OC 4.3	Automation of mechanical engineering processes		
OC 5.1	Biomechanics	4	exam
OC 5.2	3d printing		
OC 6.1	Economics of technological systems	4	exam
OC 6.2	Economics of innovation in mechanical engineering		
The total amount of compulsory components		**88**	
The total amount of optional components		**32**	
THE TOTAL AMOUNT OF ERP		**120**	

Annotation of disciplines of the curriculum

Compulsory components

Fundamentals of scientific research. The discipline studies the general provisions of scientific activity, in particular the concept of method and methodology and their role in scientific knowledge, stages of research, the organization of the experiment, the basics of inventive work, including the application for invention, experimental data.

Theory and methods of scientific research. Improving the general theoretical and practical engineering level of future masters of construction by mastering the basics of theoretical knowledge and practical skills on the general concept of experimental research methods.

Mechanics of structures of technical systems. The discipline studies the phenomena that affect the working capacity of technical systems, considers the

construction and technological methods of improving the design of machines, in terms of energy intensity, metal volumes, etc .; provides the theoretical substantiation of the necessary accuracy of elements of structures of technical systems and offers methods of its provision..

Systems of automated designing. The discipline involves raising the general theoretical and practical professional level of future engineers of designers by familiarizing them with modern systems of automated designing of different classes, mastering of functional capabilities and methods of use, mastering the necessary techniques and practical skills of performing design work using the main systems of automated designing.

Reliability of technical systems. It is a complex discipline, which studies: the concept of technical systems and their classification; schemes of reliability of technical systems and their analysis; method of optimizing the number of backup system elements; the theory of graphs; logic-simulation model for reliability testing of technical systems; methods of ensuring the reliability of agricultural machinery, as technical systems.

Energy-ecological valuation of machines design. In this discipline are studied methods and methodics for calculating and designing of the development of technical means at all stages, schemes of construction and functioning of objects of modern new technology for agriculture.

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.

Dynamics and optimization of machines. The course is aimed at studying the dynamic models of specific machines, their mathematical description, calculation of current dynamic loads and recommendations for their reduction during operation.

Economics of technical systems. The economic aspects of making design decisions in order to obtain maximum benefit are studied. Classroom and practical classes in the discipline provide students with mastery of the economic foundations of production in the conditions of agro-industrial enterprises.

Methods of designing working bodies of agriculture machines. The course in this discipline is aimed at studying the existing methods of designing working bodies of agricultural machinery, mastering the functionality and schemes of their use, mastering the necessary techniques and practical skills to perform work using methods of designing the production of agricultural machinery.

Mechatronics The course in this discipline is aimed at familiarizing with the main provisions and directions of the use of mechatronics, which examines the structures of the machine with computer control and the functions of devices and software for their handling.

Reliability of agricultural techniques. This is a complex discipline that studies the patterns of changes in the technical condition of machines and their elements during operation, studies the implementation of methods and ways to eliminate defects and damage, reveals ways to give surfaces the necessary physical and mechanical properties by: surfacing, spraying, application of polymers, electroplating, plastic deformation, electrical methods of processing and thus restoring the efficiency of agricultural machinery.

Theoretical and experimental methods of modeling machine units. It is a complex discipline that studies the methods and techniques of modeling objects that interact with each other and the environment in order to predict the object's response to control influences, analyze its sensitivity to various factors while maintaining the mathematical description of the physical adequacy of a real object.

Technical support of biotechnological processes. Mastering the discipline involves: studying the methods, rules and regulations used during biotechnological production; mastering the basic requirements for the use of products of biotechnological industries; obtaining in-depth knowledge of the principles and processes of work, technological adjustment of the main parameters of bioprocesses that are necessary for their highly efficient use in agro-industrial production; consideration of specific aspects of designing technical equipment of biotechnological processes; study and development of equipment design methodologies taking into account the biological requirements of operation and manufacture.

Industrial nanomaterials and nanotechnologies in engineering. Provides students with theoretical knowledge and practical skills in the science of methods of obtaining nutrients and methods of their physical and chemical analysis, study of their structure and properties of technology, efficiency, study of structural, physicochemical and toxicological aspects of safety of materials and processes of nanoindustry, and technical and technological support of nanoproduction production.

Optional components
Free choice according to speciality

Educational and professional program of master's training
(Choice of 4 disciplines in one of the sub-blocks)

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.

Vibration processes. The discipline studies the basics of methods of analytical description and calculation of oscillations and motion of mechanical systems and general principles of vibration processes, in particular, the main types of calculations of their parameters, as well as means of generating mechanical oscillations and pulses.

Design of machinery and equipment in animal husbandry. This discipline allows you to learn the methods of development and design work items, machinery, equipment, production of mechanized production lines in livestock, systematization and consolidation of knowledge on technology, mechanization, environment, and safety of animal products.

Human-animal-machine system. The study of the discipline is aimed at acquiring comprehensive knowledge and skills that will allow to make reasonable and appropriate management and engineering and technological decisions in the field of efficient management of organic raw materials and waste, in particular, for processing organic waste (raw materials) livestock, crop and other industries. communal, etc.) for high-quality organic fertilizers.

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.

Technological processes in bioenergy. The training course studies the basics of the technological processes of bioenergy production in agriculture, optimization of technological processes of bioenergy.

The theory of mechatronic systems in agricultural machines. The course in this discipline is aimed at getting acquainted with the basic provisions and directions of the use of mechatronics, which studies the structure of a computer-controlled machine and the functions and structures of devices and software for their control.

Economics of technological systems. The economic aspects of making design decisions in order to obtain maximum benefit are studied. Classroom and practical classes in the discipline provide students with mastery of the economic foundations of production in the conditions of agro-industrial enterprises**.**

Economics of innovation. The economic aspects of making design decisions in order to obtain maximum benefit are studied. Classes in the discipline provide students with mastery of the economic foundations of innovative industries in agro-industrial enterprises.

Educational and research program of master's training

(to choose from 6 disciplines in one of the sub-blocks)

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.

Vibration processes. The discipline studies the basics of methods of analytical description and calculation of oscillations and motion of mechanical systems and general principles of vibration processes, in particular, the main types of calculations of their parameters, as well as means of generating mechanical oscillations and pulses.

Design of machinery and equipment in animal husbandry. This discipline allows you to learn the methods of development and design work items, machinery, equipment, production of mechanized production lines in livestock, systematization and consolidation of knowledge on technology, mechanization, environment, and safety of animal products

Human-animal-machine system. The study of the discipline is aimed at acquiring comprehensive knowledge and skills that will allow to make reasonable and appropriate management and engineering and technological decisions in the field of efficient management of organic raw materials and waste, in particular, for processing organic waste (raw materials) livestock, crop and other industries. communal, etc.) for high-quality organic fertilizers.

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.

Technological processes in bioenergy. The training course studies the basics of the technological processes of bioenergy production in agriculture, optimization of technological processes of bioenergy.

The theory of mechatronic systems in agricultural machines. The course in this discipline is aimed at getting acquainted with the basic provisions and directions of the use of mechatronics, which studies the structure of a computer-controlled machine and the functions and structures of devices and software for their control.

Robotics in mechanical engineering. The course in this discipline is aimed at getting acquainted with the basic provisions and directions of the use of robotic systems, which studies the structure of the machine with artificial intelligence and the functions and structure of devices and software for their control.

Automation of mechanical engineering processes. The study of the discipline is aimed at getting acquainted with the basic provisions and areas of use of automated systems, which studies the structure of the machine with automated control.

Biomechanics. The course in this discipline is aimed at getting acquainted with the basic provisions and directions of using biomechanics as a prototype of the structure of a machine unit.

3d printing. The course in this discipline is aimed at getting acquainted with the main provisions and areas of use of modern three-dimensional printing technologies, software development and the use of 3D printers.

Economics of technological systems. The economic aspects of making design decisions in order to obtain maximum benefit are studied. Classroom and practical classes in the discipline provide students with mastery of the economic foundations of production in the conditions of agro-industrial enterprises.

Economics of innovation. The economic aspects of making design decisions in order to obtain maximum benefit are studied. Classes in the discipline provide students with mastery of the economic foundations of innovative industries in agro-industrial enterprises.

Training of masters of sciences in branch of knowledge "Mechanical Engineering" in specialty 133 "MECHANICAL ENGINEERING" educational program "FOREST COMPLEX EQUIPMENT"

Type of studying:	Licensed persons:
– full-time studying	50
Duration of studying:	
- full-time educational-professional program	1 years 4 months
Credits:	
– educational-professional program	90
Language	Ukrainian, English
Academic degree	Master of Mechanical Engineering

Concept of traning

The training of masters in specialty 133 "Sectoral engineering" of the educational program "Forestry equipment" is based on the systematic approach of mastering special skills and knowledge that are sufficient for the fulfillment of professional tasks and responsibilities of innovative character in the field of construction, design, testing, certification, maintenance and utilization of machinery and equipment of the forest complex.

The specialist gets deep knowledge of the design, engineering and testing of forestry equipment based on the theory of technical systems, a clear understanding of the stages of system evaluation and testing methods of forestry equipment in accordance with sectoral, national and international standards.

There is a clear understanding of the design of the forest complex equipment - as a complex mechanical system. An assessment of the quality of repaired and non-repaired systems is carried out, and their reliability is ensured.

Educational-professional program of master's training

The specialist gets deep knowledge of the design, engineering and testing of forestry equipment based on the theory of technical systems, a clear understanding of the stages of system evaluation and testing methods of forestry equipment in accordance with sectoral, national and international standards.

There is a clear understanding of the design of the forest complex equipment - as a complex mechanical system. An assessment of the quality of repaired and non-repaired systems is carried out, and their reliability is ensured.

Areas of employment of graduates

Graduates with the qualification "engineer mechanic" are able to perform professional tasks and responsibilities of an innovative nature, provided in the form of economic activity, primary positions in the group of professions: organizational and managerial activities, pedagogical and research work, in the design and research departments of enterprises, research and design institutions.

Practical training

During practical training, the faculty focuses on close interaction and cooperation with the university's research facilities, as well as scientific institutions of the state, such as: VB NUBiP of Ukraine "Velosnatynyna Educational Research Farm. O.V. Mozychenko", VB NUBiP of Ukraine" Agronomic Experimental Station", VN NUBiP of Ukraine

"Educational Research Farm "Vorzel", VB NUBiP of Ukraine "Boyarsky Forest Research Station". Practical training of students is also carried out at advanced scientific institutions and modern enterprises of rural and such as: the National Science Center "Institute of Mechanization and Electrification of Agriculture", the Ukrainian Research Institute for predicting and testing equipment and technologies for agriculture Arsenal Production named after Leonid Pogorilly, TAN, John Deere, Amako, Astra, State Forestry Agency of Ukraine.

Proposed Topics of Master's qualification Thesis

1. Justification of the structural parameters of the chipper of wood materials.
2. Investigation of the drying process of wood raw materials and justification of the parameters of the dryer.
3. Justification of the parameters of the hydraulic booster mechanism for cutting wood.
4. Optimization of the rotation mode of a stationary jib crane for timber transportation.
5. Investigation of technical condition and development of technological process of repair of wood shredder.

Curriculum of Master training in educational program "Forest complex equipment" (educational-professional training program)

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Fundamentals of scientific research	4	exam
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 2	Dynamics of machines for forestry	5	exam
CC 3	Computer design of equipment for forestry	5	exam, KP
CC 4	Energy ecological assessment of construction of equipment for forestry	5	exam
CC 5	Mechatronic systems of machines for forestry	8	test, exam
CC 6	Theory and designing of machines for forestry	4	exam, KP
CC 7	Reliability of machines for forestry	7	exam
CC 8	Methods of designing the working bodies of machines for forestry	6	test, exam
CC 9	Internship	6	exam, KP
CC 10	Research practice	10	test
CC 11	Preparation and defense of master's qualification thesis	6	test
Optional components of EPP			
Free choice according to speciality			
OC 1.1	Designing of technical systems for forestry (of vibration action)	4	exam
OC 1.2	Vibration processes in machines for forestry		
OC 2.1	Designing of technical systems for forestry	4	exam
OC 2.2	Technological processes in machines for forestry		
OC 3.1	Reliability of technical systems in machines for forestry	4	exam

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
OC 3.2	Reliability of technological systems in machines for forestry		
OC 4.1	Economics of technological systems	4	exam
OC 4.2	Economics innovation in machines for forestry		
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotation of disciplines of the curriculum

Compulsory components of EPP

Fundamentals of scientific research. The discipline studies the general provisions of scientific activity, in particular the concept of method and methodology and their role in scientific knowledge, stages of research, the organization of the experiment, the basics of inventive work, including the application for invention, experimental data.

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.

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.

Energy ecological assessment of construction of machines for forestry. In this discipline the methods and techniques of calculation and design at all stages of development of technical means, schemes of construction and functioning of objects of modern new equipment of machines for forestry are studied.

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.

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 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.

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

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.

Methods of designing the working bodies of machines for forestry. The course on this discipline is aimed at understanding the existing basics of designing the work equipment of the forestry equipment complex, assimilating the functional capabilities and schemes of their use, mastering the necessary techniques and practical skills in the

implementation of work using the methods of designing the production purpose of forestry engineering.

Optional components of EPP

Free choice according to speciality

(Choice of 4 disciplines in one of the sub-blocks)

Designing of technical systems for forestry (of vibration action). The discipline studies the principles and methods of analytical description and calculation of oscillations and motion of mechanical systems, general principles of design of vibration machines, calculations of their basic parameters, means of generating mechanical oscillations and pulses, as well as design features of vibration machines in forestry.

Vibration processes in machines for forestry. The course studies the basics of methods of analytical description and calculation of oscillations and motion of mechanical systems of machines for forestry and general principles of vibration processes, in particular, the main types of calculations of their parameters, as well as means of generating mechanical oscillations and pulses.

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.

Technological processes of machines for forestry. The training course studies the basics of passing the technological processes of machines for forestry, and their optimization.

Reliability of technical systems in machines for forestry. The discipline is complex, which studies: the concept of technical systems and their classification; reliability schemes of technical systems and their analysis; method of optimizing the number of spare elements of systems; graph theory; apparatus of logical-simulation modeling for research of reliability of technical systems; methods of ensuring the reliability of technical equipment systems of the forest complex.

Reliability of technological systems in machines for forestry. The course in this discipline is aimed at studying engineering methods of testing technological systems of forest equipment, which allow to obtain an objective assessment of structural, technological and operational properties of equipment and determine their compliance with technical tasks and current technological requirements for work processes.

Economics of technological systems. The economic aspects of making design decisions in order to obtain maximum benefit are studied. Classroom and practical classes in the discipline provide students with mastery of the economic foundations of production in the conditions of agro-industrial enterprises.

Innovation Economics in machines for forestry. The economic aspects of making design decisions in order to obtain maximum benefit are studied. Classes in the discipline provide students with mastery of the economic foundations of innovative industries in the forest complex.

Training of masters of sciences in branch of knowledge "Mechanical Engineering" in specialty 133 "MECHANICAL ENGINEERING" educational program "TECHNICAL SERVICE OF MACHINES AND EQUIPMENT OF AGRICULTURAL PRODUCTION"

Type of studying:	Licensed persons:
– full-time studying	50
Duration of studying:	
- full-time educational-professional program	1 years 4 months
Credits:	
– educational-professional program	90
Language	Ukrainian, English, German
Academic degree	Master of Mechanical Engineering

Concept of traning

The training of masters in specialty 133 "Sectoral engineering" of the educational program "Technical service of machines and equipment of agroindustrial complex" is based on the systematic approach of mastering special skills and knowledge sufficient for the fulfillment of professional tasks and responsibilities of innovative character in the field of construction, design, testing, certification , maintenance and utilization of machinery and equipment.

The specialist gets deep knowledge of design, engineering and testing techniques based on the theory of technical systems, a clear understanding of the stages of system evaluation and test methods in accordance with sectoral, national and international standards.

A clear understanding of the technical service of machinery and equipment of agro-industrial complex is foreseen. An assessment of the quality of repaired and nonrepaired systems is carried out, and their reliability is ensured.

Educational-professional program of master's training

The specialist gets deep knowledge of design, engineering and testing techniques based on the theory of technical systems, a clear understanding of the stages of system evaluation and test methods in accordance with sectoral, national and international standards.

A clear understanding of the technical service of machinery and equipment of agro-industrial complex is foreseen. An assessment of the quality of repaired and nonrepaired systems is carried out, and their reliability is ensured.

Areas of employment of graduates

Graduates with the qualification "engineer mechanic" are able to perform professional tasks and responsibilities of an innovative nature, provided in the form of economic activity, primary positions in the group of professions: organizational and managerial activities, pedagogical and research work, in the design and research departments of enterprises, research and design institutions.

Practical training

During practical training, the faculty focuses on close interaction and cooperation with the university's research facilities, as well as scientific institutions of the state, such as: VB NUBiP of Ukraine "Velosnatynyna Educational Research Farm. O.V. Mozychenko",

VB NUBiP of Ukraine" Agronomic Experimental Station", VN NUBiP of Ukraine "Educational Research Farm "Vorzel", VB NUBiP of Ukraine "Boyarsky Forest Research Station". Practical training of students is also carried out at advanced scientific institutions and modern enterprises of rural and such as: the National Science Center "Institute of Mechanization and Electrification of Agriculture", the Ukrainian Research Institute for predicting and testing equipment and technologies for agriculture Arsenal Production named after Leonid Pogorilly, TAN, John Deere, Amako, Astra, State Forestry Agency of Ukraine.

Proposed Topics of Master's qualification Thesis

1. Justification of the structural parameters of the unit of agricultural machinery.
2. Investigation of the process and substantiation of parameters of the feed mill.
3. Justification of the parameters of the hydro-boosting mechanism.
4. Optimization of the rotation mode of a stationary jib crane for timber transportation.
5. Investigation of the technical condition and development of the technological process of repairs of this technology.

Curriculum of Master training in educational program "Technical service of machinery and equipment of agricultural production" (educational-professional training program)

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Fundamentals of scientific research	4	exam
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 2	Mechanics of constructions of technical systems of technical service	5	exam
CC 3	Automated design systems	6	exam, KP
CC 4	Energy ecological assessment of construction of machines	5	exam
CC 5	Management and logistics of service enterprises	7	test, exam
CC 6	Qualimetry	4	exam, KP
CC 7	Reliability of equipment of technical service	8	exam
CC 8	Methods of designing of equipment for technical service	5	test, exam
CC 9	Internship	6	exam, KP
CC 10	Research practice	10	test
CC 11	Preparation and defense of master's qualification thesis	6	test
Optional components of EPP			
Free choice according to speciality			
OC 1.1	Planning of technical service companies	4	exam
OC 1.2	Technological systems of repair production		
OC 2.1	Design of technological processes of technical service	4	exam
OC 2.2	Rationing of operations of technical service		
OC 3.1	Reliability of technical systems of technical service	4	exam
OC 3.2	Reliability of technological systems of technical service		
OC 4.1	Economics of technological systems	4	exam

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
OC 4.2	Economics of innovation in machinery		
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotation of disciplines of the curriculum

Compulsory components of EPP

Fundamentals of scientific research. The discipline studies the general provisions of scientific activity, in particular the concept of method and methodology and their role in scientific knowledge, stages of research, the organization of the experiment, the basics of inventive work, including the application for invention, experimental data.

Mechanics of constructions of technical systems of the technical service. The course is aimed at studying the dynamic models of specific machines and equipment of agricultural machinery, their mathematical description, calculation of current dynamic loads and recommendations for their reduction during operation.

Automated design systems. The discipline involves raising the general theoretical and practical professional level of future engineers of designers by familiarizing them with modern systems of automated designing of different classes, mastering of functional capabilities and methods of use, mastering the necessary techniques and practical skills of performing design work using the main systems of automated designing.

Energy ecological assessment of machine design. This discipline studies the methods and techniques of calculation and design at all stages of development of technical means, schemes of construction and operation of modern new equipment.

Management and logistics of service enterprises. The discipline studies the principles and methods of analytical management of enterprises of technical service, calculations of their main parameters, as well as logistics features in the field of technical service.

Qualimetry. This discipline studies the existing methods of calculations in technical measurements.

Reliability of equipment of technical service. This is a complex discipline, which studies: the laws of changing the technical condition of machines and their elements during operation, methods and methodics for eliminating defects and damage, providing the surfaces of parts the necessary physical and mechanical properties; technological processes of restoration of performance of typical details of agricultural machinery and equipment of technical service.

Methods of designing the equipment of the technical service. The course on this discipline is aimed at understanding the existing basics of designing agricultural machinery working units, assimilation of functional capabilities and schemes of their use, mastering the necessary techniques and practical skills in the implementation of works using the methods of designing the production purpose of agricultural machinery.

Optional components of EPP

Free choice according to speciality

(Choice of 4 disciplines in one of the sub-blocks)

Planning of technical service companies. The course on this discipline is aimed at studying the theoretical foundations and principles of optimization of agricultural machinery, the bases of calculation of productivity and technological harmonization of

autonomous machines and flow lines, rational schemes of planning and methods of designing and optimizing technological processes of service enterprises.

Technological systems of repair production. The discipline studies technological systems of repair production, a technique of their designing, calculations and selection of technological equipment and executors of technological processes of the enterprises of the technical service.

Rationing of operations of technical service. The discipline studies the principles and methods of establishing standards for technological operations in the performance of service work.

Reliability of technical systems of technical service. The discipline is complex, which studies: the concept of technical systems and their classification; schemes of reliability of technical systems and their analysis; method of optimizing the number of backup system elements; the theory of graphs; logic-simulation model for reliability testing of technical systems; methods of ensuring the reliability of technical systems of agricultural machinery**.**

Economics of technological systems. The economic aspects of making design decisions are considered in order to maximize the benefits. Audit and practical classes on discipline envisage students mastering the economic bases of production in the conditions of agroindustrial enterprises.

Economics of innovation in machinery. The economic aspects of making design decisions in order to obtain maximum benefit are studied. Classes in the discipline provide students with mastery of the economic foundations of innovative industries in agro-industrial enterprises.

Training of masters of sciences in branch of knowledge "Mechanical Engineering" in specialty 133 "MECHANICAL ENGINEERING" educational program "ROBOTIC SYSTEMS AND COMPLEXES OF AGRICULTURAL PRODUCTION"

Type of studying:	Licensed persons:
– full-time studying	12
Duration of studying:	
- full-time educational-professional program	1 years 4 months
Credits:	
– educational-professional program	90
Language	Ukrainian, English
Academic degree	Master of Mechanical Engineering

Concept of traning

Training of masters in specialty 133 "Mechanical engineering", the educational program "Robotic systems and complexes of agricultural production" is based on a systematic approach to mastering special skills and knowledge that are sufficient for the performance of professional tasks and duties of an innovative nature in the field of design, production, use, evaluation efficiency and utilization of robotic systems in the field of agricultural production.

The specialist gets deep knowledge of design, engineering and testing techniques based on the theory of technical systems, a clear understanding of the stages of system evaluation and test methods in accordance with sectoral, national and international standards.

Focus on the ability to carry out productive, technological, organizational, management and scientific research activities at industrial engineering enterprises specializing in the production of robotic systems of all forms of ownership; construction, technological, project and research work in project and technological and educational institutions.

Educational-professional program of master's training

The specialist receives in-depth knowledge of the construction, engineering and testing of robots and robotic systems used in agricultural production, a clear understanding of the stages of systematic evaluation and methods of constructing and testing robots in accordance with industry, national and international standards.

A clear understanding of the processes of development and use of robots and robotic systems in the agricultural sector is expected.

Areas of employment of graduates

Graduates with the qualification of Master of Industrial Engineering are able to perform professional tasks and duties of an innovative nature, which are provided in the form of development and construction of robots and robotic systems in the field of agriculture. They can work in primary positions in a group of professions: construction, organizational and management, teaching and research. Graduates can be employed in construction and research departments of enterprises, research and project institutions, production units of agricultural enterprises.

Practical training

During practical training, the faculty focuses on close interaction and cooperation with the university's research facilities, as well as scientific institutions of the state, such as: VB NUBiP of Ukraine "Velosnatynyna Educational Research Farm. O.V. Mozychenko", VB NUBiP of Ukraine" Agronomic Experimental Station ", VN NUBiP of Ukraine "Educational Research Farm "Vorzel", VB NUBiP of Ukraine "Boyarsky Forest Research Station". Practical training of students is also carried out at advanced scientific institutions and modern enterprises of rural and such as: the National Science Center "Institute of Mechanization and Electrification of Agriculture", the Ukrainian Research Institute for predicting and testing equipment and technologies for agriculture Arsenal Production named after Leonid Pogorilly, TAN, John Deere, Amako, Astra, State Forestry Agency of Ukraine.

Proposed Topics of Master's qualification Thesis

1. Planning the trajectory of the working body of the robot.
2. Optimization of the movement of the robot manipulation system.
3. Designing a robot gripper.
4. Development of a motion control system for a mobile robot for weeding garlic.
5. Optimization of mobile robot movement on the field for growing crops

Curriculum of Master training in educational program "Robotic systems and complexes of agricultural production" (educational-professional training program)

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Fundamentals of scientific research	4	exam
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 2	Theory of robot control	5	exam, КР
CC 3	Modern optimization methods	6	exam
CC 4	Computer vision	3	exam
CC 5	Robotization of agricultural production	5	exam
CC 6	Designing robots and manipulators	5	exam
CC 7	Digital signal processing	5	exam
CC 8	Artificial intelligence systems	6	test, exam, КР
CC 9	CADS of robots	5	exam, КР
CC 10	Industrial practice	6	test
CC 11	Production and research practice	10	test
CC 12	Preparation and defense of master's qualification thesis	6	
Optional components of EPP			
Free choice according to speciality			
OC 1.1	Planning the movement of robots and manipulators	4	exam
OC 1.2	Dynamics of robots		
OC 2.1	3D printing in additive technologies	4	exam
OC 2.2	Materials of additive technologies		
OC 3.1	Hardware part of robot control systems	4	exam

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
OC 3.2	Schematics of robots		
OC 4.1	Technical project management	4	exam
OC 4.2	Economic evaluation of robotics systems application		
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotation of disciplines of the curriculum

Compulsory components of EPP

Fundamentals of scientific research. The discipline studies the general provisions of scientific activity, in particular the concept of method and methodology and their role in scientific knowledge, stages of research, the organization of the experiment, the basics of inventive work, including the application for invention, experimental data.

Theory of robot control. The course " Theory of Robot Control" will allow students to get acquainted with the theory of control, robot motion dynamics, sensor information, and robotics algorithms. They will learn how to design and implement controllers for different types of robots, taking into account their characteristics, the environment in which they operate, and the tasks they are assigned. The discipline also includes practical classes, during which students will be able to test their knowledge and skills on models of real robots. They will gain experience with a variety of robots, including manipulators, mobile robots, and drones.

Modern optimization methods. The discipline involves mastering the mathematical methods of numerical optimization used in modern applied areas related to robotics (gradient methods, stochastic methods, including agent-based methods). In addition, students will gain skills in using these methods for specific tasks of robot design, motion planning, sensor signal processing, etc.

Computer vision. The discipline "Computer Vision" covers theoretical and practical knowledge of processing and analyzing images obtained from various sources in the field of robotics. Students will be introduced to collecting data from visual sources, including cameras and sensors, and learn how to apply image processing algorithms to extract useful information. They will study various methods for improving image quality and resolution, as well as algorithms for determining the shapes, sizes, and other properties of objects in an image. In addition, students will learn machine learning techniques used for pattern recognition and image processing, such as neural networks and various classification algorithms. Practical exercises will include the use of software for image processing and analysis in the OpenCV resource.

Robotization of agricultural production. In this discipline, students will study the applicability of robots to various tasks of agricultural production, various aspects of robotization of agricultural production (crop production, livestock production, processing industry). In addition, students will learn how to apply the acquired knowledge in practical tasks, such as the development and programming of robots for robotization of plant and animal husbandry processes, as well as control and monitoring of agricultural machinery.

Designing robots and manipulators. The discipline "Design and construction of robots and manipulators" is an integral part of the formation of students' professional competence. The program of the discipline involves a comprehensive study of theoretical and practical material on the calculation and design of mechanical systems of robots and manipulators, both stationary and mobile autonomous systems for agriculture. Calculation and design of elements, working bodies and equipment of robots. The study of the

discipline "Design and construction of robots, manipulators" will allow you to gain knowledge and skills sufficient to independently solve design, engineering and production and technological problems in the specialty 133 " Mechanical Engineering". The acquired knowledge and skills allow you to use engineering techniques, analytical and numerical calculation methods to analyze known and develop new mechanisms, components, technological equipment, and machine complexes for agricultural production.

Digital signal processing. The course in this discipline is aimed at learning how to process signals and analyze them using digital methods. Students will learn various digital signal processing techniques such as discrete Fourier transform, filtering, correlation, and signal decomposition. They will also learn about various tools and software for signal analysis and processing.

Artificial Intelligence Systems. This course covers the latest developments in the field of robotics that use artificial intelligence technologies. As part of the course, students will learn the basics of machine learning, neural networks, deep learning, and other artificial intelligence methods. Students will have the opportunity to study applied tasks using artificial intelligence systems in robotics, such as robot navigation, position and orientation determination, robot interaction with humans, and others**.**

CADS of robots. The discipline "CADS of robots" involves a comprehensive study of computer modeling systems in the creation of 3D models, their research, analysis and, as a result, the preparation of construction documentation for the manufacture of robots, their elements, working bodies and equipment. The study of the discipline "CADS of robots" will allow you to gain knowledge and skills sufficient to independently solve design and construction problems in the specialty 133 " Mechanical Engineering". The acquired knowledge and skills allow you to use engineering techniques, analytical and numerical calculation methods to analyze known and develop new mechanisms, components, technological equipment, and machine complexes for agricultural production.

Optional components of EPP

Free choice according to speciality

(Choice of 4 disciplines in one of the sub-blocks)

Planning the movement of robots and manipulators. The discipline "Planning the movement of robots and manipulators" is part of the robotics curriculum, which covers the theoretical knowledge and practical skills necessary to ensure the planning of robot and manipulator trajectories. Students will become familiar with the basic algorithms for planning motion trajectories, such as forward and inverse kinematic transformation algorithms, interpolation methods, optimal path selection methods, and others.

Dynamics of robots. Discipline "Dynamics of Robots" is a part of the robotics curriculum that covers the theoretical knowledge and practical skills necessary to understand and analyze the dynamic properties of robots. Students will be introduced to the basic concepts of kinematics, dynamics, and motion control of robots. They will learn to understand the motion of robots in terms of forces and moments, and learn the basic algorithms of motion dynamics. The course also includes practical classes, during which students will be able to test their knowledge and skills on models of real robots. They will gain experience with various types of robots and have the opportunity to study and analyze their dynamics.

3D printing in additive technologies. The discipline "3D Printing in Additive Technologies" covers theoretical and practical knowledge about the process of creating three-dimensional objects using additive technologies for the needs of constructing robots and manipulators. Students will be introduced to various types of additive technologies and materials used for 3D printing, as well as the process of preparing a model for printing and

the means of processing it. Practical classes will include working with software for creating and processing models, selecting materials and printing parameters, installing and configuring printers, and working with different types of printed materials.

Materials of additive technologies. The discipline "Materials of Additive Technologies" covers theoretical and practical knowledge of materials used to create three-dimensional objects using additive technologies. Students will be introduced to the various materials used for 3D printing, including polymers, metals, ceramics, and composites. They will learn about the properties of materials and their impact on the printing process and the quality of the final product. Practical exercises will include selecting materials for specific printed parts, testing material properties, print quality, and the impact of various parameters on the final result.

Hardware part of robot control systems. The course covers theoretical and practical knowledge of the hardware of robot control systems. Students will be introduced to the components and circuits of electronic robot control systems, such as microcontrollers, motor drivers, sensors, and other components. They will learn about the principles of operation and configuration of these components, as well as the various ways of communication between the hardware and software parts of robot control systems. Practical exercises will include designing and assembling electronic circuits for robot control systems, installing and configuring sensors and other components, testing and adjusting robot control systems on real robot models.

Schematic of robots. The discipline covers theoretical and practical knowledge of the construction and development of electronic circuits for robots. Students will be introduced to the principles and methods of designing robot circuits, including board design and assembly, selection and configuration of electronic components, measurement and analysis of the parameters of electrical circuits and their interaction with robots. Practical exercises will include designing and assembling electronic circuits for robots, installing and configuring sensors and other components, testing and adjusting robots on real projects.

Technical project management. This course introduces the basic concepts of project management, including planning, executing, controlling, and evaluating project results. Students will learn the practical aspects of technical project management, such as stakeholder engagement, quality assurance, and cost control. They will also learn how to use various tools and software to help manage projects.

Economic evaluation of the robotics systems application. The course examines the economic aspects of making design decisions when designing robotic systems to maximize benefits. Classes in the discipline involve students mastering the economic fundamentals of innovative production for agro-industrial enterprises.

Training of masters of sciences in branch of knowledge "Architecture and Construction" Specialty 192 "CONSTRUCTION AND CIVIL ENGINEERING" educational program "CONSTRUCTION AND CIVIL ENGINEERING"

Type of studying:	Licensed persons:
– full-time studying	25
Duration of studying:	
- full-time educational-professional program	1 years 4 months
- full-time educational-research program	1 years 10 months
Credits:	
– educational-professional program	90
- educational-research program	120
Language	Ukrainian, English
Academic degree	engineer-researcher of construction

Concept of traning

Providing knowledge, skills and abilities of a specialist of a new innovative generation in the field of industrial and civil construction of objects of agro-industrial and environmental complexes on the basis of modern educational standards adapted to the requirements of the world's best educational programs for work in the public and private sectors of the Ukrainian economy.

The program provides for the realization of works commissioned by strategic partners for the development of innovative projects for industrial and civil construction of objects of agro-industrial and nature protection complexes.

Educational and professional program of master's training

The program provides for the realization of works commissioned by strategic partners for the development of innovative projects for industrial and civil construction of objects of agro-industrial and nature protection complexes.

Areas of employment of graduates

The graduate receives a full higher education and can work in positions corresponding to the 4th qualification level according to the state classifier of professions: assistant; teacher of a higher educational institution, engineer (civil engineering); construction supervisor; engineer-designer (civil engineering); engineer training; researcher (branch of engineering); Safety Engineer; engineer for patent and inventive work; production engineer; quality engineer; engineer for the introduction of new technique and technology; standardization engineer; design engineer; engineer researcher.

Educational and research program of master's training

The program provides for the implementation of work commissioned by strategic partners for the development of innovative projects for industrial and civil construction of agro-industrial and environmental complexes, conducting research in the field of construction.

Areas of employment of graduates

The graduate receives a full higher education and can work in positions that correspond to the 4th qualification level according to the state classifier of professions:

assistant; higher education teacher, engineer (civil engineering); construction supervision engineer; design and estimate engineer; design engineer (civil engineering); training engineer; researcher (engineering field); Safety Engineer; patent and invention engineer; production preparation engineer; quality engineer; engineer for the introduction of new equipment and technology; standardization engineer; design engineer; research engineer.

Practical training

Practical training of specialists is carried out in DP Knauf marketing Ukraine, Research Institute "Ukragroobrazovaniia", research institute "Ukragropromproduktivnost", research institute of construction production, design and development bureau of the Ukrainian research institute of forecasting and testing of technique and technologies for agricultural production named after. Leonid Pogorilly", Design and Development Bureau of the National Science Center "Institute of Mechanization and Electrification of Agriculture", "Agrobusiness Alliance «Astra" LLC, "John Deere Ukraine" LLC, "Newest Agro-Industrial Technologies", Research Institute of Building Structures, other practical bases training of students (listeners) of the university from among the leading institutions, enterprises, organizations in Ukraine and abroad, with appropriate conditions for conducting students' practice in accordance with the requirements of educational and professional programs of training specialists.

Proposed Topics of Master's qualification Thesis

1. Office building of a state-owned agricultural enterprise using effective reinforced concrete slabs.
2. Steel frame made of welded twisted-nets of variable section with a flexible wall.
3. Non-woven and ferruginous steel reinforced concrete floors.
4. Technology of construction / deconstruction of an automobile overpass of agrarian grain-terminal complex.
5. Fire resistance of steel-reinforced concrete floors.
6. Reconstruction of the building "Agroleasing" with the superstructure.
7. Metal structures reinforced with carbon plastics, with static loading.
8. Steel-reinforced concrete beam structures with external reinforcement.
9. Fiber reinforced elements reinforced with steel fibers.
10. Multi-porous plates, reinforced with steel profiled flooring.

Curriculum of Master training in educational program "Construction and civil engineering" (educational and professional program of Master's training)

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Industrial and environmental safety in construction	4	exam
Elective components			
Preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 2	Modeling of buildings and structures for agricultural purposes	5	exam, KP
CC 3	Reconstruction of buildings and structures	4	exam

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
CC 4	Basics of system analysis	4	exam
CC 5	Testing of building structures	4	exam
CC 6	Repair and exploitation of buildings and structures	4	exam
CC 7	Engineering protection and site preparation	4	exam
CC 8	CAD in construction	5	exam, KP
CC 9	Volume and spatial solutions for buildings and structures	6	exam, test, KP
CC 10	Technology of construction of buildings and structures for agricultural purposes	4	exam
CC 11	Internship	6	test
CC 12	Research practice	15	test
CC 13	Preparation and defense of master's qualification thesis	6	
Optional components of EPP			
Free choice according to speciality			
OC 1.1	Scientific bases of the theory of reliability and risks in construction	4	exam
OC 1.2	Scientific hypotheses and their experimental testing in construction		
OC 2.1	Mechatronic systems in construction	4	exam
OC 2.2	Construction robotics		
OC 2.3	Automation of residential and commercial buildings		
OC 3.1	Estimate and contractual documentation	4	exam
OC 3.2	Economics of innovation in construction		
OC 4.1	Theory and methods of scientific research	4	exam
OC 4.2	Industrial nanomaterials and nanotechnologies		
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Curriculum of Master training in educational program "Construction and civil engineering" (educational and research program of master's training)

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
GENERAL TRAINING CYCLE			
Compulsory components of ERP			
CC 1	Industrial and environmental safety in construction	4	exam
CC 2	Fundamentals of scientific research	4	exam
Optional components of ERP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of ERP			
CC 3	Modeling of buildings and structures for agricultural purposes	5	exam, KP
CC 4	Reconstruction of buildings and structures	4	exam
CC 5	Basics of system analysis	4	exam
CC 6	Testing of building structures	4	exam
CC 7	Repair and exploitation of buildings and structures	4	exam
CC 8	Engineering protection and site preparation	4	exam
CC 9	Dynamics and stability of buildings and structures	4	exam
CC 10	CAD in construction	5	exam, KP
CC 11	Volume and spatial solutions for buildings and structures	5	exam

Code	Components of the educational program (academic disciplines, course projects (works), practices, qualification work)	Number of credits	Form of final control
CC 12	Scientific and engineering research in construction	4	exam
CC 13	Spatial solutions of buildings and structures	6	exam, test, KP
CC 14	Technology of construction of buildings and structures for agricultural purposes	4	exam
CC 15.	Internship	6	test
CC 16	Research practice	15	test
CC 17	Preparation and defense of master's qualification thesis	6	
Optional components of ERP			
Free choice according to speciality			
OC 1.1	Scientific bases of the theory of reliability and risks in construction	4	exam
OC 1.2	Scientific hypotheses and their experimental testing in construction		
OC 2.1	Energy efficiency of buildings and structures	4	exam
OC 2.2	Energy efficient materials and technologies in construction		
OC 3.1	Mechatronic systems in construction	4	exam
OC 3.2	Construction robotics		
OC 3.3	Automation of residential and commercial buildings		
OC 4.1	Ecological building materials and technologies	4	exam
OC 4.2	Assessment of environmental safety of construction sites		
OC 5.1	Industrial nanomaterials and nanotechnologies	4	exam
OC 5.2	3-d printing in construction technology		
OC 6.1	Estimate and contractual documentation	4	exam
OC 6.2	Economics of innovation in construction		
The total amount of compulsory components		**88**	
The total amount of optional components		**32**	
Total		**120**	

Annotation of disciplines of the curriculum

Compulsory components

Industrial and environmental safety in construction. The discipline considers the issues of functioning of the labor protection management system at construction enterprises - tasks, documentation, training on labor protection issues, labor safety control, etc. The discipline describes in detail the industrial hazardous and harmful factors in the construction industry, it presents the safety requirements that must be met when performing various works on the construction site. Environmental safety in construction studies the relationship between living organisms and the organic nature that surrounds them and the impact on them of construction, construction industry and construction machinery and mechanisms, as well as technological processes used in the preparation of construction sites.

Fundamentals of scientific research. The discipline studies the general provisions of scientific activity, in particular the concept of method and methodology and their role in scientific knowledge, stages of research, the organization of the experiment, the basics of inventive work, including the application for invention, experimental data.

Modeling of buildings and structures. To consolidate and deepen students' knowledge of theoretical material, as well as acquire skills to independently adopt technological and organizational decisions in matters of building norms of Ukraine, designing of technology and complex mechanization of mounting processes.

Reconstruction of buildings and structures. Obtaining theoretical knowledge and practical skills that will be needed in practical activities. Interdependent system of preparation for implementation of certain types of work, establishment and maintenance of

general order, priority and terms of work, supply of all kinds of resources to ensure the efficiency and quality of performance of certain types of work or in the process of reconstruction of buildings and structures.

Basics of system analysis. To form students knowledge of the basics of system analysis as a science, its goals and objectives, the main categories; to form skills in the organization of educational and scientific work for further implementation by a future specialist during the professional activity of research, teaching and management functions.

Testing of building constructions. To acquaint students with the basics, methods and innovative approaches of building construction testing (bases and foundations, reinforced concrete structures, metal constructions): with separate products and structural elements that are parts of buildings; with the appointment and interconnection of structures between themselves; with the basic requirements for structural elements of buildings and the buildings themselves, taking into account the specific conditions of their operation.

Repair and operation of buildings and structures. The theoretical basis for the repair and operation of structures of agricultural purpose.

Engineering protection and preparation of territory. Town-planning assessment of the territory by natural factors. Vertical planning of the city territory. Quantitative assessment of the relief. Methods of vertical planning. Rainwater drainage in the system of discharge of surface water. Theoretical foundations of designing territories in which dangerous physico-geological processes take place. Engineering improvement of rural territories of different purposes. Theoretical foundations of struggle with transport and industrial noise, gas pollution. Lighting of rural territories. Sanitary facilities. Organization of the collection of surface runoff.

Dynamics and stability of buildings and structures. Provides the basis for dynamic calculation of buildings and structures for sustainability.

CAD in construction. General information on the composition of the working project. Basic design kits. Composition of drawings of the basic kits of the mark GP, AR. Using the computer program "ArchiCAD" to perform architectural and construction drawings: plans for improvement, building plans, sections, facades, photorealistic perspective images. Using the textures of the "InteAr" library to cover the surface of walls, ceilings, roofs and objects. Corel Draw: Create new textures and edit existing ones; Editing JPEG and BMP image quality for better quality. Reproduction and assembly of drawings.

Diagnosis of the technical condition of buildings and structures. The course examines the main causes of damage to buildings and structures, equipment and methods of inspections and determination of the technical condition of construction sites.

Scientific and engineering research in construction. Provides theoretical and practical knowledge of engineering construction training.

Spatial solutions of buildings and structures. Theoretical basis of teaching theoretical foundations and principles for the development of effective building structures, methods of their management and automatic means of realization of systems in agricultural construction.

Technology of construction of buildings and structures for agricultural purposes. Theoretical bases of design of buildings and structures of this appointment, methods of their management and automatic means of realization of systems in agricultural construction.

Optional components
Free choice according to speciality

Educational and professional program of master's training
(Choice of 4 disciplines in one of the sub-blocks)

Scientific bases of the theory of reliability and risks in construction. To give knowledge about legal, organizational and methodical bases of the theory of reliability of houses and risks of innovative activity and innovative engineering technologies in agricultural construction.

Scientific hypotheses and their experimental testing in construction. The discipline is the theoretical basis of the set of knowledge and skills on the basis of which the future specialist will solve professional problems of conducting scientific research in the field of construction and acquires knowledge about the actual work of building structures, relevant properties of building materials, learns to create and apply real scientific substantiated calculation scheme of a building or structure, acquires skills in the sequence of scientific research in the construction industry and their analysis.

Mechatronic systems in construction. Teaching theoretical foundations and principles of construction of mechatronic systems in construction. Theoretical bases of construction of mechatronic systems, methods of their control and automatic means of realization of mechatronic systems in agricultural construction.

Construction robotics. Robotization replaces the hard work of builders with intelligent machines, increases productivity and quality of construction work, safety at construction sites and conservation of material and energy resources, as well as ensures the smooth operation of the entire construction complex. Knowledge of theoretical principles for the implementation of robotic systems in construction production plays an important role in the formation of a modern civil engineer. The course reveals the interdisciplinary connections on the basis of which modern buildings are designed and created using robots.

Automation of residential and commercial buildings. Automation of residential and commercial buildings provides comfort, safety and conservation of resources and provides for the coordinated operation of the heating and air conditioning system, as well as control of factors that affect the need to turn on or off the relevant systems. The course reveals the interdisciplinary links on the basis of which modern buildings are designed and constructed, which allows at the initial design stage to achieve optimal performance and increase energy efficiency.

Estimate and contractual documentation. The purpose of teaching the discipline is to form in applicants for higher education a set of theoretical knowledge and practical skills in the field of budgeting and contractual documentation, which they can use in future professional activities.

Economics of innovation in construction. Provides the formation of higher education students a set of theoretical knowledge and practical skills in the field of innovation economics, which they can apply in future professional activities for the effective implementation of the innovation component and finding optimal solutions.

Industrial nanomaterials and nanotechnologies. The course "Industrial nanomaterials and nanotechnologies" is a complex discipline that involves students gaining theoretical knowledge and practical skills in the science of methods of obtaining nutrients and methods of their physical and chemical analysis, studying their structure and properties of technology, efficiency, structural, physical, chemical and toxicological aspects of safety of materials and processes of the nanoindustry, as well as technical and technological support for the production of nanoproducts.

3-d printing in construction technology. The discipline allows to reveal the possibilities of 3D printing technologies in order to increase the productivity of construction works and ensures safe operation. The discipline is directly related to the creation of 3D models of building models and their manufacture using a 3D printer, the structure and principle of operation of the 3D printer. Model design and subsequent 3D printing allows you to make prototypes of models and objects for further completion in a short time.

Educational and research program of master's training

(to choose from 6 disciplines in one of the sub-blocks)

Scientific bases of the theory of reliability and risks in construction. To give knowledge about legal, organizational and methodical bases of the theory of reliability of houses and risks of innovative activity and innovative engineering technologies in agricultural construction.

Scientific hypotheses and their experimental testing in construction. The discipline is the theoretical basis of the set of knowledge and skills on the basis of which the future specialist will solve professional problems of conducting scientific research in the field of construction and acquires knowledge about the actual work of building structures, relevant properties of building materials, learns to create and apply real scientific substantiated calculation scheme of a building or structure, acquires skills in the sequence of scientific research in the construction industry and their analysis.

Mechatronic systems in construction. Teaching theoretical foundations and principles of construction of mechatronic systems in construction. Theoretical bases of construction of mechatronic systems, methods of their control and automatic means of realization of mechatronic systems in agricultural construction.

Construction robotics. Robotization replaces the hard work of builders with intelligent machines, increases productivity and quality of construction work, safety at construction sites and conservation of material and energy resources, as well as ensures the smooth operation of the entire construction complex. Knowledge of theoretical principles for the implementation of robotic systems in construction production plays an important role in the formation of a modern civil engineer. The course reveals the interdisciplinary connections on the basis of which modern buildings are designed and created using robots.

Automation of residential and commercial buildings. Automation of residential and commercial buildings provides comfort, safety and conservation of resources and provides for the coordinated operation of the heating and air conditioning system, as well as control of factors that affect the need to turn on or off the relevant systems. The course reveals the interdisciplinary links on the basis of which modern buildings are designed and constructed, which allows at the initial design stage to achieve optimal performance and increase energy efficiency.

Estimate and contractual documentation. The purpose of teaching the discipline is to form in applicants for higher education a set of theoretical knowledge and practical skills in the field of budgeting and contractual documentation, which they can use in future professional activities.

Economics of innovation in construction. Provides the formation of higher education students a set of theoretical knowledge and practical skills in the field of innovation economics, which they can apply in future professional activities for the effective implementation of the innovation component and finding optimal solutions.

Industrial nanomaterials and nanotechnologies. The course "Industrial nanomaterials and nanotechnologies" is a complex discipline that involves students gaining theoretical knowledge and practical skills in the science of methods of obtaining nutrients and methods of their physical and chemical analysis, studying their structure and

properties of technology, efficiency, structural, physical, chemical and toxicological aspects of safety of materials and processes of the nanoindustry, as well as technical and technological support for the production of nanoproducts.

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FACULTY OF MECHANICS-TECHNOLOGY

Dean – Doctor of Technical Science, Professor Vyacheslav V. Bratishko
Tel.: (044) 527-85-34
E-mail: mtf11k@ukr.net
Location: building № 11, room 334

Faculty organizes and coordinates educational process of master training in educations programs within specialties:

Specialty 208 "Agricultural Engineering"

Educational program "Agricultural Engineering"

Guarantor of the educational and professional program – Doctor of Technical Science, Professor Vyacheslav V. Bratishko.

Guarantor of the educational and research program - Doctor of Technical Science, Professor Hennadii A. Holub.

Departments in charge of graduate training:

Occupational Health and biotechnical systems in animal husbandry
Tel.: (044) 527-85-35
E-mail: mechaniz_chair@twin.nauu.kiev.ua
Head – Doctor of Technical Science, Professor Vasyl S. Khmelyovskiy

Technical service and engineering management of them M.P. Momotenko
Tel.: (044) 527-88-53
E-mail: rogovskii@nubip.edu.ua
Head – Doctor of Technical Science, Professor Ivan L. Rohovskyi

Agricultural machinery and systems engineering them. Acad. P.M. Vasilenko
Tel.: (044) 527-85-37
E-mail: _sgms@ukr.net
Head – PhD, Yuriy O. Gumenyuk

Tractors, cars and bioenergy resources
Tel.: (044) 527-88-95
E-mail: kalininhntusg@gmail.com
Head – Doctor of Technical Sciences, Kalinin Yevhen I.

Specialty 274 "Automobile Transport"

Educational program "Automobile Transport"

Guarantor of the educational and professional program – Doctor of Technical Science, Professor Valeriy D. Voytyuk

The graduating department:

Transport technology and tools in agriculture
Tel.: (044) 527-86-32
E-mail: ttnubip@ukr.net
Head – PhD, Associate Professor Lilia A. Savchenko

Tractors, cars and bioenergy resources
Tel.: (044) 527-88-95
E-mail: kalininhntusg@gmail.com
Head – Doctor of Technical Sciences, Kalinin Yevhen I.

Technical service and engineering management of them. M.P. Momotenko
Tel.: (044) 527-88-53
E-mail: rogovskii@nubip.edu.ua
Head – Doctor of Technical Science, Professor Ivan L. Rohovskyi

Specialty 275 "Transport Technologies (by types)"

Educational program "Transport Technologies (by Automobile Transport)"

Guarantor of the educational and professional program – Doctor of Economics, Professor Oleg M. Zagursky.

Departments in charge of graduate training:
Transport technology and tools in agriculture
Tel.: (044) 527-86-32
E-mail: ttnubip@ukr.net
Head – PhD, Associate Professor Lilia A. Savchenko

Tractors, cars and bioenergy resources
Tel.: (044) 527-88-95
E-mail: kalininhntusg@gmail.com
Head – Doctor of Technical Sciences, Kalinin Yevhen I.

Technical service and engineering management of them. M. P. Momotenko
Tel.: (044) 527-88-53
E-mail: rogovskii@nubip.edu.ua
Head – Doctor of Technical Science, Professor Ivan L. Rohovskyi

Training of masters of sciences
branch of knowledge 20 "Agricultural science and food "
in specialty 208 "AGRICULTURAL ENGINEERING"
in educational program "AGRICULTURAL ENGINEERING"

Form of Training:	Licensed number of persons:
– Full-time	200
– Part-time	125
Duration of training:	
– Full-time educational and professional program	1 year 4 months
– Full-time educational and research program	1 year 10 months
– Part -time	1 year 4 months
Credits ECTS:	
– educational and professional program	90
– educational and research program	120
Language of training	Ukrainian, English, German
Qualification of graduates:	Master in Agroengineering

The concept of training

Providing knowledge and skills specialist new generation of innovation in the field of agricultural mechanization and agro-industrial facilities conservation systems based on modern standards of education adapted to the requirements of the world's best educational programs for the public and private sectors of Ukraine's economy.

Educational and professional program of master's training

Optional Block "Technology and machinery in crop production"

Optimization of complexes of machines and equipment under modern technologies of cultivation of agricultural crops on plant mechanization. Design and organization of technological processes, research of reliability and reliability of constructions of machines and equipment.

Areas of employment of graduates

Obtained full higher education and can work in positions corresponding to the 4th qualification level according to the state classifier of professions: chiefs and masters of production sites; Chiefs of Changes; managers of small enterprises without management apparatus; engineer mechanics; engineers for diagnosing the technical condition of the machine-tractor park; engineer technologists; labor safety engineers.

Optional Block "Technology and machinery in animal husbandry"

Optimization of complexes of machines and equipment under modern technological processes on mechanization of livestock and poultry industry. Research of reliability and reliability of constructions of machines and equipment.

Areas of employment of graduates

Obtained full higher education and can work in positions corresponding to the fourth qualification level according to the state classifier of professions: chiefs and masters of production sites; Chiefs of Changes; managers of small enterprises without management apparatus; engineer mechanics; engineers for diagnosing the technical condition of machinery and equipment for animal husbandry; engineer technologists; labor safety engineers.

Optional Block "Optimization of parameters, processes and operating modes of the APC"

Increasing the level of reliability of agricultural machinery on the basis of structural analysis of its reliability and rationale of rational technological processes, parameters and operating modes. Research and design of technological and kinematic schemes, aggregates, nodes, working bodies.

Areas of employment of graduates

Obtained full higher education and can work in positions corresponding to the 4th qualification level according to the state classifier of professions: pedagogical, scientific research and organizational and managerial activity, in research departments of enterprises, scientific research and design institutions, as well as in higher educational establishments at the positions of heads of industrial divisions in industry; chiefs and masters of production sites; Chiefs of Changes; Heads of the laboratory (education); heads of student research bureaus; heads of practice, heads of research laboratories; researcher; engineer mechanics; assistants and teachers of higher educational establishments.

Educational and research program of master's training

Research of working processes of agricultural machinery, on the basis of structural analysis of its reliability and rationale of rational technological processes, parameters and operating modes. Research and design of technological and kinematic schemes, aggregates, nodes, working bodies.

Areas of employment of graduates

Obtained full higher education and can work in positions corresponding to the 4th qualification level according to the state classifier of professions: pedagogical, scientific research and organizational and managerial activity, in research departments of enterprises, scientific research and design institutions, as well as in higher educational establishments at the positions of heads of industrial divisions in industry; chiefs and masters of production sites; Chiefs of Changes; Heads of the laboratory (education); heads of student research bureaus; heads of practice, heads of research laboratories; researcher; engineer mechanics; assistants and teachers of higher educational establishments.

Practical training.

Through laboratory and practical classes, training, technology, research, and other pre-diploma practice areas: crops, livestock, technical service, conservation, processing and storage of plant products, technology, biodiesel, animal breeding, the development of mechanized methods of diagnosis and prevention animal diseases, with repair technology. g technology, test with. g technology and their legal significance, economics, accounting, marketing and management in the agricultural field of production and so on. These databases are: Ukrainian Scientific Research Institute of forecasting and test equipment and technologies for agricultural production to them. Leonid burned "; National Scientific Center "Institute of Mechanization and Electrification of Agriculture"; JSC "Agriculture"; PJSC "Rayahrotehservis"; PDP AF "Concord-Agro", JV Agricultural firm "Dream"; LLC "Concern" SIMEKS-Agro "(Vinnitsa region.) Other bases of practical training of students (students) University from among leading institutions, enterprises, organizations of any ownership in Ukraine and abroad, with appropriate conditions for students according practice the requirements of education and professional training programs.

Proposed Topics for Master qualification Theses

1. Research constructive scheme and justification count parameters group milk yield.
2. Study the basic parameters and system design of parallel driving machine and tractor units.
3. Analysis of statistical processing parameter flow refuse and improvement process of repair tractors.
4. Study process parameters and settings for processing soybean seeds rotating thermal camera type.
5. Investigation of complex machines and determine their optimal composition for growing and harvesting of winter wheat.
6. Research the operational performance of the machine with the tractor units when using fuels of vegetable origin.
7. Research and design of computer technology biodiesel production process of improvement cavitation mixing reagents.
8. Research Feeds major damage to the development process of their elimination.
9. Research damaged parts wheel gearboxes combine harvesters and development process of recovery.

Curriculum of Master training in educational program "Agricultural Engineering" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Legislation and Law in agriculture	4	exam
CC 2	Basics of scientific research and intellectual property	4	exam
CC 3	Agrarian Policy	5	exam
CC 4	Business Foreign Language	5	exam
CC 5	Economy of technological systems	4	exam
Total		**22**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 6	Mechatronic system engineering APC	5	exam
CC 7	Precision Agriculture	5	exam
CC 8	Occupational Health	4	exam
CC 9	Internship	21	test
CC 10	Preparation and defense of master's qualification thesis	9	
Total		**44**	
Optional components of EPP			
Free choice according to specialty			
Optional Block 1 "Technology and machinery in crop production"			
OC 1.1	Design and calculation systems in crop	4	exam
OC 1.2	Innovative engineering technologies	4	exam
OC 1.3	Designing processes in plant	4	exam
OC 1.4	Process control in crop	4	exam
Total		**16**	

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
Optional Block 2 "Technology and machinery in animal husbandry"			
OC 2.1	Design and calculation of technological systems in animal husbandry	4	exam
OC 2.2	Ecological security processes	4	exam
OC 2.3	Designing processes in livestock	4	exam
OC 2.4	Process control in livestock	4	exam
Total		**16**	
Optional Block 3 "Optimization of parameters, processes and operating modes of the APC"			
OC 3.1	Simulation of working processes of machines	4	exam
OC 3.2	Logistics in mechanization of agriculture	4	exam
OC 3.3	Designing processes and modes of technology APC	4	exam
OC 3.4	Testing of agriculture technology	4	exam
Total		**16**	
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Legislation and Law in agriculture. Provide students with a complete summary of the main problems of law and law in agriculture at the objective, ideologically unbiased contemporary vision of modern science, synthesis of acquired knowledge in professional and humanities disciplines in a holistic outlook to provide a framework and methodological training masters humanitarian components.

Basics of scientific research and intellectual property. Raising general theoretical and practical engineering of future masters and researchers by mastering the basics of theoretical knowledge and practical skills on the general concept of experimental methods.

Agrarian policy. This discipline acquaints future professionals with the basics of policy in the agricultural sector, makes it possible to master methodical and methodological basis for development and implementation of measures to support and ensure the development of agriculture in the system of linkages in the national economy, and assess from the perspective of the theory of practical action government agencies on regulation of the agricultural production of the country.We study both domestic and foreign experience. As a result of learning students get the opportunity on a professional basis to form their own opinion about the processes and phenomena occurring in the agricultural sector of the state.

Business Foreign Language. Acquiring knowledge, skills and abilities necessary to ensure that masters communicative ability in the fields of professional communication.

Economy of technological systems. Is to explore relations in the middle of technological systems, skills planning, pricing and investment, definition of efficiency of operation.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Mechatronic system engineering agribusiness. Teaching theoretical foundations and principles of mechatronic systems agricultural machines. Theoretical bases of

mechatronic systems, methods for their control and automatic means of implementing mechatronic systems with-machines.

Precision agriculture. Discipline forms the students knowledge of the scientific basis for the development of best practices and organization of mechanized crop production based on modern information technology. Discipline reveals the ways and methods of solving pressing problems highly efficient use of agricultural machinery in the field using variable technology standards (doses) introducing technological materials based on global positioning satellite systems. There is a formation specialists with the ability to choose the best technologies of growing crops with minimal materials and energy and the preservation of soil fertility and the environment.

Occupational Health. The educational discipline, which describes the organizational principles for the development and implementation of the management system of labor protection in the agrarian sector and at the enterprises of agrarian and industrial complex, organizational measures for control of the state of labor protection in agricultural production.

Optional components of EPP

Free choice according to specialty

Optional Block 1 "Technology and machinery in crop production"

Design and calculation of technological systems in crop production. Provide scientific principles and train future engineers (professional master) to design and calculate crop technology system.

Innovative engineering technologies Examines theoretical and organizational bases of innovative engineering technologies. Consider their regulatory and technical support and legal laws in innovative technologies.

Designing processes in plant. Teaching students basic provisions in the village of Gd engineering, including design process of modern engineering systems in agriculture. Providing justification for calculating and designing technological requirements for components and assemblies cars.

Process control in crop. Receive future specialists in agricultural mechanization necessary knowledge systems of advanced mechanized production lines and processes of crop production.

Optional Block 2 "Technology and machinery in animal husbandry"

Design and calculation of technological systems in animal husbandry. Formation of professional knowledge of students on general and specific issues managing large technical systems on the example of operation of machines and equipment for livestock logistics system.

Ecological security processes. Raising general theoretical and practical engineering of future mechanical engineers by mastering the basics of theoretical knowledge and practical skills on environmental safety processes ahrobioinzheneriyi and environment in terms of resource saving natural resources.

Design processes in livestock. Teaching students the basic provisions of c-d design, including the reconstruction of livestock enterprises and the design process of modern engineering systems in animal husbandry. Providing justification for calculating and designing technological requirements for areas of machinery and equipment.

Process control in livestock. Receive future specialists in agricultural mechanization necessary knowledge systems of advanced mechanized production lines and processes of livestock production.

Optional Block 3 "Optimization of parameters and modes of technology APC"

Simulation of working processes of machines. Formation of professional knowledge of models and modeling business processes and machines, types of models and key stages of modeling, theoretical and practical methodological foundations, methods and objects object modeling of technological processes of production, economic and mathematical models and simulation processes and mechanisms for agriculture machines using a personal computer.

Logistics in the mechanization of agriculture. Raising general theoretical and practical level mechanical engineer of agricultural production by mastering basic theoretical principles and practical skills of logistics concepts to ensure the movement of agricultural products to the consumer.

Design modes, processes and technology APC. Formation of professional knowledge of students on general and specific issues managing large technical systems on the example design modes, process and technology of agriculture.

Testing of agricultural machinery. Raising general theoretical and practical research of future professionals through the assimilation of the foundations of theoretical knowledge and practical skills on general concepts and methods for testing of agricultural machinery.

Curriculum of Master training in educational program "Agricultural Engineering" (educational and research program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of ERP			
CC 1	Basics of scientific research and intellectual property	5	exam
CC 2	Regulatory policy in agricultural engineering	4	exam
CC 3	Applied computer technologies in scientific research	5	exam
CC 4	Technical foreign language	4	exam
CC 5	Scientific principles of labor protection and environmental safety	5	exam
Total		**23**	
Optional components of ERP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of ERP			
CC 6	Scientific foundations of agricultural engineering management	5	exam
CC 7	Scientific foundations of mechatronic systems	5	exam
CC 8	Scientific basis of precision farming systems	5	exam
CC 9	Modeling Smart technologies in agricultural production	5	exam
CC 10	Renewable energy in agricultural production	5	exam
CC 11	Scientific basis of agricultural technology testing	5	exam
CC 12	Simulation of working processes of machines	5	exam
CC 13	Research (scientific) practice	21	test
CC 14	Preparation and defense of master's qualification thesis	9	
Total		**65**	
Optional components of ERP			
Free choice according to specialty			

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
Optional block 1			
OC 1.1	Scientific basis of bioenergy conversion	4	exam
OC 1.2	Scientific basis of composting engineering	4	exam
OC 1.3	Modeling the human-machine-animal system	4	exam
OC 1.4	Modeling of bioenergetic processes	4	exam
OC 1.5	Modeling of agroengineering systems in crop production	4	exam
OC 1.6	Modeling of agroengineering systems in animal husbandry	4	exam
Total		**24**	
Optional block 2			
OC 2.1	Measurement methods in scientific research	4	exam
OC 2.2	Management of technological processes in crop production	4	exam
OC 2.3	Management of technological processes in animal husbandry	4	exam
OC 2.4	Modeling of logistics systems in agricultural production	4	exam
OC 2.5	Scientific foundations of biogas technologies	4	exam
OC 2.6	Scientific basis of engineering of biological preparations	4	exam
Total		**24**	
The total amount of compulsory components		**88**	
The total amount of optional components		**32**	
THE TOTAL AMOUNT OF ERP		**120**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of ERP

Basics of scientific research and intellectual property. The discipline forms the ability to carry out scientific and applied research for the creation of new and improvement of existing technological systems for agricultural purposes, the search for optimal methods of their operation, as well as the ability to apply the methods of similarity theory and dimensional analysis, mathematical statistics, theory of mass service, system analysis to solve complex tasks and problems of agricultural production. It provides the ability to choose a topic and form scientific research tasks, develops the ability to use the regulatory and legislative framework for the purpose of legal protection of intellectual property objects that are being developed and are in economic circulation.

Regulatory policy in agricultural engineering. The discipline forms the ability to use the regulatory and legislative framework for the purpose of managing processes in agricultural production, in the study, modeling, design and operation of agroengineering systems, the ability to obtain and analyze information on trends in the development of agricultural sciences, technologies and techniques in agro-industrial production, the ability to use managerial aspects within the framework of the problem of agricultural production and to guarantee environmental safety in agricultural production.

Applied computer technologies in scientific research. The discipline forms the ability to apply modern information and computer technologies when modeling the working bodies of machines, experimental research and statistical processing of experimental results.

Technical foreign language. The discipline forms the ability to use a foreign language, namely: reading, listening, speaking. Forms the skills of dialogic and monologic speech and prepares VO students for professional communication in oral and written forms in a foreign language. Provides mastery of the skills of translating special texts as a means of adequately presenting the content of scientific information and forms knowledge,

skills and abilities that provide the necessary communicative ability in the field of professional communication, in particular, the ability to give a scientific report, hold a business meeting or negotiate with foreign colleagues and partners.

Scientific principles of labor protection and environmental safety. The discipline forms the ability to comprehensively implement organizational, managerial and technical measures to create safe working conditions for workers in the agricultural sector and the ability to guarantee environmental safety in agricultural production due to the organizational principles of the development and implementation of the occupational safety and environmental safety management system in the agricultural industry and at enterprises of the agricultural sector, organizational measures to control the state of labor protection in agricultural production**.**

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of ERP

Scientific foundations of agricultural engineering management. The discipline forms the ability to solve optimization problems and make effective decisions on the use of machines and equipment in crop production, animal husbandry, storage, primary processing and transportation of agricultural products, and the ability to forecast and ensure the technical readiness of agricultural equipment.

Scientific foundations of mechatronic systems. The discipline forms the ability to integrate knowledge of mechanics, electronics, computer control, information technologies, and microelectronics into the design and use of mechatronic systems of machines and equipment of rural areas. production

Scientific basis of precision farming systems. The discipline forms the ability to organize the processes of agricultural production based on the principles of systems of precision agriculture, resource conservation, optimal use of nature and nature protection; use agricultural machines and power tools adapted for use in the system of precision agriculture. Reveals ways and methods of solving actual problems of highly efficient use of equipment in field conditions using technologies of variable rates of application of technological materials based on global satellite positioning systems. Forms the ability of students to choose optimal technologies for growing agricultural crops with minimal consumption of materials and energy and preserving the fertility of soils and the environment.

Modeling Smart technologies in agricultural production. The discipline forms the ability to model, design, and operate technologies and technical means of production, primary processing, storage, and transportation of agricultural products, the ability to use methods of management and planning of material and related information and financial flows to increase the competitiveness of enterprises. In addition, the discipline forms the ability to obtain and analyze information on trends in the development of agricultural sciences, technologies and techniques in agro-industrial production and the ability to use modern principles, standards and methods of quality management, to ensure the competitiveness of technologies and machines in the production of agricultural crops, the ability to use management aspects in within the limits of the problem of agricultural production.

Renewable energy in agricultural production. The discipline forms the ability to research, model, design and operate technical systems of agricultural production using renewable energy sources. In addition, it forms professional knowledge about renewable energy sources and bioenergy systems, theoretical, practical and methodological foundations, methods and objects of bioenergy in agricultural production, the ability to use management aspects within the scope of the problem of agricultural production.

Scientific basis of agricultural technology testing. Increasing the general educational theoretical and practical research level of future specialists by mastering the basics of theoretical knowledge and practical skills on issues of general concepts and methods for testing agricultural machinery.

Simulation of working processes of machines. The discipline forms the ability to use modern methods of modeling technological processes and systems to create models of mechanized technological processes of agricultural production. In addition, it forms professional knowledge about models and simulation of working processes of machines, types of models and the main stages of modeling, theoretical and practical methodological foundations, methods and objects of the subject of modeling technological processes of production, economic and mathematical models and working processes of agricultural production machines.

Optional components of ERP

Free choice according to specialty

Optional block 1

Scientific basis of bioenergy conversion. The discipline forms the ability to research, model, design and operate technical systems of bioenergy conversion in agricultural production. In addition, it forms professional knowledge about the principles of bioenergy conversion in agricultural production, forms theoretical, practical and methodological bases, methods and objects of bioenergy conversion in agricultural production, the ability to use modern methods of modeling technological processes and systems to create models of mechanized technological processes of agricultural production, the ability to use methods of management and planning of material and related information and financial flows to increase the competitiveness of enterprises, the ability to use modern principles, standards and methods of quality management, to ensure the competitiveness of technologies and machines in the production of agricultural crops, the ability to use management aspects within the scope of the activity problem agricultural production.

Scientific basis of composting engineering. The discipline forms the ability to research, model, design and operate technical composting systems in agricultural production. In addition, it forms professional knowledge about the principles of composting in agricultural production, forms theoretical, practical and methodological bases, methods and objects of composting in agricultural production, the ability to use management aspects within the scope of the problem of restoring soil fertility in agricultural production.

Modeling the human-machine-animal system. The discipline forms the ability to research, model, design and operate technical systems "man-machine-animal" in agricultural production. Forms professional knowledge about the principles of operation of the "man-machine-animal" system in agricultural production, forms theoretical, practical and methodological foundations, methods and objects of the "man-machine-animal" system in agricultural production, the ability to solve optimization problems and make effective decisions on the use of machines and equipment in animal husbandry, storage, primary processing and transportation of agricultural products, the ability to use management aspects within the framework of the problem of the functioning of such systems.

Modeling of bioenergetic processes. The discipline forms the ability to research, model, design and exploit bioenergy processes in agricultural production. Forms professional knowledge about the principles of functioning of bioenergy processes in agricultural production, forms theoretical, practical and methodological foundations, methods and objects of bioenergy processes in agricultural production, the ability to use

management aspects within the framework of the problem of the functioning of such processes.

Modeling of agroengineering systems in crop production. The discipline forms the ability to research, model, design and operate agroengineering systems in crop production. Forms professional knowledge about the principles of operation of agroengineering systems in crop production, forms theoretical, practical and methodological foundations, methods and objects of agroengineering systems in crop production, the ability to use methods of management and planning of material and related information and financial flows to increase the competitiveness of enterprises , the ability to use management aspects within the framework of the problem of functioning of such systems.

Modeling of agroengineering systems in animal husbandry. The discipline forms the ability to research, model, design and operate agroengineering systems in animal husbandry. Forms professional knowledge about the principles of operation of agroengineering systems in animal husbandry, forms theoretical, practical and methodological foundations, methods and objects of agroengineering systems in animal husbandry, the ability to use methods of management and planning of material and related information and financial flows to increase the competitiveness of enterprises , the ability to use management aspects within the framework of the problem of functioning of such systems.

Optional block 2

Measurement methods in scientific research. The discipline forms the ability to apply modern information and computer technologies to solve professional tasks using methods, rules and instructions of measuring tools in research work.

Management of technological processes in crop production. The discipline forms the ability to research, model, design and manage technological processes in crop production. Forms professional knowledge about the principles of the functioning of technological processes in crop production, forms theoretical, practical and methodological bases, methods and objects of technological processes in crop production, the ability to use management aspects within the limits of the problem of the functioning of such processes.

Management of technological processes in animal husbandry. The discipline forms the ability to research, model, design and manage technological processes in animal husbandry. Forms professional knowledge about the principles of the functioning of technological processes in animal husbandry, forms theoretical, practical and methodological bases, methods and objects of technological processes in animal husbandry, the ability to use management aspects within the limits of the problem of the functioning of such processes.

Modeling of logistics systems in agricultural production. The discipline forms the ability to design, manufacture and operate technologies and technical means of production, primary processing, storage and transportation of agricultural products, the ability to use methods of management and planning of material and related information and financial flows to increase the competitiveness of enterprises.

Scientific foundations of biogas technologies. The discipline forms the ability to research, model, design and exploit biogas technologies in agricultural production. Forms professional knowledge about the principles of functioning of biogas technologies in agricultural production, forms theoretical, practical and methodological foundations, methods and objects of biogas technologies in agricultural production, the ability to use management aspects within the framework of the problem of the functioning of such technologies.

Scientific basis of engineering of biological preparations. The discipline forms the ability to research, model, design and operate engineering systems for the production and use of biological preparations in agricultural production. Forms professional knowledge about the principles of the functioning of engineering systems for the production and use of biological preparations in agricultural production, forms theoretical, practical and methodological foundations, methods and objects of engineering systems for the production and use of biological preparations in agricultural production, the ability to use management aspects within the limits of the problem of the functioning of such technologies.

Training of masters of sciences
branch of knowledge 27 "Transport"
in specialty 274 "AUTOMOBILE TRANSPORT"
educational program "AUTOMOBILE TRANSPORT"

Form of Training: – Full-time	Licensed number of persons: 50
Duration of training – Full-time educational and professional program	1 year 4 months
Credits: – educational and professional program	90 ECTS
Language of training	Ukrainian, English, German
Qualification of graduates:	Master in Automobile Transport

The concept of training

Design freight motor means and loading and unloading operations in the production of agricultural products. The objects of research are the specificity and diversity of agricultural goods, the terms and conditions of carriage of cargo flows on short, medium and long distances.

Areas of employment for graduates

Receives higher education and can work in positions that correspond to the fourth qualification level according to the State classifier professions: dispatchers, engineers traffic service and logistic department managers trucking companies; transport department managers of large corporations; Specialist of road transport and infrastructure; engineers control department of the State Automobile Inspectorate; research staff research and design institutes transport profile; teachers in driving schools, secondary professional and higher education.

Practical training

It is carried out through laboratory and practical classes, educational, technological, research, pre-diploma and other practices in the field of motor transport. Such bases are: Ukrainian Research Institute for forecasting and testing of technology and technology for agricultural production to them. Leonid Pogorelyi "; National Science Center "Institute of Mechanization and Electrification of Agriculture"; OJSC "Agricultural Technologies"; PJSC "Raihrohtekhservis"; PP Concord-Agro AF; STOV Agrofirma "Mriya"; Concern Simex-Agro LLC (Vinnitsa region), other bases of practical training of students (students) of the university from among the leading institutions, enterprises, organizations of any form of ownership in Ukraine and abroad, with appropriate conditions for the practice of students respectively to the requirements of educational and professional training programs.

Proposed Topics of master's qualification thesis

1. Study of technical and economic parameters of an automobile by an effective implementation of logistic approaches.
2. Improve handling for transportation of vegetable-fruit groups transport system in the agricultural company.
3. Improvement of transport and production process of grain at harvest using variables bodies.
4. Justification transport and production process at harvesting corn.
5. Improvement of transport and traffic during the production process of dairy products in the Kiev region.

6. Justification transport and production process in making organic fertilizers.

7. Study of the main indicators of road transport and their improvement Ltd. "Ray" Kyiv region

8. Improving transport and process the transport of sugar beet in agricultural farm.

9. Improving transport and production process at transportation fertilizers in LLC "Torch" Vinnitsa region.

10. Improving transport and logistics processes during transportation of fruits and berries in agricultural farm.

Curriculum of Master training in educational program "Automobile Transport " (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Applied Computer Technologies in Automobile Transport	4	exam
CC 2	Occupational safety in motor transport	6	exam
CC 3	Engineering management in road transport	4	exam
Total		**14**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 4	Scientific basis of technical operation of machines	6	exam
CC 5	Tests of cars and engines	4	exam
CC 6	Design and calculation of autoservice enterprises	4	exam
CC 7	Modern methods of MOT and diagnostics of automobiles	4	exam
CC 8	Management of motor transport enterprises	4	exam
CC 9	Internship	21	test
CC 10	Preparation and defense of master's qualification thesis	9	
Total		**52**	
Optional components of EPP			
Free choice according to specialty			
OC 1	Methodology and organization of scientific research on the basics of intellectual property	4	exam
OC 2	Organization and safety of motor transport	4	exam
OC 3	Transport technologies in agrarian production	4	exam
OC 4	Operational properties of cars	4	exam
OC 5	Hybrid and electric cars	4	exam
OC 6	Adaptive technologies in technical operation of cars	4	exam
OC 7	Monitoring of efficient operation of cars	4	exam
OC 8	Technology of scientific research of motor transport	4	exam
OC 9	Modern car performance management systems	4	exam
OC 10	Technologies and methods of vehicle storage	4	exam
OC 11	Navigation systems on vehicles	4	exam
Total		**16**	
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Applied Computer Technologies in Automobile Transport. Teaching of theoretical foundations and principles of constructing algorithms and mechatronic systems of machines. Theoretical bases of automation in the management of motor transport and automatic means of realization of mechatronic systems of automobiles.

Occupational safety in motor transport. Improvement of the general theoretical and practical engineering level of future engineers of transport by mastering the theoretical knowledge and practical skills on the issues of environmental safety of technological processes of transport and environment in the conditions of resource-saving nature use.

Engineering management in road transport. The formation of modern management thinking, the basics of system management of organizations of any kind - making adequate management decisions at the future workplace. Formation of knowledge of theoretical foundations and practical skills in management and marketing in transport students.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Scientific bases of technical operation of machines. To deepen the master's knowledge of theoretical material about the basic laws of nature, on the basis of which they create calculation schemes necessary in engineering, but also as a means of educating future specialists in the skills of scientific generalizations.

Tests of cars and engines. Increasing the general theoretical and practical research level of future specialists by mastering the theoretical knowledge and practical skills on general concepts and methods for testing vehicles and engines.

Design and calculation of autoservice enterprises. Increasing the general theoretical and practical research level of future specialists by mastering the foundations of theoretical knowledge and practical skills on general concepts and methods of designing and calculating autoservice enterprises.

Modern methods of MOT and diagnostics of automobiles. In the curriculum the discipline provides for the study of theoretical and practical issues related to the reliability and effective management of enterprises and units of technical service of machines, their interaction with manufacturers, the scope of providing services in the conditions of seasonal maintenance of motor transport, a wide range of nomenclature of machines, their technical state for the purpose of efficient usetechnology, labor and socio-economic resources.

Management of motor transport enterprises. Formation of professional knowledge of students on the general and specific issues of management of large automobile enterprises, for example, the operation of machines and equipment of service enterprises, logistics of automobile parks.

Optional components of EPP
Free choice according to specialty

Methodology and organization of scientific research on the basics of intellectual property. Raising general theoretical and practical engineering of future masters and researchers by mastering the basics of theoretical knowledge and practical skills on the general concept of experimental methods.

Organization and safety of motor transport. Studying the theoretical and organizational foundations of innovative automotive technologies. Consider their normative and technical support and legal legal acts on the organization of motor transport.

Transport technologies in agrarian production. Getting future specialists in the field of automobile industry the necessary knowledge of the system of the newest mechanized technological lines and processes of application of motor transport.

Operating properties of cars. Increasing the general educational theoretical and practical level of a mechanical engineer of agricultural production by mastering the main theoretical provisions and practical skills from the logistical concept of ensuring the movement of agricultural products to the consumer.

Hybrid and electric cars. Study of the use of systems "electric motor - internal combustion engine", "electric motor-transmission", their practical implementation in road transport technologies to reduce fuel consumption and harmful emissions.

Adaptive technologies in technical operation of cars. Training of a specialist capable of competently solving the issues of technical operation of cars and equipment in the conditions of enterprises. The subject of study is the methods of experimental determination and theoretical calculation of the main technical and operational indicators of road transport and complete equipment and their adjustment in the user's environment.

Monitoring of efficient operation of cars. Training of a specialist capable of competently solving the issue of car operation in production conditions. The subject of the study is flow mechanized technological processes of the use of road transport, methods of experimental determination and theoretical calculation of the main technical and operational indicators of cars and complete equipment and adjustment of their operation, under the conditions of the manufacturer.

Modern car performance management systems. The discipline forms the ability to use modern methods of managing technological processes of road transport. In addition, it forms professional knowledge about the performance of cars, for effective functioning in the processes of agricultural production.

Technologies and methods of vehicle storage. Students are provided with the basics of knowledge about the methods of storage of vehicles, preparing it for conservation with the use of modern technologies with minimal losses; to teach students to implement and find the most effective technologies and means of storage of motor transport.

Technology of scientific research of motor transport. Study of methods of scientific research of motor transport. Analysis of technological processes of work, units, aggregates and auxiliary equipment of cars.

Navigation systems on vehicles. The formation of students' sustainable knowledge in the field of using modern navigation systems and technologies, as well as the development of skills in creating databases using modern database management systems and data banks.

Training of masters of sciences in branch of knowledge 27 "Transport" in specialty 275 "TRANSPORT TECHNOLOGIES (BY TYPES)" educational program "TRANSPORT TECHNOLOGIES (BY AUTOMOBILE TRANSPORT)"

Form of Training:	Licensed number of persons:
– Full-time	30
– Part-time	30
Duration of training	
– Full-time educational and professional program	1 year 4 months
– Part-time	1 year 4 months
Credits:	
– educational and professional program	90 ECTS
Language of training	Ukrainian, English
Qualification of graduates:	Master in Transportation Technology

The concept of training

Providing knowledge and skills specialist new generation of innovation in the organization of traffic and transport management (road transport) and environmental facilities agroindustrial complexes based on modern standards of education adapted to the requirements of the world's best educational programs for the public and private sectors Ukraine.

Areas of employment for graduates

Receives higher education and can work in positions that correspond to the fourth qualification level according to the State classifier professions: dispatchers, engineers traffic service and logistic department managers trucking companies; transport department managers of large corporations; Specialist of road transport and infrastructure; engineers control department of the State Automobile Inspectorate; research staff research and design institutes transport profile; teachers in driving schools, secondary professional and higher education.

Practical training

Through laboratory and practical classes, training, technology, research, and other pre-diploma practice areas: crops, livestock, technical service, conservation, processing and storage of plant products, technology, biodiesel, animal breeding, the legal value, economy, accounting marketing and management in the field of agricultural production and so on. These databases are: John Deere Ukraine, Amaco Ukraine, Myronivsky ZVVK, Astra; Department district traffic police Internal Affairs of Ukraine MoU in (Kiev, Crimea, Cherkasy, Khmelnytsky, Chernihiv, Zhytomyr, Rivne, Volyn, Poltava, etc.) and the Office of Research Affairs of Ukraine traffic police in the regions; other bases of practical training of students (students) University from among leading institutions, enterprises, organizations of any ownership in Ukraine and abroad, with adequate conditions for practice of students in accordance with the requirements of education and professional training programs.

Proposed Topics of master's qualification thesis

1. Study of technical and economic parameters of an automobile by an effective implementation of logistic approaches.

2. Improve handling for transportation of vegetable-fruit groups transport system in the agricultural company.

3. Improvement of transport and production process of grain at harvest using variables bodies.

4. Justification transport and production process at harvesting corn.

5. Improvement of transport and traffic during the production process of dairy products in the Kiev region.

6. Justification transport and production process in making organic fertilizers.

7. Study of the main indicators of road transport and their improvement Ltd. "Ray" Kyiv region

8. Improving transport and process the transport of sugar beet in agricultural farm.

9. Improving transport and production process at transportation fertilizers in LLC "Torch" Vinnitsa region.

10. Improving transport and logistics processes during transportation of fruits and berries in agricultural farm.

Curriculum of Master training in educational program "Transport Technologies (by Automobile Transport)" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Occupational Health	4	exam
CC 2	Methodology of scientific research	4	exam
CC 3	Technical examination of traffic accidents	4	exam
Total		**12**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 4	Quality management of motor transport services	5	exam
CC 5	Organization of transport provision of rural areas	4	exam
CC 6	Modeling of complex transport processes and systems	4	exam
CC 7	Supply chain management	5	exam
CC 8	Freight forwarding activities	6	exam
CC 9	Internship	21	test
CC 10	Preparation and defense of qualification master's thesis	9	
Total		**54**	
Optional components of EPP			
Free choice according to specialty			
OC 1.1	Technical service vehicles	4	exam
OC 1.2	Performance properties of cars		
OC 2.1	Recycling vehicles	4	exam
OC 2.2	Transport technologies in agricultural production		
OC 3.1	Economics of transport and traffic	4	exam
OC 3.2	Management of motor transport enterprises		
OC 4.1	Information Technology in transport	4	exam
OC 4.2	Domestic roads		
Total		**16**	

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of subjects in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Occupational Health. Acquisition of skills to develop innovative organizational measures to prevent accidents, injuries and morbidity in the organization of transportation and management in the automotive industry.

Methodology of scientific research Improving the general theoretical and practical engineering level of future masters of transport by mastering the basics of theoretical knowledge and practical skills on the general concept of experimental methods of research on the organization of transportation and management in the automotive industry.

Technical examination of traffic accidents. Formation of skills that allow to make the right choice of methods of simulating the investigation of a crime according to a previously developed plot, more rationally determine the sequence of investigative actions, practices of detection, investigation and prevention of crimes, the mechanism of the event, disclosure of internal links and contradictions in the studied phenomena and facts of transport technologies.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Quality management of motor transport services. Obtaining knowledge that meets the current level in the field of quality management of vehicles, acquaintance with the main achievements in the theory and practice of quality management in different countries, the need to use achievements in quality management, its organizational systems, the need to move to production management "through quality" using international ISO 9000 series standards, which are accepted in Ukraine as national.

Organization of transport provision of rural areas. Disclosure of the essence and methods of developing a set of rules for full use of the potential of vehicles in rural areas, with the specific properties of the goods of the agro-industrial complex and natural production conditions, determining the need for these tools to achieve programmed results and compliance.

Modeling of complex transport processes and systems. Improving the general theoretical and practical research level of future specialists by mastering the basics of theoretical knowledge and practical skills on general concepts and techniques for modeling complex transport processes and systems.

Supply chain management. Mastering the theoretical foundations of supply chain management; acquaintance with the main business processes in supply chains; acquiring skills in designing and planning supply chains; study of the basics of creating a single information space for supply chain participants; acquaintance with the criteria of quality and efficiency of supply chains.

Freight forwarding activities. Formation of system knowledge and practical skills in freight forwarding activities by its types and forms, features of technological processes of freight forwarding services. In accordance with the methods of organization of transport and forwarding services, determination of parameters of transport and forwarding services;

perspective directions of further development of transport and forwarding service and determination of its efficiency.

Optional components of EPP

Free choice according to specialty

Technical service of vehicles. Providing knowledge on methods and means of maintaining the technical condition of the car, its units, systems and mechanisms, organizations for maintenance and repair of cars.

Performance properties of cars. Improving the general theoretical and practical level of mechanical engineer of agricultural production by mastering the basic theoretical principles and practical skills of the logistics concept to ensure the movement of agricultural products to the consumer.

Recycling vehicles. Disclosure of the methodology of designing recycling systems of different levels, the concept of recycling, the mechanism of organizational coordination, forms of interaction between organizations; be able to: develop a recycling system project, analyze the recycling environment, paint an algorithm for "problematic" formation of recycling systems, develop the organizational structure of the recycling system, identify and analyze business processes of the organization, use recycling principles to optimize the system.

Transport technologies in agricultural production. Obtaining future specialists in the field of automotive industry the necessary knowledge of the latest mechanized technological lines and processes of application of road transport.

Economics of transport and traffic. It consists in studying the relations within the technological systems, acquiring skills of planning, pricing and investing, determining the effectiveness of the organization of transportation and management in the automotive industry.

Management of motor transport enterprises. Formation of professional knowledge of students on general and specific issues of management of large automobile enterprises on the example of operation of machines and equipment of service enterprises, material and technical support of car parks.

Information technology in transport. Acquisition of knowledge, skills and abilities aimed at the creation and use of navigation subsystems, units and complexes of motor vehicles. Learning the basics of information analysis and synthesis of navigation systems in vehicles with the help of computer systems of different levels and purposes.

Domestic roads. Acquisition of skills to develop innovative organizational measures for the efficiency of operation and design of domestic roads, prevention of accidents, injuries and morbidity in the organization of transportation and management in the automotive industry.

FACULTY OF LIVESTOCK RAISING AND WATER BIORESOURCES

Dean – Kononenko Ruslan Volodymyrovych, Associated Professor, Candidate of Veterinary Science
Tel.: (044) 527-82-58
E-mail: animal_science_dean@nubip.edu.ua
Location: Building № 1, Room. 34

Faculty organizes and coordinates the educational process of master training in educations programs with in specialties:

Specialty 204 "Technology of production and processing of livestock products"

Educational program "Technology of production and processing of livestock products"
Guarantor of the educational and professional program – Mykhailo Sychov, Professor, Doctor of Agricultural Science Professor P.D.

Departments in charge of graduate training:
Genetics, Breeding and Biotechnology of animals
Tel.: (044) 527-82-30
E-mail: rubansy@gmail.com
Head of Department – Sergiy Ruban, Professor, Doctor of Agricultural Science Professor P.D.

Milk and Beef Production Technology
Tel.: (044) 527-83-93, (044) 527-82-32
E-mail: milkmeat_chair@nubip.edu.ua
Head of Department – Ugnivenko Anatoly, Professor, Doctor of Agricultural Science Professor P.D.

Pshenychnyi Department of Animal Nutrition and Feed Technology
Tel.: (044) 527-85-55
E-mail: feedinganimals_chair@nubip.edu.ua
Head of Department – Mykhailo Sychov, Professor, Doctor of Agricultural Science Professor P.D.

Beekeeping
Tel.: (044) 527-82-68
E-mail: k_pchela@ukr.net
Head of Department – Mykola Povoznikov, Professor, Doctor of Agricultural Science Professor P.D.

Technology in poultry, pig and sheep farming
Tel.: (044) 527-87-60, 527-84-78, 527-88-49
E-mail: **v**ylykhach80@nubip.edu.ua
Head of Department – Vadym Lykhach, Professor, Doctor of Agricultural Science.

Specialty 207 "Water Bioresources and Aquaculture"

Educational program "Water Bioresources and Aquaculture"

Guarantor of the educational and professional program – Nataliia Rudyk-Leuska, Associated Professor, Candidate of Biological Science.

Departments in charge of graduate training:

Aquaculture

Tel.: (044) 527-89-65

E-mail: aquaculture_chair@nubip.edu.ua

Head of Department – Vitaliy Bekh, Professor, Doctor of Agricultural Science,

Ichthyology and Hydrobiology

Tel.: (044) 527-86-83

E-mail: rudykleuska@nubip.edu.ua

Head of Department – Nataliia Rudyk-Leuska, Associated Professor, Candidate of Biological Science.

Training of masters of sciences in branch of knowledge "Agricultural science and food" in specialty 204 "TECHNOLOGY OF PRODUCTION AND PROCESSING OF LIVESTOCK PRODUCTS" educational program "TECHNOLOGY OF PRODUCTION AND PROCESSING OF LIVESTOCK PRODUCTS"

Form of Training:	Licensed number of persons:
– Full-time	90
– Part-time	60
Duration of Training:	
– Full-time educational and professional program	1 year and 4 months
– Part-time	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian
Qualification	Master's degree in the specialty “Technology of production and processing of livestock products”

The concept of training

The concept of Master’s degree training level 204 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.

Areas of employment of graduates

After training, specialists can work as managers, technologists and heads of various livestock enterprises, commercial firms, in breeding farms of the state and private sectors, regional and district agricultural administrations, agricultural and tribal associations of various levels, as well as in institutions of higher education and scientific institutions, as well as have the right to enter graduate school.

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 of Master's qualification Thesis

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.
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.

Curriculum of Master training in educational program "Technology of production and processing of livestock products" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Pedagogy and management of educational processes	4	exam
CC 2	Processing of products of animal origin	5	exam
CC 3	Business activity in livestock	4	exam
CC 4	Foreign language	4	exam
CC 5	Scientific activity in animal husbandry	4	exam
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 6	Biological productivity of farm animals	4	exam
CC 7	Animal nutrition and feed quality	4	exam
CC 8	Modern trends of selection in animal husbandry	4	exam
CC 9	Modeling of technological processes in animal husbandry	4	exam
CC 10	Process control in livestock	5	exam
CC 11	Production Practice	10	exam
CC 12	Certification exam	1	exam
CC 13	Preparation and defense of master's qualification thesis	9	
Optional components of EPP			
Free choice according to speciality			
OC 1	Scientific communication	4	exam
OC 2	Experimental research in animal husbandry	4	exam
OC 3	Research activity in the technology of production and processing of livestock products	4	exam
OC 4	Animal Nutrition Business	4	exam
OC 5	Bioethics, biosafety and well-being in animal husbandry	4	exam
OC 6	Biomethods of bee reproduction	4	exam
OC 7	Germ cell biotechnology	4	exam
OC 8	Biotechnology of animal physiological processes	4	exam
OC 9	Production of ecologically safe livestock products	4	exam
OC10	Genetics of quantitative and qualitative traits	4	exam
OC11	Genetic resources of animal husbandry	4	exam
OC12	Global Data Standards for Livestock	4	exam
OC 13	DNA technologies in animal husbandry	4	exam
OC 14	Effective sheep farming	4	exam
OC 15	Feeding ruminants	4	exam
OC 16	Nutrition of monogastric animals	4	exam
OC 17	Feeding companion animals	4	exam
OC 18	Fur farming as a business	4	exam
OC 19	Industrial pig farming	4	exam
OC 20	Innovative beekeeping technologies	4	exam
OC 21	Computer preparation of rations	4	exam
OC 22	Craft products of animal husbandry	4	exam
OC 23	Marker associated selection in animal husbandry (MAS)	4	exam
OC 24	Organization of breeding business in animal husbandry	4	exam
OC 25	Organic production of goat products	4	exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
OC 26	Designing pig enterprises	4	exam
OC 27	Service provision of livestock production	4	exam
OC 28	Sociobiology of the honey bee	4	exam
OC 29	Modern technologies of industrial poultry farming	4	exam
OC 30	Animals in Ukrainian and world culture	4	exam
OC 31	Cattle productivity management	4	exam
OC 32	Physiology of lactation	4	exam
Total		**20**	
The total amount of compulsory components		**62**	
The total amount of optional components		**28**	
THE TOTAL AMOUNT OFF EPP		**90**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Pedagogy and management of educational processes. Generates future specialists professional (general pedagogical) knowledge and skills that are in knowledge about the nature of learning, education and training, the main directions and principles, methods and forms of education and training, the principles of forming the content of education and training; approaches to evaluating the success of the training, skills characterize the organization of educational and training process.

Processing of products of animal origin. Students learn how to produce and process products of cattle, pigs, poultry, beefarming, sheep and goats, rabbits and fur farming**.**

Business activity in livestock. 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.

Scientific activity in animal husbandry. The aim of the discipline is formation of the system of knowledge in methodology, theory of method and research process, methodical support of scientific and research activity at the stages of preparation of a Master paper, formation of the ability to organize research of a specific issue using the whole complex of the traditional methods of research including general and special methods. The main task of the theoretical part of the course is introduction to students the current concepts of research creation, the principles of methodology of scientific perception and methods of research. The main task of the practical part is the development of self-education ability, mastering skills of formation and application of perceived methodological position of research. In case of mastering the course students have to improve their skills of search, assortment and processing of scientific information, accurate formulation of a problem, aim, task, object, subject, methods of research. Introduction to students the principles of intellectual property and direction of them to gain knowledge and skills concerning registration of rights of ownership, their protection, commercialization, estimation and management are envisaged.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

Animal productivity management. 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, aminoacids, 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.

Animal nutrition and feed quality. 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.

Modern trends of selection in animal husbandry. The objective of discipline is to help students to 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.

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.

Process control in livestock. The subject aims at highlighting the essence of process control as part of production technology and production management in livestock. It considers the basic principles of manufacturing processes in space and time, the stages of calculating the parameters of line production, principles of organization and planning workflows and system of "standard operating procedures" in various fields of animal husbandry. It reveals the basic approaches to operational process control in livestock systems in the context of "management based on deviations" and determine the critical control points in the processing chain, shows the basic structure and functionalities of modern automated process control systems.

Optional components of EPP

Free choice according to specialty

Scientific communication. A discipline aimed at studying the possibilities of exchanging scientific information (ideas, knowledge, messages) between scientists and specialists, as well as the skills of representing scientific knowledge to a wide audience.

During the study, the following types of scientific communication will be considered: direct connections - personal conversations, face-to-face scientific discussions, oral reports (personal networks); connections mediated by technical means of information replication – publication of books, scientific journals, abstract journals (mediated networks); mixed connections – scientific conferences, scientific and technical exhibitions (interactive networks). Different forms of official and unofficial contacts will be considered: addressed and non-addressed, formal and informal, interpersonal and impersonal, direct and indirect.

Experimental research in animal husbandry. A discipline that includes the study of the main directions of scientific research that determine scientific and technical progress in animal husbandry, the basics of designing an experiment, choosing the method of its setting, the principles of scientific methodology: objectivity, determinism, development, historicism, combining theory with practice, as well as methods conducting scientific work, methods of setting up experiments, analysis and evaluation of research results, registration of scientific work and invention rights.

Research activity in the technology of production and processing of livestock products. A discipline that studies the possibilities of complex research of production operations. Research in which the object is not only an agricultural animal, but also a technological process with a complete set of all elements from equipment to management issues. The discipline studies a complex of possible researches from the study of individual factors of the vital activity of the organism, the functioning of elementary nodal points of action in a single process of production of animal husbandry products, the process of interaction of various factors, groups of factors, factors of different nature and designing, on the basis of accumulated new scientific data, more advanced technological systems for the production of animal husbandry products and evaluating them in an experiment followed by testing in production conditions.

Animal Nutrition Business. The discipline is aimed at providing practical skills in the area of business activity and reveals the issues that shape the graduate's business literacy. During the study of the discipline, preparation for an interview, starting one's own business, and how to write one's own resume are considered. The current state of the fodder business in Ukraine and the world is also highlighted.

Bioethics, biosafety and well-being in animal husbandry. The purpose of the discipline is for students of higher education to acquire knowledge on modern problems of bioethics, biosafety, the concept of animal welfare, as well as mastering the practical orientation necessary for professional activity, the formation of a holistic view of the current state of bioethics, biosafety in Ukraine and the world, and the corresponding obligations in within the framework of the well-being of animals imposed on the owner, technologist for the production of animal husbandry products and persons who work or serve animals. The tasks of the discipline are aimed at creating the prerequisites for students of higher education to acquire the correct ideas, knowledge and/or skills regarding: the most important bioethical teachings, categories of moral consciousness, the use of animals by humans in agricultural production; the main sources of biological danger, their definition; conceptual approaches in ensuring biological safety in the field of animal husbandry; biotic aspects of experimental and laboratory research; regulatory framework of bioethics and biosafety for use in the professional activity of a technologist-researcher in the production and processing of animal husbandry products; formation and implementation of the animal welfare policy in order to ensure comfortable and safe conditions that meet their biological needs to reveal natural behavior, mental satisfaction, and increase productivity.

Biomethods of bee reproduction. It is aimed at studying the characteristics of variability and heredity of both individual individuals and the bee family; morphological and economically useful features of different breeds of bees; organization and carrying out of selection work in the industry; study of the theoretical foundations of the natural

reproduction of bee families and bee stasis and practical use, development and implementation based on this of modern technologies and methods in the breeding of bee families and the breeding of breeding material. Students of higher education acquire thorough knowledge, as well as skills and abilities in modern technologies of breeding and selection of bees.

Germ cell biotechnology. The discipline gives students of higher education the opportunity to familiarize themselves with the laws and rules of working with spermatozoa, eggs, embryos and stem cells. To master the basic methods of determining and forming embryos, methods of studying germ cells and micromanipulation over them. Students have the opportunity to master the basics of modern technologies based on the use of biological processes, to gain skills in working in a biotechnological laboratory in order to broaden their horizons and acquire knowledge and skills for organizing and conducting research related to the use of biotechnological methods.

Biotechnology of animal physiological processes. The discipline provides an opportunity to master the modern system of evaluation and analysis of the formation and dependence of the physiology of the reproductive function of animals in terms of physiological processes and their influence on the latter. Also to acquire theoretical and practical skills, which are necessary when solving issues of identifying the causes, mechanisms and patterns of animal reproduction. Students gain knowledge of the laws of physiological, metabolic and biochemical processes in the body of animals and their relationship with the reproductive function of animals.

Production of ecologically safe livestock products. The goal of the discipline is the formation of a complete system of theoretical knowledge in students regarding the control of compliance with the functioning of the production of livestock products, in accordance with legislative acts, standards, adopted management decisions, and the goals of the enterprise. The specialist will use the knowledge obtained as a result of studying the discipline to make management decisions regarding the coordination of the technological process of production of ecologically safe livestock products and the correction of deviations from the set goals during its implementation. Based on in-depth knowledge of the biological characteristics of livestock of specialized breeds, students will master the practice of obtaining cheap, ecologically safe and high-quality beef and milk from it.

Genetics of quantitative and qualitative traits. The discipline is aimed at studying the issues of pathogenetics, the inheritance of quantitative and qualitative traits of domestic animals and the polymorphism of genes that determine them. It reveals the methods of detection, assessment and use of polymorphism of genomes, genes and loci of quantitative traits in animal breeding of various species.

Genetic resources of animal husbandry. Students of higher education in this discipline receive a full range of knowledge and practical skills regarding the organization and methodology of breeding work with commercial (cross-border) and local breeds of the main types of agricultural animals.

Global Data Standards for Livestock. Graduates of higher education in this discipline receive a full range of modern analytical knowledge and practical skills regarding the organization of production processes in dairy and meat cattle breeding, goat breeding, sheep breeding based on the international requirements of ICAR, (from the English International Committee for Animal Recording animal accounting committee) and the International Non-Governmental Organization INGO (from the English Internation Non-Governmental Organization), which enables the rapid restructuring of production and its integration into the world space.

DNA technologies in animal husbandry. It is aimed at forming students' knowledge and practical skills in the application of modern molecular genetic methods for

animal identification, acceleration of the selection process, control of its course, population survey and other special research in animal husbandry.

Effective sheep farming. The discipline is aimed at studying the latest technologies for processing sheep products into competitive products, the system of formation of the domestic market of sheep products, its export potential and the mechanism of state support in modern conditions.

Feeding ruminants. The discipline is aimed at studying the digestion, absorption and use of nutrients by ruminants. It reveals the issues of energy, protein, carbohydrate, fat, vitamin and mineral nutrition of cows, sheep and goats.

Nutrition of monogastric animals. The subject of the discipline is an in-depth study of the principles of feeding rationing of monogastric animals and poultry, improving the skills of determining feeding rates and drawing up rations for animals of individual species and sex and age groups in specific economic conditions, using modern scientific achievements.

Feeding companion animals. Companion animals, or pets, which a person keeps for communication and receiving positive emotions. Such animals, to some extent, are opposed to agricultural animals, which are bred for the purpose of obtaining livestock products, so the discipline studies the principles of nutrition of all possible groups of animals (mammals, birds, fish, reptiles, amphibians, etc.). Nutrition of companion animals is now relevant to ensure their health and longevity. Currently, in our country there is a shortage of knowledge on the nutrition of domestic and exotic animals and the need of the labor market: the feed industry, nutritionists of veterinary medicine clinics, animal shelters, zoological parks, etc. The discipline studies the scientific basis of feeding companion animals, specific feeds and their quality assessment, feeding companion animals of different groups.

Fur farming as a business. Studying the discipline helps future specialists acquire theoretical knowledge and practical skills related to breeding and selection of fur animals, improvement of methods of keeping and feeding, drawing up technical and economic calculations, rational use of raw resources, live labor, fixed and working capital.

Industrial pig farming. The discipline is aimed at studying the issues of reproduction, maintenance, feeding, watering of pigs, provision of microclimate, manure removal, manure disposal, spatial and planning decisions, carrying out sanitary and veterinary measures. Contributes to the training of qualified specialists capable of rational application of various modern industrial technologies of pork production on an industrial basis.

Innovative beekeeping technologies. The discipline is aimed at studying issues of honey bee biology, breeding and keeping bees, innovative technologies for the production of beekeeping products, as well as familiarization with the main honey plants and modern methods of prevention of bee poisoning and diseases.

Computer preparation of rations. When conducting animal husbandry in modern conditions, various computer programs are used for drawing up rations and optimizing feeding, which greatly facilitate and speed up the work of specialists and are more accurate at the same time. The purpose of the discipline is to acquaint students with the principles of computer programs and to acquire skills when working with some of them.

Craft products of animal husbandry. The discipline is aimed at forming students' knowledge, abilities and skills regarding scientific and practical approaches to author's technologies for the production of livestock products (meat products such as jamon and basturma, raw fermented sausages, steaks, meat chips and snacks, cheeses, fermented milk products etc.) in the conditions of smart production. While studying the discipline, students will be able to familiarize themselves with the features of the technological process of the production of craft livestock products, acquire the skills and abilities to

independently plan and carry out the development of craft technologies of food products from raw materials of animal origin, master the ways and methods of production of craft animal products taking into account the requirements for creating high-quality products, as well as certain nutritional and biological value.

Marker associated selection in animal husbandry. Students of higher education when studying this discipline receive a full range of knowledge and practical skills regarding the organization of the possibilities of conducting the selection process in animal husbandry using genetic markers.

Organization of breeding business in animal husbandry. The discipline is aimed at the creative use of theoretical knowledge and practical skills acquired by specialists in solving organizational issues of breeding, the most effective organizational forms of introducing new breeding achievements into the practice of livestock breeding, studying the legislative and regulatory foundations of breeding in livestock breeding, theory and progressive methods of breeding work in relation to improvement of existing and creation of new highly productive breeds, lines, crosses, types and hybrids of animals; rational use of breeding resources, qualified resolution of organizational issues of the breeding business, implementation of modern methods of evaluation of breeding animals into breeding practice.

Organic production of goat products. The discipline is aimed at studying issues related to the development of the organic sector in the world and in Ukraine; general rules and peculiarities of conducting organic production, primary processing and advanced processing of goat products.

Designing pig enterprises. The purpose of studying the discipline is the formation of the acquirers of professional knowledge regarding the existing ways and methods of designing pig enterprises with various technological processes for the production of pig products, aimed at resource and energy saving, obtaining high-quality products for increasing the profitability of the industry. This gives future specialists the opportunity, based on the analysis of existing technologies in pig farming, design and construction of graphic drawings, to determine directions for the creation of new or improvement of existing technological processes of product production with the aim of their optimization and minimal resource consumption.

Service provision of livestock production. The discipline is aimed at studying issues of organization and provision of consulting, technical and organizational services in the process of production and processing of animal husbandry products.

Sociobiology of the honey bee. The discipline is aimed at an in-depth study of the honey bee family, the features of the functions of its individuals as a social organization of the third level of living integration, their interrelationships, forms of signaling, the level of life processes throughout the year, the adaptation to obtain and accumulate food in relation to the evolution of entomophilia are considered. Students acquire knowledge to perceive the honey bee family as a highly organized biological system with several life-regulating mechanisms and deep functional specialization.

Modern technologies of industrial poultry farming. The discipline is aimed at studying the technological process of production and primary processing of edible eggs and poultry meat, as well as by-products of poultry farming with the organization of product quality control in farms of various types and forms of management using modern achievements of domestic and foreign science.

Animals in Ukrainian and world culture. The discipline is aimed at determining the role and place of animals in human life, studying cultural traditions in relation to animals of the peoples of Ukraine and the world in order to preserve, spread and popularize cultural heritage. Mastering this discipline gives future specialists the opportunity to evaluate the achievements of domestic and world culture in the context of

the attitude towards animals, will form an ethical attitude towards animals, the observance of humanistic principles, high moral and ethical principles in social life and professional activity, will allow to determine, implement and ensure the functioning of humane technologies production and processing of livestock products in the concept of sustainable development.

Cattle productivity management. The purpose of the discipline is to teach students the existing methods of obtaining highly productive animals, ensuring the optimal balance of physiological processes in their bodies and managing the growth, reproduction and milk productivity of cattle. Among the tasks of studying the discipline: the use of breeding methods to obtain animals with the desired genetic potential; management of the formation of scar digestion and scar metabolism; management of growth and development of calves and young animals; methods of reproduction management in dairy and beef cattle breeding, management of milk and meat productivity, chemical composition of milk and morphological composition of cattle meat. As a result of studying the discipline, the student will possess a complex of knowledge on the formation of cattle productivity and the ability to plan the production of products of the desired quality, analyze the general condition of animals on the farm and make decisions about the application of methods of influencing animals in order to ensure the planned production indicators.

Physiology of lactation. Studying the discipline allows for a deeper understanding and assimilation of the biological, physiological and functional laws of the activity of the mammary gland, its connections with all systems of the body, and to learn to manage the processes: formation, accumulation and excretion of milk, that is, to quickly influence the maximum possible implementation of the genetically determined level of milk productivity of the animal .

Training of masters of sciences in branch of knowledge "Agricultural science and food" in specialty 207 "WATER BIORESOURCES AND AGUACULTURE" educational program "WATER BIORESOURCES AND AGUACULTURE"

Form of Training:	Licensed number of people:
– Full-time	75
– Part-time	75
Duration of Training:	
– Full-time educational and professional program	1 year and 4 months
– Part-time	1 year and 4 months
Credits ECTS:	
– educational and professional program	90
Language of Teaching	Ukrainian, English
Qualification	Master of Aquatic Bioresources and Aquaculture

The concept of training

In the process of their studies, the specialists in water bioresources learn 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 degree candidates acquire the techniques of artificial and natural restoration and protection of native, rare and endangered aquatic resources (AR) in fishery ponds.

Educational and professional program of master's training

Optional Block 1

The unit's task is to train aquaculture researchers to work on industrial fish farms of various types, in research institutes specializing in the reproduction and cultivation of traditional and non-traditional fish farming facilities, research on fish diseases, feeding, and conducting genetic and molecular research.

Areas of employment of graduates

After completing vocational training, specialists can work in state fisheries and private farms of Ukraine; State Agency of Fisheries of Ukraine; State enterprise "Ukrryba"; Research Institute of Fisheries.

Optional Block 2

The main task is to train specialists in environmental protection, able to work in the system of the Ministry of Environmental Protection or in the system of the State Fisheries Agency of Ukraine, in regional or district fisheries management, in scientific research institutions, in state or private enterprises engaged in breeding, protection and reproduction of rare and endangered species of fish, introducing them into reservoirs with the aim of restoring biological diversity, increasing the biological and fish productivity of aquatic ecosystems. The implementation of these measures is based on the scientific justification of the main approaches to the optimization of rational water use and the use of aquatic living resources and on the development of specific measures aimed at the protection of aquatic biodiversity, its multiplication and rational use.

Areas of employment of graduates

After graduation, specialists can work in the State Fisheries Agency of Ukraine; Management of the protection, use and reproduction of aquatic biological resources and regulation of fishing in the Kyiv region; in territorial fish protection bodies (regional and district); in the territorial bodies of the Ministry of Environmental Protection of Ukraine; in the Research Institute of Fisheries of the National Academy of Sciences of Ukraine; at the Institute of Hydrobiology of the National Academy of Sciences of Ukraine; in state and private fisheries; in the State Fish Inspectorate of Kyiv and other regions of Ukraine.

Optional Block 3

The main task is to train specialists in the rational extraction of aquatic living resources of natural reservoirs, able to work in the system of the State Fisheries Agency of Ukraine, in regional and district ichthyological services, in research institutions, in state or private fish farms that are engaged in extraction from natural reservoirs of industrial hydrobioresources. The final goal of the training is to acquire practical skills in restoring the biological biodiversity of hydrobioresources, increasing the biological and fish productivity of natural reservoirs. The implementation of the above is built on the scientific basis of rational use of the resource base of aquatic biological resources, its effective resource-saving extraction based on the sum of scientific and legal knowledge about aquatic living resources, forecasting and management of fish productivity of reservoirs.

Areas of employment of graduates

After training, specialists can work as managers, technologists and heads of various livestock enterprises, commercial firms, in breeding farms of the state and private sectors, regional and district agricultural administrations, agricultural and tribal associations of various levels, as well as in institutions of higher education and scientific institutions, as well as have the right to enter graduate school.

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", the Louis Pasteur National Lyceum (France) and others.

Proposed Topics of Master's qualification Thesis

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 (Ciclidae) 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 (Oncorhinchus mykiss) in breeding farms.
8. Effective use of synthetic germ cell ovulation stimulants in artificial reproduction of the white carps (Hypophtalmichthys 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.

Curriculum of Master training in educational program "Water Bioresources and Aquaculture" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Information technologies in fish farming	4	exam
CC 2	Communication in the fish farming collectives	4	exam
CC 3	Economics of fisheries sector	4	exam
CC 4	Pedagogics	4	exam
CC 5	Methodology and organization of scientific research on the basics of intellectual property	5	exam
Total		**21**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	test
OCP 2	Choice from the catalog 2	4	test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 6	Environmental physiology and biochemistry of aquatic organisms	5	exam
CC 7	Intensive aquaculture technologies	4	exam
CC 8	Theoretical foundations of fish farming	4	exam
CC 9	Theory of fish population dynamics	4	exam
CC 10	Production management in fishery	4	exam
CC 11	Production Practice	10	exam
CC 12	Certification exam	1	exam
CC 13	Preparation and defense of master's qualification thesis	9	
Total		**41**	

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
Optional components of EPP			
Free choice according to speciality			
Optional Block 1			
OC 1.1	Technologies of industrial aquaculture	4	exam
OC 1.2	Cultivation technologies of additional aquaculture facilities	4	exam
OC 1.3	Reproduction technologies of sturgeon and salmon fish	4	exam
OC 1.4	Pond aquaculture technologies	4	exam
OC 1.5	Scientific communication	4	exam
Optional Block 2			
OC 2.1	Protection of hydrobioresources	4	exam
OC 2.2	Assessment of the ecological state of water bodies	4	exam
OC 2.3	Biological resources of inland water bodies	4	exam
OC 2.4	Cultivation technologies of decorative hydrobioresources	4	exam
OC 2.5	Scientific communication	4	exam
Optional Block 3			
OC 3.1	Productivity biology of pond aquaculture facilities	4	exam
OC 3.2	Selection of industrial aquaculture facilities	4	exam
OC 3.3	Management of fish productivity of reservoirs	4	exam
OC 3.4	Bioproductivity of aquatic ecosystems	4	exam
OC 3.5	Scientific communication	4	exam
Total		**20**	
The total amount of compulsory components		**62**	
The total amount of optional components		**28**	
THE TOTAL AMOUNT OFF EPP		**90**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Information technologies in fish farming. Students learn the behavior and work of a specialist using standard reference and specialized literature, laws of Ukraine, government acts, and results of phychoanalytic researches, calculation techniwues and information technologies. Students learn to organize production processes in fishery taking into account personal peculiarities of a specialist, to reveal leader features and professional competence in managing fishery teams, to conduct business communication to prevent and regulate industrial conflicts at fisheries, to процеси рибництва з урахуванням індивідуальних особливостей особистості; проявляти лідерські якості та професійну компетентність в управлінні рибницькими колективами; організовувати ділове спілкування, попереджувати і врегульовувати виробничі конфлікти в колективах рибницьких підприємств; to manage personnel policies, to promote the image and professional ethics of specialists and fisheries.

Communication in the fish farming collectives. Students study the current state and problems of work safety in fishery. Students learn organizational demands of interbranch and branch standard and legal acts in work safety in order to implement them at fisheries which belong to the system of managing work safety; establishment and functioning work safety service at enterprises; means of keeping standards of productive environment and work safety while doing technological processes in fishery in order to approve management solutions which will prevent accidents, injuries, occupational diseases at the enterprises. Students also learn organization and population protection in emergency situations of economical, natural and ecological nature; prevention of appearance of emergency situations, measures to reduce loss; warning about the threat of

disasters; life support during accidents, major fires, accidents, natural disasters and in armed conflicts, conducting rescue operations, forecasting, monitoring and control of radioactive contamination, chemical contamination, ensuring the sustainability of agriculture facilities in emergencies.

Economics of fisheries sector. Students learn the profile of future administrator and specialist who knows the state of fishery of Ukraine within economic globalization, learns how to provide food security using fishery potential, development of national bodies of state regulation of fishery, regulatory policy in fishery, rent price for a water body and rent payment for the land under this body, conducting land auctions.

Pedagogics. Generates future specialists professional (general pedagogical) knowledge and skills that are in knowledge about the nature of learning, education and training, the main directions and principles, methods and forms of education and training, the principles of forming the content of education and training; approaches to evaluating the success of the training, skills characterize the organization of educational and training process.

Methodology and organization of research with the principles of intellectual property. The aim of the discipline is formation of the system of knowledge in methodology, theory of method and research process, methodical support of scientific and research activity at the stages of preparation of a Master paper, formation of the ability to organize research of a specific issue using the whole complex of the traditional methods of research including general and special methods. The main task of the theoretical part of the course is introduction to students the current concepts of research creation, the principles of methodology of scientific perception and methods of research. The main task of the practical part is the development of self-education ability, mastering skills of formation and application of perceived methodological position of research. In case of mastering the course students have to improve their skills of search, assortment and processing of scientific information, accurate formulation of a problem, aim, task, object, subject, methods of research. Introduction to students the principles of intellectual property and direction of them to gain knowledge and skills concerning registration of rights of ownership, their protection, commercialization, estimation and management are envisaged.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

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.

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. 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. 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.

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.

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.

Production management in fishery. This course will provide with theoretical knowledge and practical skills of production management that is how to develop an enterprise strategy, to analyze projects and methods of evaluation of their effectiveness, how to manage capital investment using the most effective tools of activities to get profit as well as to increase social effect, the value of assets and own capital.

Optional components of EPP

Free choice according to specialty

Optional Block 1

Technologies of industrial aquaculture. A discipline that studies the basics of industrial technology for the reproduction and cultivation of aquaculture objects; innovative technologies in industrial aquaculture; the latest methods of breeding and cultivating fish in the countries of the European Union, the USA, Canada, China, etc.; as well as integrated technologies in fish farming.

Cultivation technologies of additional aquaculture facilities. The discipline studies the peculiarities of the biology of non-traditional objects of pond fish farming; technologies for reproduction of non-traditional objects; cultivation of non-traditional objects in mono- and polyculture in the conditions of fish ponds; foreign experience of growing non-traditional aquaculture facilities in the conditions of farms.

Reproduction technologies of sturgeon and salmon fish. A discipline that provides knowledge of the theoretical foundations of artificial reproduction and methods of obtaining progeny of sturgeon and salmon fish in the conditions of aquaculture enterprises. The structure of the discipline includes the following sections: "Theoretical foundations of reproduction of sturgeon and salmon fish in natural conditions and in aquaculture", "Technologies of obtaining progeny of sturgeon and salmon fish at fisheries enterprises", "Technical support of works on artificial reproduction of sturgeon and salmon fish".

Pond aquaculture technologies. A discipline that studies the basics of the traditional technology of reproduction and cultivation of aquaculture objects; innovative technologies in pond fish farming; the latest methods of fish breeding in the countries of the European Union, the USA, Canada, China, etc.; economics and technologies of commercial fish farming; integrated technologies in fish farming.

Scientific communication. A discipline aimed at studying the possibilities of exchanging scientific information (ideas, knowledge, messages) between scientists and specialists, as well as the skills of representing scientific knowledge to a wide audience. During the study, the following types of scientific communication will be considered: direct connections - personal conversations, face-to-face scientific discussions, oral reports (personal networks); connections mediated by technical means of information replication – publication of books, scientific journals, abstract journals (mediated networks); mixed connections – scientific conferences, scientific and technical exhibitions (interactive networks). Different forms of official and unofficial contacts will be considered: addressed and non-addressed, formal and informal, interpersonal and impersonal, direct and indirect.

Optional Block 2

Protection of hydrobioresources. He studies the scientific foundations of the development and implementation of scientifically based measures for the protection of the hydrosphere as an environment inhabited by hydrobionts, the restoration of the biological balance of aquatic ecosystems, the preservation of the biodiversity of aquatic organisms, the rational use of aquatic living resources, and the reduction of anthropogenic impact on various types of reservoirs.

Assessment of the ecological state of water bodies. He studies the water quality control system and the ecological status of continental water bodies in accordance with the requirements of the European Framework Water Directive. Existing standardized indicators of water quality of continental fisheries reservoirs. As well as an assessment of the ecological state of continental water bodies of various types based on integral indicators of indicator organisms: natural (rivers, lakes, reservoirs) and artificial (ponds) hydroecosystems.

Biological resources of inland water bodies. A discipline that studies the biological processes of the production of organic substances in the plankton of the benthos of reservoirs and involves the acquisition of knowledge about the methods of determining the primary production of plankton and the destruction of organic substances in reservoirs, methods of calculating the production of populations of aquatic animals, the general patterns of their growth and the dynamics of population numbers. Considerable attention is paid to the study of the balance of organic substances and energy and the participation of aquatic animals in the processes of their transformation in aquatic ecosystems. The study of the discipline is aimed at deepening knowledge of the problems of formation and transformation of substances and energy by the autotrophic and heterotrophic components of aquatic ecosystems, factors that limit and stimulate the course of production and destruction processes.

Cultivation technologies of decorative hydrobioresources. He studies modern technologies of cultivation (breeding, growing and maintenance) of ornamental sea and freshwater fish, molluscs, crustaceans and other hydrobionts and cultivation of fodder for their vital activity; based on modern scientific developments and research in the field of cultivation of decorative hydrobionts.

Scientific communication. A discipline aimed at studying the possibilities of exchanging scientific information (ideas, knowledge, messages) between scientists and specialists, as well as the skills of representing scientific knowledge to a wide audience. During the study, the following types of scientific communication will be considered: direct connections - personal conversations, face-to-face scientific discussions, oral reports (personal networks); connections mediated by technical means of information replication – publication of books, scientific journals, abstract journals (mediated networks); mixed connections – scientific conferences, scientific and technical exhibitions (interactive networks). Different forms of official and unofficial contacts will be considered: addressed and non-addressed, formal and informal, interpersonal and impersonal, direct and indirect.

Optional Block 3

Productivity biology of pond aquaculture facilities. A discipline that studies the productivity of pond fish farming facilities; biological features of fish in connection with their reproduction; biological basis of management of sexual cycles of standing fish; biological features of broodstock and obtaining sexual products from them; biological provision of conditions for spawn incubation and rearing of young fish; increase in fish productivity of reservoirs.

Selection of industrial aquaculture facilities. The discipline studies the theoretical basis for the implementation of economically useful productive properties of fish when they are grown in industrial aquaculture conditions; modern methods of fish selection, aimed at the formation and heritable consolidation of economic and useful properties of objects of cultivation when they are grown in gardens, pools and recirculation plants. The use of genetic methods in fish selection for the identification of breeding material and for the accelerated formation and consolidation of acquired economic and useful properties of cultivation objects; organization and conduct of selection and breeding events at enterprises of various types and forms of ownership; method of scientific research in fish breeding.

Management of fish productivity of reservoirs. It studies the tireless use of ichthyofaunistic diversity of natural and natural-technical (reservoirs) continental reservoirs of Ukraine on the basis of a clear strategy and tactics of management of inland reservoirs for various purposes, normalization of relations between water consumers with the selection of the main one among them, which would be responsible for the state of fish the diversity of each specific water body. As well as a system of ensuring regional management of fish productivity in continental reservoirs through changes in legislation and fishing regulations, carrying out a cadastre, creating a network of protected reservoirs, developing and implementing state programs for the recovery of fish listed in the Red Book of Ukraine. Development of ways to increase fish productivity and improve the condition of the ichthyofauna of continental water bodies.

Bioproductivity of aquatic ecosystems. A discipline that studies the biological processes of the production of organic substances in the plankton of the benthos of reservoirs and involves the acquisition of knowledge about the methods of determining the primary production of plankton and the destruction of organic substances in reservoirs, methods of calculating the production of populations of aquatic animals, the general patterns of their growth and the dynamics of population numbers. Considerable attention is paid to the study of the balance of organic substances and energy and the participation of aquatic animals in the processes of their transformation in aquatic ecosystems. The study of the discipline is aimed at deepening knowledge of the problems of formation and transformation of substances and energy by the autotrophic and heterotrophic components of aquatic ecosystems, factors that limit and stimulate the course of production and destruction processes.

Scientific communication. A discipline aimed at studying the possibilities of exchanging scientific information (ideas, knowledge, messages) between scientists and specialists, as well as the skills of representing scientific knowledge to a wide audience. During the study, the following types of scientific communication will be considered: direct connections - personal conversations, face-to-face scientific discussions, oral reports (personal networks); connections mediated by technical means of information replication – publication of books, scientific journals, abstract journals (mediated networks); mixed connections – scientific conferences, scientific and technical exhibitions (interactive networks). Different forms of official and unofficial contacts will be considered: addressed and non-addressed, formal and informal, interpersonal and impersonal, direct and indirect.

FACULTY OF FOOD TECHNOLOGIES AND QUALITY MANAGEMENT OF AGRICULTURAL PRODUCTS

Dean-doctor of technical sciences, professor Larisa Vatslavivna Bal-Prylypko
Phone: (044) 527-89-50
E-mail: bplv@ukr.net
Location: academic building No. 12, room no.305-306

The faculty organizes and coordinates the educational process of preparing Masters in educational programs within the framework of specialties:

Specialty 175 "Information and measurement technology"

Educational program "Quality, standardization and certification"

The guarantor of the educational and professional program - Candidate of Technical Sciences, Associate Professor Yuliia Sliva

Graduate department:
Standardization and certification of agricultural products
Phone: (044) 527-82-78
E-mail: standardization@ukr.net
Head of the department – Candidate of Technical Sciences, Associate Professor Tolok Halyna.

Specialty 181 "Food technologies"

Educational program "Technologies of Storage, Preserving and Reprocessing of Meat"

The guarantor of the educational and professional program, doctor of technical sciences, professor Ihor Pavlovych Palamarchuk

Graduate department:
Meat, fish and seafood technologies
Phone: (044) 527-88-85
E-mail: holembovska@nubip.edu.ua
Head of the Department-candidate of Agricultural Sciences, Associate Professor Holembovska Nataliia

Educational program "Technologies of Storage and Reprocessing of Aquatic Bioresources"

The guarantor of the educational and professional program - Associate Professor Nataliia Slobodianiuk

Graduate department:
Meat, fish and seafood technologies
Phone: (044) 527-88-85
E-mail: holembovska@nubip.edu.ua
Head of the Department-Candidate of Agricultural Sciences, Associate Professor Holembovska Nataliia

Educational program "Nutritionology"

The Guarantor of the educational and professional program - Associate Professor Liudmyla Tyshchenko

Graduate department:

Meat, fish and seafood technologies

Phone: (044) 527-88-85

E-mail: holembovska@nubip.edu.ua

Head of the Department-Candidate of Agricultural Sciences, Associate Professor Holembovska Nataliia.

Training of masters of sciences in branch of knowledge "Electronics, automation and electronic communications" in specialty 175 "INFORMATION AND MEASUREMENT EQUIPMENT" educational program "QUALITY, STANDARDIZATION AND CERTIFICATION"

Attendance mode:	Licensed volume, persons:
- full-time	50
- part-time	50
Duration of training:	
- full-time educational and professional program	1 years 4 months
- part-time	1 years 4 months
ECTS credits:	
- educational and professional program	90
Language of instruction	Ukrainian, English
Graduate qualification	Master's degree in quality, standardization and certification

Training concept

A special feature of training specialists in quality, standardization and certification is that graduates of various training areas enter this program. Its special feature is its openness, multi-vector approach, flexibility and multi-variant approach. At the same time, there are significant differences in the list of selected disciplines of the curriculum of the program for bachelors with economic education, from the list of selected disciplines of programs for bachelors with technological, engineering or biological basic education.

The main tasks of the specialty are students' acquisition of knowledge about: the main components of the technical regulation system; the main legislative acts of Ukraine in the field of technical regulation; the main tasks, principles, scientific and practical approaches in the field of standardization, certification, metrology, quality; the influence of the technical regulation system on the efficiency of the economy; the fundamental regulatory documents in the field of standardization, certification, metrology, quality management international and european experience, the legislative regulatory framework in the field of technical regulation.

Areas of employment of graduates

The Master's degree in the educational program "Quality, standardization and certification" allows graduates to hold a wide range of positions: quality specialist, quality engineer, employee of the quality management department, validation department, technical control department, metrological service, standardization and certification specialist, internal auditor, etc. Such education is also necessary for specialists engaged in standardization of new types of products, certification of products and services, maintenance of technical documentation, implementation of internal audits and self-inspections, validation of technological processes, certification of personnel, equipment and premises, etc.

Practical training

During the internship, the foundations of practical activities, practical skills, skills and professional qualities of a future specialist in standardization, certification and quality management are laid.

The main bases of practice are: state enterprise "Ukrainian research and training center for standardization, certification and quality problems"; JSC "MZVKK" separate division "Myronivsky meat processing plant "LEHKO"; "Ukrainian quality association";

Bureau Veritas; LLC "TUF Ray land Ukraine"; Ukrainian Research Institute of Agricultural Radiology; Ukrainian Research Institute of forecasting and testing of agricultural production equipment and technologies named after Leonid Pogorilov; State Center for certification and expertise of agricultural products in Kyiv; PJSC "Zhashkivsky Creamery" Cherkasy region; SE "Malynske Forestry" Zhytomyr region; ALLC "Starinska poultry farm"; "Velikosnitinskiye educational and experimental farm named after O. Muzychenko" Kyiv region; Bilotserkovsky milk processing plant, Kyiv region; bakery complex No. 10, m Kyiv; LLC "Obolon", Kyiv; LLC "Rosinka", Kyiv; JSC "Farmak" Kyiv

Proposed Topics of Master's qualification Thesis

1. Development of a program of inter-laboratory comparisons of soil testing for compliance with the requirements of ISO/IEC Guide 43-1:1997 at PJSC "Mironovsky khliboprodukt".
2. Development of a program for managing environmental aspects of production in the conditions of a processing enterprise at JSC "Farmak".
3. Implementation of a system for statistical control of processes in the laboratory of testing agricultural machinery
4. Research of consumer requirements regarding the quality of wood for furniture production.
5. Development of proposals for improving the monitoring system for the production of condensed milk in the conditions of PJSC "Bershad-Moloko".
6. Development of a standard for the technology of growing gladioli and justification of standardized indicators on the basis of the state enterprise "UkrNDSTS".
7. Development of a model for calculating optimal feeding rations for cattle.
8. Development of a standard for ostrich cultivation technology and justification of standardized indicators.
9. Development of elements of a system for monitoring the safety and quality of berry products grown in private farms .
10. Assessment of EU requirements for validation of food testing methods and development of recommendations for implementation in the practice of agricultural enterprises.

Master's degree curriculum
according to the educational program "Quality, standardization and certification"
(educational and professional training program)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Legal support of management decisions	4	exam
CC 2	Business Foreign Language	4	exam
CC 3	Management psychology	4	exam
CC 4	Scientific communications in Master's research	4	exam
Total		**16**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1.	Choice from the catalog 1	4	credit
OCP 2.	Choice from the catalog 2	4	credit
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
CC 5.	Legislative metrology and standardization	5	exam
CC 6.	Quality management	6	exam, KP
CC 7.	Quality and safety management of agricultural and food products	6	exam
CC 8.	Information technologies and mathematical modeling of quality management systems	4	exam
CC 9.	Standardization and certification of agricultural products	5	exam, KP
CC 10.	Systematic approach and decision-making methods	4	exam
CC 11.	Research and innovation processes	4	exam
CC 12.	Audit and certification	4	exam
CC 13.	Economic aspects of entrepreneurial activity	4	exam
CC 14.	Practical training	4	
CC 15.	Preparation and defense of a master's qualification thesis	4	
Total		**50**	
Optional components of EPP			
Free choice according to speciality			
OC 1	Personnel Management	4	exam
OC 2	International and regional standardization and certification	4	exam
OC 3	Methods of ensuring and managing food quality	4	exam, KP
OC 4	Philosophy of science and innovative development	4	exam
OC 5	Quality management of agricultural products and production	4	exam
OC 6	Environmental Management	4	exam
OC 7	Standardization and certification of products, production facilities and quality assurance systems	4	exam, KP
OC 8	Intellectual property	4	exam
OC 9	Higher school pedagogy	4	exam
OC 10	Agricultural policy	4	exam
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Legal support of management decisions. The program provides for the study of a complex of modern legal knowledge, skills and abilities necessary for professional activities to ensure the powers of state bodies and provide public services to citizens. Help to better understand the essence and nature of public administration, study the legislation that regulates the activities of public administration bodies, as well as the practice of its application.

Business Foreign Language. The overall goal of the Professional Foreign Language Teaching Program is to develop students' professional language competencies, which will contribute to their effective functioning in the cultural diversity of the educational and professional environment. It examines the methodology of searching for new information in foreign-language sources, linguistic methods of analytical processing of foreign-language sources. Research of printed foreign-language original literature and expansion of lexical and grammatical skills. Methods and linguistic features of annotating and abstracting foreign-language sources, as well as the basics of translating professionally-oriented foreign-language sources are studied.

Management psychology. Theoretical and practical training of students on a deeper understanding of the conditions and factors, driving forces and determinants of personal development as a subject of management, the specifics of the motivational sphere of the manager, adaptive processes in the micro-society, types of managers, leadership styles.

Scientific communications in Master's research. The process of studying the discipline provides for: familiarization with the digital landscape and tools for supporting scientific communications of researchers; improving the level of digital competencies; creating a personal educational environment and profiles for identifying the researcher in the scientometric space; reviewing the provisions, initiatives and source base related to open science and open access, copyright to electronic content, ethics of establishing electronic communications; gaining experience in managing research data, implementing scientific communication, presenting and distributing research results in digital format and evaluating them; developing the image of a scientist.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

Legislative metrology and standardization. Standards of the organization (enterprises, institutions). Verification of the standard for compliance with the achieved level of development of science and technology in the relevant field of application of the standard. Determination of the achieved level of development of science and technology in the relevant field of application of the standard. Procedure for making changes to regulatory documents. Technical regulations. Legislation in the field of standardization. Procedure for revoking regulatory documents. Information about changes in regulatory documents. Unification of products and/or services. Standardization of products and/or services. State system of standardization. Standard control of technical documentation of an organization (enterprise, institution). Ways to provide the services of an organization (enterprise, institution) with the necessary documentation on standardization, quality management, and certification. Reports on the implementation of standards and the work of all services of the organization (enterprise, institution) on quality management and certification issues

Quality management. Quality management systems for products and/or services. Structure of the organization (enterprise, institution). Standards of the DSTU ISO 9000 Quality Management System. Special functions of product and/or service quality management systems. Creating, implementing and managing quality systems. Documentation of product and/or service quality management systems. Technological documentation. Work plan for product and or service quality management. Determining the needs and requirements of consumers in products and/or services. Product quality management processes at the marketing stage. Assessment of the quality level of products and/or services. Determining the ability of an organization (enterprise, institution) to meet the quality indicators of products and/or services that are required. Preventive actions based on the results of internal inspections of the quality management system. Measurement, analysis, and improvement in the quality management system. Correcting actions for inconsistencies identified as a result of internal and external inspections of the quality management system.

Quality and safety management of agricultural and food products. The program provides for the study of the requirements of the laws of Ukraine and regulatory documents on the quality and safety of agricultural products and food raw materials; the study of the maximum permissible levels of safety indicators according to national, European and international regulatory documents for various types of agricultural

products, DSTU ISO 14000 standards for Environmental Protection in relation to processing and agricultural enterprises.

Mastering practical skills in developing quality and safety management systems for feed and agricultural products at all stages of its production in accordance with DSTU ISO 9000 and based on HACCP principles.

Information technologies and mathematical modeling of quality management systems. The discipline is a course the knowledge of which allows students to understand the essence of using modeling results to select parameters for conducting technological processes and possible methods for calculating equipment in the industry technology, and to take a critical approach to choosing the organization of food production, the technological process of production. The study of this discipline gives future specialists the opportunity to scientifically and technically substantiate and manage technological processes in order to produce high-quality products, based on the position of system analysis.

Standardization and certification of agricultural products. The program provides for the study of the principles of international standardization and national standardization of agricultural products, the requirements of the main international, European and national legislative, regulatory and regulatory documents in the field of standardization, certification of agricultural products, quality and safety assurance, indicators of safety and quality of agricultural products, familiarization with the practice of creating regulatory documents.

Systematic approach and decision-making methods. The program provides for mastering the skills to identify system patterns, identify the main stages of problem solving, determine the system management technology that is rational based on achieving the goal of activity and using resources, and use the most well-known decision-making methods. Study of the principles of the system approach, technologies of typical control methods in systems, algorithm of the multi-criteria scale method.

Research and innovation processes. Methods of scientific research. Methods of research on the formation of product quality (services provided). Types and potential of material resources (equipment, tooling, resources) to determine the conditions for forming the quality of products (services provided). Methods for determining the need for material resources (equipment, tooling, resources) to determine the conditions for forming the quality of products (services provided). Information flows shaping the quality of products (services provided). Collection and processing of information flows. Analysis and systematization of information. Process modeling. Causal relationships in the areas of quality, standardization, and certification. Forecasting the development of the production system. Analysis of the development of the production system. Analysis of staff motivation. Methods of scientific research. Collection and processing of information flows. Analysis and systematization of information.

Audit and certification. Procedure for processing applications for certification of products and/or services, and/or quality systems. Certification objects of the certification scheme. Certification schemes. Rules for applying certification schemes. Rules for selecting certification schemes. Schemes for testing products and/or services, and/or quality systems. Certificates of conformity. National certification and accreditation systems of foreign countries. Self-assessment and internal audit of quality systems. External audit in the field of quality. Product certification in the UkrSEPRO system.

Economic aspects of entrepreneurial activity. The curriculum of the discipline provides for the study of theoretical concepts, as well as the acquisition and assimilation of practical skills in the ability to find specific ways and methods of making informed managerial decisions, conducting economic calculations, analytical and research work to identify internal reserves of production and economic activities of the enterprise.

Optional components of EPP

Free choice according to specialty

Personnel management System of measurable indicators of employee qualifications. General principles of social division of labor in Ukraine. System of regulatory documents of the sphere of labor: social division of labor. Positioning of a specialist in the social division of labor. Corporate culture of an organization (enterprise, institution). Socio-economic state of society and forecast of its development. Modeling of professional activity (specialist model). Modeling of social activity (personality model). Classification of structural elements of professional activity.

International and regional standardization and certification. The program provides for the study of the principles of international standardization, accreditation and conformity assessment, requirements of the main international and European legislative, regulatory and regulatory documents in the field of standardization, certification and accreditation, environmental protection in the agro-industrial complex, ensuring the quality and safety of food products and the activities of international and regional organizations for standardization, accreditation and conformity assessment.

Methods of ensuring and managing food quality Organization of good hygiene, production and laboratory practice in the conditions of food production enterprises in accordance with certain international requirements for food quality and safety management, development and implementation of quality and safety management systems based on HACCP principles. Certification of food products and management systems applicable to food production.

Philosophy of science and innovative development 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 post-non-classical ideals of science. Methodology of cognition of scientific and innovative activities. Study of the main scientific forms. The importance of fundamental and applied research strategies. Philosophical foundations of the classification of sciences. Philosophy of technology: theoretical and methodological aspects. Philosophical understanding of the scientific picture of the world. Logic of scientific research in the context of global problems of our time (environmental, man-made and social). Axiological dimension of science: the problem of scientist responsibility.

Quality management of agricultural products and production The problems of quality management in the context of ensuring the competitiveness of agricultural products and services provided by enterprises are considered. The most important stages of development, the current state of the theory and practice of quality management are highlighted. The article examines the economic concepts of quality, principles and methods of its assessment, organizational and methodological principles of quality assurance and quality management of products and services. Special attention is paid to quality management systems based on ISO 9000 series standards, TQM concept, environmental management systems and occupational health and safety management.

Environmental Management Environmental Management in accordance with DSTU ISO 14000. Environmental management documentation in accordance with DSTU ISO 14000. Methods and techniques for quantifying the environmental and social consequences of incidents and incidents. Emergency situations. Documents on the prevention or level of damage to resources (human, material, informational, etc.) in an emergency. Regulations on investigation and accounting of accidents, occupational diseases and accidents at enterprises, institutions and organizations. Direct and indirect assessments of harm to people and the environment. Modeling of emergency scenarios. Immediate causes of an event, accident, or incident. Centralized and local public

notification systems. Procedure for providing information in the field of protection of the population and territories. Basic measures to protect the population and territories in emergency situations. Personal protective equipment. Criteria and basic principles of evacuation measures. Evacuation bodies, their functions and tasks.

Standardization and certification of products, production facilities and quality assurance systems Mastering the scientific and theoretical foundations, methodological and organizational provisions of standardization and certification of agricultural products, production facilities and quality management.

Intellectual property The purpose of studying the discipline is an in-depth studying relations on the creation and circulation of intellectual property objects, a firm mastering of the legal mechanism of their regulation, obtaining the necessary skills to qualify the results of creative activity, and protecting the property and personal non-property rights of authors and owners both in Ukraine and abroad.

Higher school pedagogy/ The main objectives of studying the discipline are: formation of students 'knowledge about the theory of teaching and upbringing; formation of students' skills to identify and characterize pedagogical problems, selection of optimal pedagogical approaches for organizing training and upbringing.

Agricultural policy This discipline introduces future specialists to the basics of policy formation in the agricultural sector, provides an opportunity to master the methodological and methodological foundations of the development and implementation of a set of measures to support and ensure the development of agriculture in the system of intersectoral relations in the national economy, as well as to evaluate from the point of view of theory the practical actions of state structures to regulate the country's agro-industrial production.

Both domestic and foreign experience is studied. As a result of mastering the material, students get the opportunity to form their own opinion on the processes and phenomena occurring in the agricultural sector of the state economy on a professional basis.

Training of masters of sciences in branch of knowledge "Production and technologies" in specialty 181 "FOOD TECHNOLOGIES" educational program "TECHNOLOGIES OF STORAGE, PRESERVING AND REPROCESSING OF MEAT"

Attendance mode:	Licensed volume, persons:
- full-time	30
- part-time	30
Duration of training:	
- full-time educational and professional program	1 years 4 months
- part-time	1 years 4 months
ECTS credits:	
- educational and professional program	90
Language of instruction	Ukrainian, English
Graduate qualification	master's degree in food technology

Training concept

For high-quality management of technological processes of storage, canning and processing of meat raw materials, it is necessary to expand networks of training and retraining of specialists in this area. Today, there is an increase in the efficiency of implementing new technologies. It is clear that successful practical implementation of the solution of important meat processing problems for Ukraine is possible through the training of specialists in process engineers in the educational program "Technology of meat storage, canning and processing" of the educational degree "Master".

Factors that determine the needs of training Masters in the educational program "Technologies of meat storage, canning and processing" are: the increase in the production of high-quality traditional and new food products, the introduction and development of new intensive technologies is possible only with the wide use of the results of fundamental scientific research in biotechnology, the implementation of modern technical and technological solutions is largely determined by the shortage of highly qualified personnel who could provide not only storage, canning and processing of meat according to existing technologies, but also significantly increase their technological level; the modern development of domestic and foreign industry is formed on the basis of biotechnical industry with an economically closed mode of production, which is an industry targeted transformation of raw materials of animal origin into specific food products with specific hardware design, control, management systems and the economy is impossible without training specialists of this profile.

Areas of employment of graduates

Scientific, educational, analytical, expert, advisory, management activities in the field of food technologies.

Graduates are able to perform professional work in various linear and functional divisions of organizations of all forms of ownership and organizational and legal forms, as well as educational, scientific, advice, consulting and design organizations and institutions; divisions of state and municipal administration in accordance with the national classifier of Ukraine "Classification of professions" SC 003:2010.

The main task of the program is to train process engineers in the technology of meat storage, canning and processing, able to work at meat processing enterprises, as well as at enterprises of related industries, organizations and firms to perform organizational and managerial, production, pedagogical, project and research work related

to the research of new and improvement of existing technologies for the production of meat products and semi-finished products.

Practical training

Practical training of students is an integral part of the educational process of training specialists in the master's degree of the educational program "Technologies of meat storage, canning and processing".

During the internship, the foundations of practical activities, practical skills, skills and professional qualities of a future specialist in the meat processing industry are laid.

During the period of study at the university, the future master's degree passes two industrial internships. All practices differ in their purpose, content, and duration.

Practice is conducted at advanced enterprises of the meat processing industry after studying fundamental, general engineering, socio – economic disciplines.

Students take internships at processing plants, regardless of their ownership forms. The choice of practice bases is made taking into account the specialization, technical and technological support of production and orders for training specialists.

The main bases of practice are - VP NUBiP of Ukraine, NDG "Velikosnitynske named after O. Muzychenka" (slaughterhouse; educational-scientific-production laboratory of technology of meat and meat products), PE "Marshalok", PE "Drygalo" Kyiv region, Bila Tserkva; LLC "Globynsky meat processing plant" Poltava region, LLC "Cherkasia food company" Cherkasy region, CJSC "Kozyatynsky meat processing plant", LLC "Gaysynsky meat processing plant" Vinnytsia region.

Proposed Topics of Master's qualification Thesis

1. Improvement of the technology of split semi-finished products in the test shell.
2. Use of vegetable raw materials in the development of preventive products.
3. Application of herbal medicinal raw materials in the technology of boiled sausages.
4. Improvement of the technology of boiled sausages using flour from sprouted sea buckthorn seeds.
5. Improvement of the technology of pickled meat semi-finished products using berry concentrates.
6. Improvement of the technology of chopped semi-finished products using vegetables.
7. Improving the technology of pates using goose liver.

Curriculum of Master training in educational program "Technologies of Storage, Preserving and Reprocessing of Meat" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Occupational safety in the field	4	exam
CC 2	Business Foreign Language	4	exam
CC 3	Management psychology	4	exam
CC 4	Scientific communications in Master's research	4	exam
Total		**16**	
Optional components of EPP			

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	credit
OCP 2	Choice from the catalog 2	4	credit
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 5.	Modern methods of industry research	4	exam
CC 6.	Current problems of the industry	9	exam, KP
CC 7.	Technology of meat canning and storage	9	exam, KP
CC 8.	Biologically active substances from livestock raw materials	4	exam
CC 9.	Production processes optimization	4	exam
CC 10.	Food quality and safety management	4	exam
CC 11.	Production management	4	exam
CC 12.	Practical training	8	
CC 13.	Preparation and defense of a master's qualification thesis	4	
Total		**50**	
Optional components of EPP			
Free choice according to speciality			
OC 1	Microstructural analysis of meat and meat products	4	exam
OC 2	Special technologies	4	exam
OC 3	Philosophy of science and innovative development	4	exam
OC 4	Global trends in the development of the food industry	4	exam
OC 5	Agricultural policy	4	exam
OC 6	Pet food technology	4	exam
OC 7	Nutritionology of healthy eating	4	exam
OC 8	International and regional standardization and certification	4	exam
OC 9	Modern technologies of food storage and canning	4	exam
OC 10	Intellectual property	4	exam
OC 11	Higher school pedagogy	4	exam
OC 12	Economic aspects of entrepreneurial activity	4	exam
Total		**16**	
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OFF EPP		**90**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Occupational safety in the field. Methods and means of preserving and strengthening health, preventing diseases and ensuring professional legal capacity. Principles of selection of physical exercises, their layout and sequence of use for their intended purpose. Healthy lifestyle. Methods and means of developing professional significant psychophysical qualities. Methods of psychophysical training. Rules for preventing physical fatigue, overtraining, overexertion, and other crisis manifestations. Methods of self-monitoring the state of health, physical development and activity of functional systems of the body.

Business Foreign Language. The overall goal of the Professional Foreign Language Teaching Program is to develop students' professional language competencies, which will contribute to their effective functioning in the cultural diversity of the educational and professional environment. It examines the methodology of searching for new information in foreign-language sources, linguistic methods of analytical processing of

foreign-language sources. Research of printed foreign-language original literature and expansion of lexical and grammatical skills. Methods and linguistic features of annotating and abstracting foreign-language sources, as well as the basics of translating professionally-oriented foreign-language sources are studied.

Management psychology. Theoretical and practical training of students on a deeper understanding of the conditions and factors, driving forces and determinants of personal development as a subject of management, the specifics of the motivational sphere of the manager, adaptive processes in the micro-society, types of managers, leadership styles.

Scientific communications in Master's research. The process of studying the discipline provides for: familiarization with the digital landscape and tools for supporting scientific communications of researchers; improving the level of digital competencies; creating a personal educational environment and profiles for identifying the researcher in the scientometric space; reviewing the provisions, initiatives and source base related to open science and open access, copyright to electronic content, ethics of establishing electronic communications; gaining experience in managing research data, implementing scientific communication, presenting and distributing research results in digital format and evaluating them; developing the image of a scientist.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

Modern methods of industry research. The program provides for the study of the basic principles of research methodology in the food industry, modern classification of experiments, methods of selection, systematization and analysis of scientific information and research results, the procedure for registration of scientific paper and intellectual property rights.

Current problems of the industry. The program provides for the study of modern theoretical and practical foundations of current and resource-saving technologies for the production of new types of meat and combined products based on meat and increasing their shelf life.

Technology of meat canning and storage. The main task of studying the discipline is to deepen knowledge of technologies for canning meat and meat products, mastering technologies of the latest methods of canning and storage, technologies aimed at reducing weight loss and quality of raw materials and finished products, the formation of knowledge and practical skills to improve the main technological processes, a scientific approach to the choice of technologies for storing and preserving meat products.

Biologically active substances from livestock raw materials. During the study of the discipline, it is planned to provide future specialists with general information about the composition and basic properties of biological substances of various chemical nature that are part of animal raw materials, the use of these substances in the production of organic preparations. Students get acquainted with the characteristics of raw materials for the production of organic preparations, collection rules, primary processing, canning and transportation of endocrine-enzyme raw materials. They get acquainted with the technology of production of biologically active additives from animal raw materials.

Production processes optimization. The curriculum of the discipline provides for the study of theoretical and practical issues of optimization of typical technologies of the industry, aimed at identifying the best conditions for its implementation according to the chosen quality criterion during the study of the technological process itself. During the study of the discipline, it is planned to provide future specialists with knowledge on the basics of optimizing typical food production processes. As well as find out the most important optimization methods and use them to learn how to calculate the stages of

technological processes, hardware design of production sites. Based on the calculated parameters of process management or the design of devices, you can select those of them from the operation of which one can get the maximum technological effect with the planned production volume.

Food quality and safety management. The program provides for the study of the requirements of the laws of Ukraine and regulatory documents on the quality and safety of agricultural products and food raw materials; the study of the maximum permissible levels of safety indicators according to national, European and international regulatory documents for various types of agricultural products, DSTU ISO 14000 standards for Environmental Protection in relation to processing and agricultural enterprises.

Mastering practical skills in developing quality and safety management systems for feed and agricultural products at all stages of its production in accordance with DSTU ISO 9000 and based on HACCP principles.

Production management. The subject of study of the discipline is the formation of students' competence regarding basic principles, main categories, modern concepts, theoretical provisions and practical methods of managing the main activity of enterprises and skills in developing a production strategy, creating and using industry-specific production subsystems as the basis for ensuring the organization's mission.

Optional components of EPP

Free choice according to specialty

Microstructural analysis of meat and meat products. Meat components. Microstructure of muscle tissue and features of the structure of its varieties: skeletal, cardiac and smooth. Structure of skeletal muscle.

Special technologies. Familiarization with innovations in agricultural production, study of methods of introducing innovative development at enterprises of the processing and food industry.

Philosophy of science and innovative development. 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 post-non-classical ideals of science. Methodology of cognition of scientific and innovative activities. Study of the main scientific forms. The importance of fundamental and applied research strategies. Philosophical foundations of the classification of sciences. Philosophy of technology: theoretical and methodological aspects. Philosophical understanding of the scientific picture of the world. Logic of scientific research in the context of global problems of our time (environmental, man-made and social). Axiological dimension of science: the problem of scientist responsibility.

Global trends in the development of the food industry. Acquisition of knowledge of the basics of industrial technologies of food products in the world, development of skills of independent analysis of technological processes of food production in modern industrial conditions of the world.

Agricultural policy. This discipline introduces future specialists to the basics of policy formation in the agricultural sector, provides an opportunity to master the methodological and methodological foundations of the development and implementation of a set of measures to support and ensure the development of agriculture in the system of intersectoral relations in the national economy, as well as to evaluate from the point of view of theory the practical actions of state structures to regulate the country's agro-industrial production.

Both domestic and foreign experience is studied. As a result of mastering the material, students get the opportunity to form their own opinion on the processes and

phenomena occurring in the agricultural sector of the state economy on a professional basis.

Pet food technology The program provides for the study of theoretical and practical issues of modern technologies of feed production and production of feed additives, the choice of optimal options for specific natural and economic conditions in order to increase production and improve the quality of feed and increase the efficiency of their use.

Nutritionology of healthy eating Nutrition, food products, food substances and other components contained in products, their effects and interactions, norms of consumption, assimilation, loss and elimination from the body, their impact on various types of metabolism and their importance in maintaining health or causing diseases.

International and regional standardization and certification. At the present stage of development of society and its productive forces, standardization has become the most important means of improving production efficiency and improving product quality. Due to the need to increase demand for light industry products in Ukraine and abroad, increase its competitiveness, encourage the creation of new, non-traditional products with unique properties inherent only in vegetable raw materials, meet the requirements of consumers for the quality and reliability of products, taking into account the constant growth of commodity exchange between countries, standardization and certification of goods, industries and quality systems of light industry enterprises is becoming increasingly important.

Modern technologies of food storage and canning The program provides for the study of the main provisions on the current state and prospects for the development of technologies for storing and canning food products; characteristics of the principles of canning: biosis, anabiosis, abiosis; methods of canning; characteristics of the main methods and methods of preserving the quality of raw materials and food products; characteristics of modern methods of freezing raw materials and food products; frozen semi-finished products and culinary products; sterilization, pasteurization of food products.

Intellectual property The purpose of studying the discipline is an in-depth studying relations on the creation and circulation of intellectual property objects, a firm mastering of the legal mechanism of their regulation, obtaining the necessary skills to qualify the results of creative activity, and protecting the property and personal non-property rights of authors and owners both in Ukraine and abroad.

Higher school pedagogy/ The main objectives of studying the discipline are: formation of students 'knowledge about the theory of teaching and upbringing; formation of students' skills to identify and characterize pedagogical problems, selection of optimal pedagogical approaches for organizing training and upbringing.

Economic aspects of entrepreneurial activity. The curriculum of the discipline provides for the study of theoretical concepts, as well as the acquisition and assimilation of practical skills in the ability to find specific ways and methods of making informed managerial decisions, conducting economic calculations, analytical and research work to identify internal reserves of production and economic activities of the enterprise.

Training of masters of sciences in branch of knowledge "Production and technologies" in specialty 181 "FOOD TECHNOLOGIES" educational program "TECHNOLOGIES OF STORAGE AND REPROCESSING OF AQUATIC BIORESOURCES"

Attendance mode:	Licensed volume, persons:
- full-time	30
Duration of training:	
- full-time educational and professional program	1 years 4 months
ECTS credits:	
- educational and professional program	90
Language of instruction	Ukrainian, English
Graduate qualification	Master's degree in food technology

Training concept

In recent years, considerable attention in the processing industry has been paid to the processing of fish and seafood. The network of enterprises for this important area of food production from fish and non-fish seafood has been significantly expanded. Today, the efficiency of applying new technologies in the food industry is also increasing. It is clear that the successful solution of important tasks of fish processing enterprises for Ukraine is possible only by improving the training of specialists in process engineers in the educational program "Technology of aquatic bioresources storage and processing" of the Master educational degree.

The competence of a specialist of the Master educational degree in the educational program "Technologies of aquatic bioresources storage and processing" is determined by high professional potential and thorough training for activities not only in the conditions of functioning of modern agriculture, but also in the production sector in general.

Areas of employment of graduates

Scientific, educational, analytical, expert, advisory, management activities in the field of food technologies.

Graduates are able to perform professional work in various linear and functional divisions of organizations of all forms of ownership and organizational and legal forms, as well as educational, scientific, advice, consulting and design organizations and institutions; divisions of state and municipal administration in accordance with the national classifier of Ukraine "Classification of professions" SC 003:2010.

The main task of the program is to train process engineers in the technology of storage, canning and processing of fish and seafood, able to work in research institutions dealing with the problems of fish and seafood processing technology, bodies of the Ministry of Agrarian Policy and food of Ukraine and the state agency of Fisheries of Ukraine, fish processing enterprises and vessels.

Practical training

Practical training of students is an integral part of the educational process of training specialists in the master's degree of the educational program "Technologies of aquatic bioresources storage and processing".

During the internship, the foundations of practical activities, practical skills, skills and professional qualities of a future specialist in the fish processing industry are laid.

During the period of study at the university, the future master's degree passes two industrial internships. All practices differ in their purpose, content, and duration.

Practice is conducted at advanced enterprises of the meat processing industry after studying fundamental, general engineering, socio – economic disciplines.

Students take internships at processing plants, regardless of their ownership forms. The choice of practice bases is made taking into account the specialization, technical and technological support of production and orders for training specialists.

The main bases of practice are: LLC "Fish Manufactory" Kyiv region, LLC "Alaska" Kyiv region, LLC "Rybkoprodukt" Kyiv region, LLC "Berdyansk fish processing plant", Zaporizhzhia region, JSC "Ochakovsky fish canning plant", Mykolaiv region, CJSC "Chernihiv enterprise for processing and selling fish products "Chernhivryba", Chernihiv region, LLC "Fish industrial technologies", Zhytomyr region and others.

Proposed Topics of Master's qualification Thesis

1. Improvement of the technology of freshwater fish preserves and food additives.
2. Improvement of the technology of semi-finished products from hydrobionts using combined minced meat.
3. Improvement of the technology of culinary products based on freshwater fish roe.
4. Improvement of the technology of lightly salted fish products packed in modified media.
5. Improvement of the technology of pickled semi-finished products from sea fish.
6. Improvement of the technology of fish and vegetable products with the addition of kelp.
7. Justification and development of innovative technology for drying freshwater fish.

Curriculum of Master training in educational program "Technologies of storage and reprocessing of aquatic bioresources" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Occupational safety in the field	4	exam
CC 2	Business Foreign Language	4	exam
CC 3	Management psychology	4	exam
CC 4	Scientific communications in Master's research	4	exam
Total		**16**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	credit
OCP 2	Choice from the catalog 2	4	credit
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 5.	Modern methods of industry research	4	exam
CC 6.	Current problems of the industry	9	exam, KP
CC 7.	Modern technologies for fish products storing and canning	9	exam, KP
CC 8.	Technology of protein products from fish and seafood	4	exam
CC 9.	Production processes optimization	4	exam
CC 10.	Food quality and safety management	4	exam
CC 11.	Production management	4	exam

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
CC 12.	Practical training	8	
CC 13.	Preparation and defense of a master's qualification thesis	4	
Total		**50**	
Optional components of EPP			
Free choice according to speciality			
OC 1.	Microstructural analysis of fish and seafood	4	exam
OC 2.	International and regional standardization and certification	4	exam
OC 3.	Biologically active substances from fish and seafood	4	exam
OC 4.	Philosophy of science and innovative development	4	exam
OC 5	Special technologies	4	exam
OC 6	Global trends in the development of the food industry	4	exam
OC 7.	Modern technologies of food storage and canning	4	exam
OC 8.	Agricultural policy	4	exam
OC 9.	Nutritionology of healthy eating	4	exam
OC 10.	Intellectual property	4	exam
OC 11.	Higher school pedagogy	4	exam
OC 12.	Fish meal technology	4	exam
The total amount of compulsory components		**66**	
The total amount of optional components		**24**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Occupational safety in the field. Methods and means of preserving and strengthening health, preventing diseases and ensuring professional legal capacity. Principles of selection of physical exercises, their layout and sequence of use for their intended purpose. Healthy lifestyle. Methods and means of developing professional significant psychophysical qualities. Methods of psychophysical training. Rules for preventing physical fatigue, overtraining, overexertion, and other crisis manifestations. Methods of self-monitoring the state of health, physical development and activity of functional systems of the body.

Business Foreign Language. The overall goal of the Professional Foreign Language Teaching Program is to develop students' professional language competencies, which will contribute to their effective functioning in the cultural diversity of the educational and professional environment. It examines the methodology of searching for new information in foreign-language sources, linguistic methods of analytical processing of foreign-language sources. Research of printed foreign-language original literature and expansion of lexical and grammatical skills. Methods and linguistic features of annotating and abstracting foreign-language sources, as well as the basics of translating professionally-oriented foreign-language sources are studied.

Management psychology. Theoretical and practical training of students on a deeper understanding of the conditions and factors, driving forces and determinants of personal development as a subject of management, the specifics of the motivational sphere of the manager, adaptive processes in the micro-society, types of managers, leadership styles.

Scientific communications in Master's research. The process of studying the discipline provides for: familiarization with the digital landscape and tools for supporting scientific communications of researchers; improving the level of digital competencies; creating a personal educational environment and profiles for identifying the researcher in

the scientometric space; reviewing the provisions, initiatives and source base related to open science and open access, copyright to electronic content, ethics of establishing electronic communications; gaining experience in managing research data, implementing scientific communication, presenting and distributing research results in digital format and evaluating them; developing the image of a scientist.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of EPP

Modern methods of industry research. The program provides for the study of the basic principles of research methodology in the food industry, modern classification of experiments, methods of selection, systematization and analysis of scientific information and research results, the procedure for registration of scientific paper and intellectual property rights.

Current problems of the industry. The program provides for the study of the main provisions on the current state and prospects of development of the raw material base of Ukraine in freshwater reservoirs and the World Ocean; characteristics of the main indicators of the quality of fish raw materials, products and methods of their determination; characteristics of the main methods and methods of preserving the quality of live, chilled, frozen, salted fish; smoking, drying and other methods of preserving fish and hydrobionts; fish semi-finished products and culinary products, etc.

Modern technologies for fish products storing and canning. The program provides for the study of the main provisions on the current state and prospects for the development of technologies for storing and canning fish and seafood; characteristics of the principles of canning: biosis, anabiosis, abiosis; methods of canning; characteristics of the main methods and methods of preserving the quality of live fish; methods of cooling fish and seafood; characteristics of modern methods of freezing fish and seafood; frozen semi-finished products and culinary products; sterilization, pasteurization of fish products.

Technology of protein products from fish and seafood. The program provides for the study of theoretical and practical issues of modern technologies for the production of protein masses, minced meat, concentrates, hydrolysates, molded, structured, emulsion and multicomponent products of regulated composition and structure, the choice of optimal options for specific natural and economic conditions in order to spread the range, increase production volumes and increase the efficiency of using raw materials.

Production processes optimization. The curriculum of the discipline provides for the study of theoretical and practical issues of optimization of typical technologies of the industry, aimed at identifying the best conditions for its implementation according to the chosen quality criterion during the study of the technological process itself. During the study of the discipline, it is planned to provide future specialists with knowledge on the basics of optimizing typical food production processes. As well as find out the most important optimization methods and use them to learn how to calculate the stages of technological processes, hardware design of production sites. Based on the calculated parameters of process management or the design of devices, you can select those of them from the operation of which one can get the maximum technological effect with the planned production volume.

Food quality and safety management. The program provides for the study of the requirements of the laws of Ukraine and regulatory documents on the quality and safety of agricultural products and food raw materials; the study of the maximum permissible levels of safety indicators according to national, European and international regulatory documents for various types of agricultural products, DSTU ISO 14000 standards for Environmental Protection in relation to processing and agricultural enterprises.

Mastering practical skills in developing quality and safety management systems for feed and agricultural products at all stages of its production in accordance with DSTU ISO 9000 and based on HACCP principles.

Production management. The subject of study of the discipline is the formation of students' competence regarding basic principles, main categories, modern concepts, theoretical provisions and practical methods of managing the main activity of enterprises and skills in developing a production strategy, creating and using industry-specific production subsystems as the basis for ensuring the organization's mission.

Optional components of EPP

Free choice according to specialty

Microstructural analysis of fish and seafood – students' knowledge of the basics of microstructural analysis of fish and seafood, which they need to assess their quality under various storage technologies.

International and regional standardization and certification. At the present stage of development of society and its productive forces, standardization has become the most important means of improving production efficiency and improving product quality. Due to the need to increase demand for light industry products in Ukraine and abroad, increase its competitiveness, encourage the creation of new, non-traditional products with unique properties inherent only in vegetable raw materials, meet the requirements of consumers for the quality and reliability of products, taking into account the constant growth of commodity exchange between countries, standardization and certification of goods, industries and quality systems of light industry enterprises is becoming increasingly important.

Biologically active substances from fish and seafood. The curriculum provides for the study of the characteristics of biologically active substances in the composition of various hydrobionts, theoretical foundations and technology for obtaining biologically active substances from fish and seafood, and general methods of their control.

International standardization and certification of technologies, raw materials and finished products – at the present stage of development of society and its productive forces, standardization has become the most important means of improving production efficiency and improving product quality. Due to the need to increase demand for light industry products in Ukraine and abroad, increase its competitiveness, encourage the creation of new, non-traditional products with unique properties inherent only in vegetable raw materials, meet the requirements of consumers for the quality and reliability of products, taking into account the constant growth of commodity exchange between countries, standardization and certification of goods, industries and quality systems of light industry enterprises is becoming increasingly important.

Philosophy of science and innovative development. 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 post-non-classical ideals of science. Methodology of cognition of scientific and innovative activities. Study of the main scientific forms. The importance of fundamental and applied research strategies. Philosophical foundations of the classification of sciences. Philosophy of technology: theoretical and methodological aspects. Philosophical understanding of the scientific picture of the world. Logic of scientific research in the context of global problems of our time (environmental, man-made and social). Axiological dimension of science: the problem of scientist responsibility.

Special technologies. Familiarization with innovations in agricultural production, study of methods of introducing innovative development at enterprises of the processing and food industry.

Global trends in the development of the food industry. Acquisition of knowledge of the basics of industrial technologies of food products in the world, development of skills of independent analysis of technological processes of food production in modern industrial conditions of the world.

Modern technologies of food storage and canning. The program provides for the study of the main provisions on the current state and prospects for the development of technologies for storing and canning food products; characteristics of the principles of canning: biosis, anabiosis, abiosis; methods of canning; characteristics of the main methods and methods of preserving the quality of raw materials and food products; characteristics of modern methods of freezing raw materials and food products; frozen semi-finished products and culinary products; sterilization, pasteurization of food products.

Agricultural policy. This discipline introduces future specialists to the basics of policy formation in the agricultural sector, provides an opportunity to master the methodological and methodological foundations of the development and implementation of a set of measures to support and ensure the development of agriculture in the system of intersectoral relations in the national economy, as well as to evaluate from the point of view of theory the practical actions of state structures to regulate the country's agro-industrial production.

Both domestic and foreign experience is studied. As a result of mastering the material, students get the opportunity to form their own opinion on the processes and phenomena occurring in the agricultural sector of the state economy on a professional basis.

Nutritionology of healthy eating. Nutrition, food products, food substances and other components contained in products, their effects and interactions, norms of consumption, assimilation, loss and elimination from the body, their impact on various types of metabolism and their importance in maintaining health or causing diseases.

Intellectual property. The purpose of studying the discipline is an in-depth studying relations on the creation and circulation of intellectual property objects, a firm mastering of the legal mechanism of their regulation, obtaining the necessary skills to qualify the results of creative activity, and protecting the property and personal non-property rights of authors and owners both in Ukraine and abroad.

Higher school pedagogy. The main objectives of studying the discipline are: formation of students 'knowledge about the theory of teaching and upbringing; formation of students' skills to identify and characterize pedagogical problems, selection of optimal pedagogical approaches for organizing training and upbringing.

Fish meal technology. The discipline provides for the study of methods and methods of manufacturing, storing, using and evaluating the quality of feed products from hydrobionts; the study of the current state of feed production in the world and domestic fishing industry, methods of production of fish meal, its energy and biological value, as well as changes that occur during production and storage.

Training of masters of sciences in branch of knowledge "Production and technologies" in specialty 181 "FOOD TECHNOLOGIES" educational program "NUTRITIONOLOGY"

Attendance mode:	Licensed volume, persons:
- full-time	15
Duration of training:	
- full-time educational and scientific program	1 years 10 months
ECTS credits:	
- educational and scientific program	120
Language of instruction	Ukrainian, English
Graduate qualification	master's degree in food technology

Training concept

The main task of a nutritionist is to select an effective, correct and balanced diet that will improve the overall health of a person and contribute to the treatment of diseases of the digestive system. The nutritionist should take into account the health status of each individual patient, constantly monitor changes in its body and make changes to the diet based on these data. In addition, the nutritionist is charged with the function of familiarizing the population with the main principles of healthy nutrition and teaching them to correctly use the acquired knowledge in everyday life.

Training high-level nutritionists is not an easy task, it requires not only qualified teachers, but also modern equipment, practical classes and the ability to conduct independent research.

In addition, the profession of a nutritionist requires responsibility, benevolence, sociability, and the ability to easily master new knowledge, methods, and methodological approaches from a specialist of this profile.

Areas of employment of graduates

Graduates are able to perform professional work in various linear and functional divisions of organizations of all forms of ownership and organizational and legal forms, as well as educational, scientific, advice, consulting and design organizations and institutions; divisions of state and municipal administration in accordance with the national classifier of Ukraine "Classification of professions" SC 003:2010.

The specialist is prepared for professional activity in companies, small enterprises and institutes of the technological, social, medical sector and the health and labor sector (ensuring the quality of food safety systems , managing programs aimed at increasing people's well-being in the fields of Health, education, culture, sports, recreation, environmental protection, providing social services).

Training of young promising specialists who are ready to successfully start a career as: technologists with deep practical skills and theoretical knowledge in the field of preparation of health food and fitness products; experts for consulting groups who have practical experience with real projects in the field of healthy food industry, Wellness and SPA industry; nutritionists and healthy food consultants who know how to ensure a healthy lifestyle, prepare delicious healthy food and enjoy it.

Practical training

Practical training of students is an integral part of the educational process of training specialists in the master's degree of the educational program "Nutritionology". Practical

training involves working at leading enterprises, organizations, and institutions in Ukraine; long-term summer internships, trainings, and internships abroad.

Proposed Topics of Master's qualification Thesis

1.Justification of complex family nutrition diets for the prevention of the most common diseases in Ukraine.

2. Development of a dietary nutrition system for children of Chaika children's health camp in Kyiv region.

3. Development of the sauce studio concept

4. Scientific and practical justification of the development of the diet of athletes.

5. Scientific and practical bases of development of rations and technologies of semi-finished products for special purposes

6.Scientific and technical foundations of rational catering for students in the NULES of Ukraine on the basis of the student canteen.

7. Scientific justification of military rations.

8. Scientific and practical justification of the technology of production of frozen culinary semi-finished products for health purposes.

Curriculum of Master training in educational program "Nutritionology" (educational and research program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of ERP			
CC 1	Modern research methods	4	exam
CC 2	Management psychology	4	exam
CC 3	Food chemistry	6	exam
CC 4	Business Foreign Language	4	exam
CC 5	Philosophy of science and innovative development	4	exam
CC 6	Scientific communications in Master's research	4	
CC 7	Higher school pedagogy	4	
Total		**29**	
Optional components of ERP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1.	Choice from the catalog 1	4	credit
OCP 2.	Choice from the catalog 2	4	credit
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of ERP			
CC 6	Food legislation and policy	4	exam
CC 7	Physiology and epigenetics of nutrition	6	exam
CC 8	Hygiene, toxicology and food safety	6	exam
CC 9	Nutritionology of healthy eating	6	exam, KP
CC 10	Nutrition of different categories of the population	6	exam
CC 11	Healthy eating technologies	6	exam, KP
CC 12	Production management	4	exam
CC 13	Agricultural policy	4	exam
CC 14	Practical training	12	exam
CC 15	Preparation and defense of a master's qualification thesis	5	
Total		**59**	
Optional components of ERP			
Free choice according to speciality			

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
OC 1	Microbiota, probiotics, and prebiotics	4	exam
OC 2.	Ethics in dietetics	4	exam
OC 3.	Sports and preventive nutrition	4	exam
OC 4.	Food and dietary supplements	4	exam
OC 5.	Food quality and safety management	4	exam
OC 6.	Organization of scientific work preparation	4	exam
OC 7.	Health advertising	4	exam
OC 8.	Molecular technology of health products	4	exam
OC 9.	Technology of medical and preventive products	4	exam
OC 10.	Innovative technologies in nutrition	4	exam
OC 11.	Intellectual property	4	exam
OC 12.	International and regional standardization and certification	4	exam
Total		**24**	
The total amount of compulsory components		**88**	
The total amount of optional components		**32**	
THE TOTAL AMOUNT OF ERP		**120**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of ERP

Modern methods of industry research The program provides for the study of the basic principles of research methodology in the food industry, modern classification of experiments, methods of selection, systematization and analysis of scientific information and research results, the procedure for registration of scientific paper and intellectual property rights.

Management psychology Theoretical and practical training of students on a deeper understanding of the conditions and factors, driving forces and determinants of personal development as a subject of management, the specifics of the motivational sphere of the manager, adaptive processes in the micro-society, types of managers, leadership styles.

Food chemistry Chemical composition of food systems (raw materials, semi-finished products, finished products), its changes in the process of technological flow under the influence of various factors (physical and chemical) and general patterns of these transformations. It includes the study of the relationship between the structure and properties of food substances and its impact on the properties and nutritional value of food products.

Business Foreign Language The overall goal of the Professional Foreign Language Teaching Program is to develop students' professional language competencies, which will contribute to their effective functioning in the cultural diversity of the educational and professional environment. It examines the methodology of searching for new information in foreign-language sources, linguistic methods of analytical processing of foreign-language sources. Research of printed foreign-language original literature and expansion of lexical and grammatical skills. Methods and linguistic features of annotating and abstracting foreign-language sources, as well as the basics of translating professionally-oriented foreign-language sources are studied.

Philosophy of science and innovative development 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 post-non-classical ideals of science. Methodology of cognition of

scientific and innovative activities. Study of the main scientific forms. The importance of fundamental and applied research strategies. Philosophical foundations of the classification of sciences. Philosophy of technology: theoretical and methodological aspects. Philosophical understanding of the scientific picture of the world. Logic of scientific research in the context of global problems of our time (environmental, man-made and social). Axiological dimension of science: the problem of scientist responsibility.

Scientific communications in Master's research The process of studying the discipline provides for: familiarization with the digital landscape and tools for supporting scientific communications of researchers; improving the level of digital competencies; creating a personal educational environment and profiles for identifying the researcher in the scientometric space; reviewing the provisions, initiatives and source base related to open science and open access, copyright to electronic content, ethics of establishing electronic communications; gaining experience in managing research data, implementing scientific communication, presenting and distributing research results in digital format and evaluating them; developing the image of a scientist.

Higher school pedagogy. The main objectives of studying the discipline are: formation of students 'knowledge about the theory of teaching and upbringing; formation of students' skills to identify and characterize pedagogical problems, selection of optimal pedagogical approaches for organizing training and upbringing.

SPECIAL (PROFESSIONAL) TRAINING CYCLE

Compulsory components of ERP

Food legislation and policy. The main provisions of normative legal acts regulating healthy nutrition; the main provisions of the law of Ukraine "On the safety and quality of food products and food raw materials", the law of Ukraine "On milk and dairy products", "On fish, meat products and food products from them", "On withdrawal from circulation, processing, disposal, destruction or further use of low-quality and dangerous products", "On the protection of the population from infectious diseases", "On consumer rights protection". Legal basis for the activity of a nutritionist.

Physiology and epigenetics of nutrition. Formation of a holistic view of the regularities of functions and processes in the whole organism and its parts (systems, organs, tissues, cells), identification of the causes, mechanisms and patterns of vital activity of the body at various stages of ontogenesis and phylogenesis in interaction with the environment in the dynamics of life processes.

Hygiene, toxicology and food safety. Hygienic requirements for production and the environment, problems of human interaction with the environment;basic laws of hygiene science and general laws of health connection with factors and environmental conditions; environmental factors and their compliance with natural levels and hygiene standards; conducting toxicological and hygienic experiments, which students acquire in the course of performing laboratory work; conducting hygienic expertise of certain types of products and projects. Alimentary toxicology-theory and methodology of rationing of contaminants in food products; determination of alimentary risks of morbidity; features of rationing of chemical and radioactive substances in food and drinking water. Hygienic assessment and regulation of transgenic food.

Nutritionology of healthy human nutrition. Nutrition, food products, food substances and other components contained in products, their effects and interactions, norms of consumption, assimilation, loss and elimination from the body, their impact on various types of metabolism and their importance in maintaining health or causing diseases.

Nutrition of different categories of the population Hygienic principles of nutrition of certain groups of the population. nutrition of children of different age groups. Features of

nutrition of persons of intellectual labor, employees of industrial enterprises, agricultural workers; nutrition of athletes, elderly and senile age; requirements for nutrition of pregnant and nursing mothers; non-traditional types of nutrition (vegetarian nutrition, nutrition of macrobiotics, nutrition in the system of yoga teaching, separate nutrition, raw food, fasting as a dietary method, nutrition by blood type, nutrition according to Ayurveda).

Healthy eating technologies Theoretical and practical knowledge of the ingredient composition of functional food products, their nutritional value and health-improving impact on the human body; new technologies for the production of health-improving food products, including for separately selected population groups. Types of biological action of food and types of nutrition. Axioms of human biological existence and principles of rational nutrition.

Production management. The subject of study of the discipline is the formation of students' competence regarding basic principles, main categories, modern concepts, theoretical provisions and practical methods of managing the main activity of enterprises and skills in developing a production strategy, creating and using industry-specific production subsystems as the basis for ensuring the organization's mission.

Agricultural policy. This discipline introduces future specialists to the basics of policy formation in the agricultural sector, provides an opportunity to master the methodological and methodological foundations of the development and implementation of a set of measures to support and ensure the development of agriculture in the system of intersectoral relations in the national economy, as well as to evaluate from the point of view of theory the practical actions of state structures to regulate the country's agro-industrial production.

Both domestic and foreign experience is studied. As a result of mastering the material, students get the opportunity to form their own opinion on the processes and phenomena occurring in the agricultural sector of the state economy on a professional basis.

Optional components of ERP

Free choice according to specialty

Microbiota, probiotics, and prebiotics General terms on human microecology, composition and functions of microflora of various human biotopes; general concepts of normoflora preparations; basic requirements for probiotic microorganisms; basic technologies for manufacturing normoflora preparations and functional nutrition products based on probiotic microorganisms; requirements for normoflora preparations.

A modern view of the role of pro - and prebiotic drugs. Relevance of creating domestic multicomponent probiotic drugs. Microbial ecological system of humans. Physiological functions of normal microflora. List of probiotics and prebiotics registered in Ukraine. Classification of prebiotic components. Clinical use of probiotic drugs.

Ethics in dietetics Organization of the nutrition system of a healthy and sick person at different age stages by applying modern scientific provisions of nutritionology and nutrition organization in medical and preventive, health-improving and educational institutions, as well as methods of prevention using a specially selected diet.

Sports and preventive nutrition Theoretical and practical aspects of the impact of nutrition on the health of people of different groups; fundamentals of rational nutrition; theoretical and practical foundations of preventive nutrition; properties of individual groups of food products and their importance for health promotion. Ways to preserve and promote health through healthy, rational preventive and therapeutic nutrition.

Food and dietary supplements. Formation of necessary theoretical knowledge about food and dietary supplements, their classification, composition, role in food

technologies and nutrition, assessment from the point of view of toxicology and medicobiological requirements.

Food quality and safety management The program provides for the study of the requirements of the laws of Ukraine and regulatory documents on the quality and safety of agricultural products and food raw materials; the study of the maximum permissible levels of safety indicators according to national, European and international regulatory documents for various types of agricultural products, DSTU ISO 14000 standards for Environmental Protection in relation to processing and agricultural enterprises.

Mastering practical skills in developing quality and safety management systems for feed and agricultural products at all stages of its production in accordance with DSTU ISO 9000 and based on HACCP principles.

Organization of scientific work preparation Providing students with knowledge on the classification of sciences, scientific and technical potential, organization of research activities in Ukraine, organizational bases of scientific research, basic scientific methodologies and methods, special research methods.

Health advertising Effective formation of a healthy lifestyle, as well as preserving and strengthening one's own health by improving the living conditions of an individual based on rational nutrition.

Molecular technology of health products The study of the role of individual biocomponents in the vital activity of the human body and the study of the features of technologies for obtaining new generation food products with pre-predicted properties, familiarizing students with new methods of processing natural functional raw materials as a source of necessary functional ingredients, the formation of theoretical and practical knowledge of students, as well as teach students from a scientifically based position to analyze and improve the technology of food production of a new generation in specific production conditions.

Technology of medical and preventive products It covers the study of the following main objects: groups of functional components that make up food systems, their health-improving significance in the process of preventive and therapeutic nutrition; the main groups of health-improving food products and functional beverages.

Innovative technologies in nutrition Formation of students' theoretical foundations and practical skills in food production based on innovative technologies used in the modern food industry and based on the results of scientific research in the industry.

Intellectual property The purpose of studying the discipline is an in-depth studying relations on the creation and circulation of intellectual property objects, a firm mastering of the legal mechanism of their regulation, obtaining the necessary skills to qualify the results of creative activity, and protecting the property and personal non-property rights of authors and owners both in Ukraine and abroad.

International and regional standardization and certification. At the present stage of development of society and its productive forces, standardization has become the most important means of improving production efficiency and improving product quality. Due to the need to increase demand for light industry products in Ukraine and abroad, increase its competitiveness, encourage the creation of new, non-traditional products with unique properties inherent only in vegetable raw materials, meet the requirements of consumers for the quality and reliability of products, taking into account the constant growth of commodity exchange between countries, standardization and certification of goods, industries and quality systems of light industry enterprises is becoming increasingly important.

LAW FACULTY

Dean – Doctor of Law, Professor Yara Olena Sergiivna
Tel.: (044) 259-97-25
E-mail: lawyer_dean@twin.nubip.edu.ua
Location: Building № 6, Room 231

Faculty organizes and coordinates educational process of master training in educational program within specialties:

Specialty 081 "Law"

Educational program "Law"

Guarantor of the educational and professional program – Doctor of Law, Associate Professor Deineha Maryna Andriyivna

Graduating department:
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 Yermolenko Volodymyr Mykhaylovych

International Law and Comparative Law
Tel.: (044) 259-97-25
E-mail: interlaw_chair@twin.nubip.edu.ua
Head of Department – Doctor of Law, Professor Ladychenko Viktor Valerijovych

Administrative and Finance Law
Tel.: (044) 259-97-25
E-mail: adminlaw@twin.nauu.kiev.ua
Head of Department – Doctor of Law, Professor Kurylo Volodymyr Ivanovych

Civil and Economic Law
Tel: (044) 259-97-25
E-mail: civillaw_chair@twin.nubip.edu.ua
Head of the department – Doctor of Law, Associate professor, Piddubnyi Oleksiy Yuriyovych

Training of masters of sciences in branch of knowledge "Law" in specialty 081 "LAW" educational program "LAW"

Form of Training:	Licensed number of persons:
– Full-time	75
– Part-time	75
Duration of Training:	
– Full-time educational and professional program	1 year 4 months
– Part-time	1 year 4 months
Credits ECTS:	
– educational and professional program	90
Language of teaching	Ukrainian
Qualification	Master of Law

Training concept

Program-targeted training of specialists in the field of law whose work is to establish the rule of law in society and the development of legal consciousness and legal culture of citizens. Training of highly qualified and competitive specialists in the field of law as a social phenomenon, its individual components (branches, institutions) in the selected block of elective disciplines with environmental and natural resource orientation, able to solve complex problems and problems in the learning process during scientific researches, as well as in the field of lawmaking and law enforcement. Education of a professional lawyer capable of solving legal support issues from various fields of social activity.

Education and professional training program

Education and professional training program (EPTP) corresponds to the mission of NULES of Ukraine in terms of creating, systematizing, preserving and disseminating modern scientific knowledge to improve people's lives, as it aims to study modern legal issues in the field of environmental safety, environmental protection, rational use and reproduction of natural resources. EPTP provides training for applicants of the second (master) level, who have general and special competencies in the field of law, with in-depth study of environmental and natural resources disciplines. Many of the disciplines are of personal authorship and are innovative. EPTP provides practical training of the specialty in public and local authorities, enterprises, institutions and organizations. EPTP is developed on the basis of the student-centered approach which is realized through individualization of education.

Areas of employment of graduates

EPTP provides training of highly qualified and competitive specialists in the field of law, including environmental lawyers; it is also aimed at environmental education and the formation of future lawyers' environmental culture. The level of training and qualification of graduates gives them the opportunity to work as legal advisers to economic entities in state executive bodies, local governments, relevant departments and offices that exercise authority of public policy implementing, including state environmental policy. EPTP also provides proper future scientific and pedagogical workers` training, namely assistant professor, senior lecturer, etc. EPTP provides an opportunity to continue education in the third-level (educational and scientific) program of higher education, the acquisition of additional qualifications in the adult education system.

Curriculum of Master training in educational program "Law" (educational and professional program of master's training)

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
GENERAL TRAINING CYCLE			
Compulsory components of EPP			
CC 1	Foreign language of professional direction	4	Exam
CC 2	Philosophy of law	5	Test/ Exam
Total		**9**	
Optional components of EPP			
Free choice according to the preferences of students from the list of disciplines			
OCP 1	Choice from the catalog 1	4	Test
OCP 2	Choice from the catalog 2	4	Test
Total		**8**	
SPECIAL (PROFESSIONAL) TRAINING CYCLE			
Compulsory components of EPP			
CC 3	Legal bases of sustainable development of rural areas	5	Test/ Exam
CC 4	Environmental policy and EU law	5	Test/ Exam
CC 5	Contract law	5	Test/ Exam
CC 6	Legal regulation of information relations	4	Test/ Exam
CC 7	Practical training	30	protection
Total		**49**	
Optional components of EPP			
Free choice according to specialty			
OC 1	Agrarian law of foreign countries	4	Exam
OC 2	State registration of land plots and rights to them	4	Exam
OC 3	European Environmental Law	4	Exam
OC 4	European Energy Law	4	Exam
OC 5	European Climate Law	4	Exam
OC 6	European General Food Law Regulation	4	Exam
OC 7	Protection of environmental rights	4	Exam
OC 8	Intellectual Property Protection Rights to Plant Varieties	4	Exam
OC 9	Competition law	4	Exam
OC 10	Corporate lawyer	4	Exam
OC 11	Migration law	4	Exam
OC 12	International environmental law	4	Exam
OC 13	International economic law	4	Exam
OC 14	International Energy Security Law	4	Exam
OC 15	International Nuclear Security Law	4	Exam
OC 16	Patent law	4	Exam
OC 17	Environmental safety law	4	Exam
OC 18	Law and the state of sustainable development	4	Exam
OC 19	Legal regulation of social guarantees of military personnel	4	Exam
OC 20	Legal bases of ecological management	4	Exam
OC 21	Commercial Litigation Concerns	4	Exam
OC 22	Problems of preventing and combating corruption	4	Exam
OC 23	Property rights problems	4	Exam
OC 24	Food Law	4	Exam
OC 25	ECHR decisions in national proceedings	4	Exam
OC 26	Judicial lawmaking	4	Exam
OC 27	Current problems of the judiciary system in Ukraine	4	Exam
OC 28	Theory and practice of criminal-legal qualification	4	Exam
OC 29	Consumer rights protection	4	Exam
OC 30	Values and the Law	4	Exam
Total		**24**	

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
The total amount of compulsory components		**58**	
The total amount of optional components		**32**	
THE TOTAL AMOUNT OF EPP		**90**	

Annotations of disciplines in the curriculum

GENERAL TRAINING CYCLE
Compulsory components of EPP

Foreign language of professional direction. The overall goal of the professional Foreign Language teaching Program is to form students' professional language competencies, which will contribute to their effective functioning in the cultural diversity of the educational and professional environment.

Philosophy of law. The educational unit is aimed at the formation of philosophical and legal thinking of masters students, skills and competencies necessary for professional activities based on the understanding of law as a cultural value.

SPECIAL (PROFESSIONAL) TRAINING CYCLE
Compulsory components of EPP

Legal bases of sustainable development of rural areas. The educational unit is aimed at developing students' skills and competencies necessary for professional activities on the basis of an integrated approach to rural development. It allows one to form an idea of theoretical and practical legal support problems in economic, environmental and social components of sustainable rural development.

Environmental policy and EU law. The task of the educational unit is to clarify the peculiarities of the knowledge system formation regarding the current state of environmental policy, legal regulation of the European Union environmental relations.

Contract law. Contract law is traditionally defined as a system of legal norms contained in the Civil Code of Ukraine, other acts of legislation and norms-requirements placed in other sources of law, that establish rules and procedures for concluding a contract, content of a contract, procedure of fulfilling contractual obligations, legal consequences of improper performance (non-performance) of contractual obligations and ways to protect violated rights of the contract parties.

Legal regulation of information relations. The purpose of studying the educational unit «Legal regulation of information relations» is to provide students with comprehensive knowledge on the topic of the state information policy and the modern information society.

Optional components of EPP
Free choice according to specialty

Agrarian law of foreign countries. The educational unit is aimed at the formation of critical scientific thinking of students, skills and competencies necessary for professional activity on the basis of understanding the main trends in foreign agricultural legislation. It allows one to form an idea of the agricultural legislation system of the European Union, leading European countries, the United States and the post-Soviet legal space.

State registration of land plots and rights to them. In the process of studying this educational unit, students will be offered a survey of Land Cadastre legal nature, management relations in the State Land Cadastre field, features of legal regulation of its

individual components, legal support of state land registration, and liability for violations of State Land Cadastre legislation.

European Environmental Law. Within the framework of the educational unit, one will in-depth study the peculiarities of the legal regulation of certain areas of the European Union's environmental policy: the policy in the field of waste management, water protection policy, in particular. The best practices for the implementation of EU environmental policy in the individual state member are considered.

European Energy Law. In terms of the educational unit one will study the process of formation, current status and trends in the regulation of the European Union`s energy relations. One will study the legal regulation of the energy market, the regulatory and legal support for the renewable energy development. Particular attention is paid to Ukraine and EU cooperation in the field of energy.

European Climate Law. The educational unit aims to provide students with basic knowledge about climate policy and EU law, the place of EU climate law in the general system of European law, the EU emissions trading system. One will study the legal regulation of certain areas of EU climate policy. Special attention is given to the EU Strategy on Adaptation to Climate Change, priority measures on adaptation to climate change in the European Union and to climate diplomacy.

European General Food Law Regulation. To ensure the implementation of the Association Agreement between Ukraine and the European Union, it is necessary to carefully study and adopt the experience of EU member states, as well as to train a new generation of professionals capable of effective implementing the EU food policy in Ukraine.

Protection of environmental rights. The purpose of the educational unit is to acquire and deepen knowledge about the system of environmental rights and responsibilities of citizens, guarantees of implementation and ways of protection the environmental citizens` rights; to promote the obtaining of theoretical knowledge by students and to assist the formation of their practical skills and abilities to independently solving practical problems that arise in the process of implementation and protection of environmental rights.

Intellectual Property Protection Rights to Plant Varieties. The basis of the educational unit is an in-depth analysis of the ways to protect intellectual property rights to plant varieties and to study the practice of such civil disputes application by courts of Ukraine.

Competition law. The educational unit is aimed at studying the economic competition law, protection of economic relations participants from the manifestations of unfair competition. It allows master's students to form a system of knowledge on legal competition regulation and monopoly restriction.

Corporate lawyer. Teaching forms and methods of this educational unit are aimed at conducting a legal analysis of juridical structures used in the practice of a corporate lawyer; studying theoretical and practical issues arising during the operation of a legal service (law department), law firm or self-employed lawyer and provided relevant services.

Migration law. The purpose of studying the educational unit is for future lawyers to master theoretical knowledge and to form practical skills and abilities to independently solve practical problems related to internal and external migration; to thoroughly and comprehensively study the origin and development of legal regulation of migration process in Ukraine.

International environmental law. The educational unit involves studying of global environmental problems, concepts, matter, objects, methods, subjects, system, principles, sources, institutional mechanism, formation and development of international environmental law, environmental human rights and international legal mechanism for their

protection, responsibility in international environmental law and the implementation of international agreements on environmental protection, international legal protection of ambient air, climate and near-Earth space, marine and freshwater environment.

International economic law. The purpose of the educational unit is to form knowledge about international economic law, its features, major industries and institutions; to acquire theoretical and practical knowledge and skills on the role and application of sources of international economic law in Ukraine.

International Energy Security Law. Energy is a key economic sector for many countries in the world in economic, social and political terms. At the end of the twentieth century, cooperation in the energy sector intensified markedly, especially after the crises that caused serious shocks in the world economy. The desire to solve these problems has led to a significant intensification of international energy policy on a global and regional scale. Energy security is largely determined by the state of global energy markets, which are becoming increasingly global. Currently, there is a development of a competitive environment in these markets, which leads to further intensification of international companies and intensification of the struggle between them. At the same time, interstate cooperation in the energy sector is being strengthened in order to avoid sharp price fluctuations, prevent destructive competition, and ensure stability and predictability in the market. The economic well-being and political stability of the world community depend on the development of these processes. The issue of energy security came to the fore in discussions at multilateral global and regional forums.

International Nuclear Security Law. The use of nuclear energy for peaceful purposes opens up extremely wide opportunities for improving the well-being of humanity. However, the increase in the number of scientific and industrial nuclear reactors, the intensification of trade in nuclear materials and their transportation, the disposal of spent nuclear fuel pose a potential threat of radioactive contamination of humans and the environment. However, due to its physical and chemical properties, radioactive contamination poses a danger to states that may be located far from the borders of the country where the nuclear incident occurred. The example of the greatest man-made catastrophe of the XX century, which occurred at the Chernobyl nuclear power plant in 1986, is a clear confirmation of this. These circumstances call for the joint efforts of the entire international community to ensure the safe development of nuclear energy and prevent the negative consequences of using the atom for peaceful purposes.

Patent law. The purpose of the educational unit is to for students to acquire certain amount of knowledge on the legal protection of rights to inventions, utility models and industrial designs, as well as to apply this knowledge and skills in practice.

Environmental safety law. The educational unit is aimed at deepening students' theoretical and practical knowledge on various aspects of environmental safety as a complex environmental law sub-branch and academic discipline. It aims for students to form practical skills and abilities to apply relevant legislation in actual practice of human rights, law enforcement, scientific and other types of legal activities.

Law and the state of sustainable development. The new worldview paradigm, on which the Sustainable Development Strategy is based, is a political and practical model of such development in all countries of the world that meets the needs of the current generation without compromising the ability of future generations to meet their own needs.

Legal regulation of social guarantees of military personnel. The educational discipline "Legal regulation of social guarantees of military personnel" is aimed at forming master's students' knowledge about the features of social security of military personnel and their family members. As well as identifying problems in providing social assistance to military personnel and researching ways to solve them. Social protection of military

personnel is an activity (function) of the state aimed at establishing a system of legal and social guarantees that ensure the realization of constitutional rights and freedoms, meeting the material and spiritual needs of military personnel in accordance with the special type of their official activity, status in society, maintaining social stability in the military environment This is the right to support them in case of total, partial or temporary loss of working capacity, loss of a breadwinner, unemployment due to circumstances beyond their control, in old age, as well as in other cases provided for by law. The subject of the academic discipline is social relations that arise in connection with the social security of military personnel and members of their families.

Legal bases of ecological management. The educational unit aims to deepen students' theoretical and practical knowledge about the legal nature of environmental management as one of the environmental management types; promote the acquisition of theoretical knowledge by students and the formation of their practical skills and abilities to independent solving practical problems that arise in the process of environmental enterprise management.

Commercial Litigation Concerns. The educational unit is built in a way to ensure a consistent and logical material presentation, revealing the current problems of commercial litigation. The content of the economic procedural legislation is revealed.

Problems of preventing and combating corruption. The purpose of the educational unit is for students to form and develop a set of professional knowledge on the theoretical foundations and practical aspects of modern legal relations regulation in the preventing and combating corruption field; to understand the system of anti-corruption bodies, their tasks, functions and division of powers.

Property rights problems. The educational unit is aimed at deepening knowledge about property rights, forms of ownership and judicial practice of resolving property disputes. It aims for future specialists to master the theoretical foundations and problematic issues regarding the legal nature and content of property rights, analysis of legal and judicial practice on the application of current legislation in the field of property rights protection.

Food Law. The education component is aimed at forming skills and competencies necessary for providing Master`s professional activity on the principle of an integrated approach for understanding of an Food law as an agrarian legal institute. Allows to form an idea about theoretical and practical problems related to ensuring food security of the country. Provides an idea of social relations that arise, change and stop in the process of production and circulation of safe food products, including organic ones. Particular attention is paid to the consideration of problems related to the legal regulation of the handling of GMOs. The presented theoretical and practical material encourages new scientific research and develops students' critical scientific thinking.

ECHR decisions in national proceedings. In the process of studying the educational unit, students will be able to thoroughly analyze which provisions of the Convention on Human Rights and Fundamental Freedoms, as well as its Protocols, are used by courts in Ukraine.

Judicial lawmaking. The educational unit is devoted to the study of the main theoretical and practical problems of legal regulation of judicial lawmaking. As a result, students will acquire skills and abilities to use technical and legal means and technology-based procedures of regulatory and precedent judicial lawmaking technology, which are used in the process of creating court regulations and judicial regulatory cases, as well as giving them legal force.

Current problems of the judiciary system in Ukraine. Today the problem of judicial reform in Ukraine is quite relevant, as the most important prerequisites for the democratic state`s development are qualitative, stable legislation and effective justice

system, which can really provide reliable protection of human rights and freedoms, as well as public and state interests protection. It is important to study and theoretically comprehend the new stages of reforming the Ukraine`s judiciary system, bringing it closer to international standards for effective improvement and practical application.

Theory and practice of criminal-legal qualification. The subject of study of the academic discipline is the general provisions of the theory of criminal-legal qualifications and the basis of their practical application in the agricultural sector. The purpose of studying the academic discipline is the formation of students' knowledge about the concepts, grounds and principles of qualification of criminal offenses, as well as the issue of qualification of certain types of acts provided for by the Criminal Code of Ukraine; instilling the ability to correctly apply the knowledge obtained during the study of criminal law and other branches of law in the process of criminal law qualification; fostering respect for the criminal law as an important means of protecting the rights, freedoms and legitimate interests of a person, the interests of society and the state against criminal encroachments. The main goals of studying the discipline are the students' acquisition of general and professional competences in establishing the correspondence (identity, identification) of the elements of a committed socially dangerous act with the elements of a criminal offense provided for by one or another criminal law norm.

Consumer rights protection. The educational unit is designed for the second (master) level students to form a holistic view of the legal, socio-economic prerequisites of consumerism; to study the main stages of its development, characteristic features, tasks, directions of activity, to find out the place and role of consumer relations in the market economy system; to determine the main activities of state structures along with public associations and the organization principles of economic entities control in the consumer protection field.

Values and the Law. This educational unit is devoted to the study of law values together with law itself as a value; to the conflict of values, defining values and development priorities in the XXI century, clarifying the basic values of the European Area, establishing their interaction with civil society and government.