

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

**BACHELOR CURRICULA  
AND  
TRAINING PROGRAMS**

**2019-2020  
academic year**

**2019**

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# **1. General Information About The National University of Life and Environmental Sciences of Ukraine**

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### 1.1. Historical brief

National University of Life and Environmental Sciences of Ukraine is the university of the IV accreditation level with the status of self-governing (autonomous) research university.

Since 2014, NULES of Ukraine is headed by Rector Stanislav Nikolaenko, corresponding member of National Academy of pedagogical Sciences of Ukraine, doctor of pedagogy, professor.

The history of the National University of Life and Environmental Sciences of Ukraine originated from Agricultural department and Veterinary faculty of Kyiv Polytechnic Institute, Department of Forestry of Agricultural Institute in Marimont (Poland).

The agricultural department of Kyiv Polytechnic institute (opened in August 31, 1898) transformed into Agricultural (Agronomic) faculty in 1918, and later in 1922 into Kyiv Agricultural Institute. In 1923, it became an independent higher educational institution.

The first dean of the agricultural department was M.P. Chyrvynskiy, Master of Agriculture, State Councilor, Honorary Professor and Head of zoo breeding technologies department. His achievements contributed to the national science treasury. The honorary fellow and lecturer of the agricultural department was K.A. Timiriaziev, professor emeritus of the Imperial Moscow University.

The first 32 scientists-agronomists graduated in 1903. D.I. Mendelejev, a famous scientist and chemist, an honorary fellow of the popular Kiev society of naturalists was the Head of the State Examination Board. He appreciated the high level of graduates' knowledge.

In 1926-1929, architect D.M. Diachenko designed the first educational buildings in Golosiievo in the style of Ukrainian Baroque.

In 1926, Kyiv Agricultural Institute was the leading institution of agricultural science and agronomic education in the central part of Ukraine. The People's Commissariat of Education, as official documents certify, planned to transform KAI into the higher agricultural school of USSR - Ukrainian Agricultural Academy. Subjective and objective reasons prevented the realization of this project.

In the first half of the 1930s, a number of independent institutions operated on the bases of KAI. However, in the mid 1930s the institution regained its name and structure.

During World War II KAI evacuated to Alma-Ata and functioned as part of Kazakh Agricultural Institute.

In 1948, on its 50th anniversary, the institute was awarded with the Order of the Red Banner for outstanding achievements in teaching and research work.

Kyiv Forestry Institute began its history from the Warsaw forest school which affiliated with Institute of Agriculture in Marimont (Poland, 1840), and the latter was reorganized into the Institute of Agriculture and Forestry. In 1862, it transferred to Novo-Alexandriya (now - Pulawy, Poland). At the beginning of World War I (1914), a number of faculties of Novo-Alexandriya Institute of Agriculture and Forestry incorporated into Kharkiv Institute of Agriculture and Forestry (since 1921). In 1930, Forestry Faculty of Kharkiv Agricultural Institute moved to Kyiv and affiliated with Forestry engineering faculty of Kyiv Agricultural Institute to become the Ukrainian Forestry Technical Institute, and the same year it reorganized into Kyiv Forestry Institute.

In 1954, Kyiv Agricultural Institute and Kyiv Forestry Institute merged into the institution "Ukrainian Agricultural Academy of the Order of the Red Banner" (the UAA).

In the 1950s, the UAA was not only the major staff-training center for agriculture in Ukraine, but also the center of its scientific support. From 1956 to 1962, the Ukrainian Agricultural Academy became an educational department of the Ukrainian Academy of Sciences (UAS). This period became one of the most fruitful in the history of the institution, since there was a real possibility of integration of education and research activities, which

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made the institution famous in the former USSR. This was the prototype of large education and research universities functioning in highly developed countries of the world.

By the willful decision of the Government, the Ukrainian Academy of Agricultural Sciences liquidated due to consistent upholding of the strategy of agricultural development by the Presidium of the Ukrainian AAS, which did not coincide with the official opinion. The research institutes reassigned to the All-Union Academy of Agricultural Sciences named after Lenin and Ministry of Agriculture of USSR.

In 1957 Kyiv Veterinary Institute was joined to UAS, the Institute began its work as a veterinary faculty of Kiev Polytechnic Institute (1920), and since 1921 it functioned as an independent Kyiv veterinary and zoo technological Institute. Kyiv veterinary institute has functioned since 1930.

The 1960-80s were the period of developing international relations. During this time, over two thousand foreigners from more than 100 countries of Asia, Europe, Africa, Indochina and Latin America graduated from the academy.

The university developed its research activities, founded world famous schools led by famous scientists. The teaching staff significantly improved forms and methods of training specialists for agriculture and carried out research on current economic problems in the agricultural sector of Ukraine.

In 1982, the Ukrainian Agricultural Academy established Vinnytsia affiliate branch, which in 1991 became an independent institute (now - Vinnytsia State Agrarian University).

From 1962 to 1992, the educational institution was functioning as an autonomous Ukrainian Agricultural Academy, subordinated to the Ministry of Agriculture of the USSR, and later - the USSR.

Acquiring the experience of highly developed countries in the field of higher education, active collaboration with leading agricultural educational institutions, participation in the reform of higher education in Ukraine in the framework of the Bologna process have led to the qualitative changes in the structure and functioning of the institution, resulting in the change of its status and title.

In August 1992, the Ukrainian Agricultural Academy transformed into the Ukrainian State Agrarian University and got the status of National University according to the resolution of the Verkhovna Rada of Ukraine No. 158 from July 29, 1994. Since that time, it existed as the National Agrarian University and according to the above resolution of the Verkhovna Rada of Ukraine and the resolution of the Cabinet of Ministers of Ukraine No. 387 from June 1, 1995 it was subordinated to Cabinet of Ministers of Ukraine.

The structure of the university included a lot of education and research institutions and production subdivisions as entities that later were reorganized into separated subdivisions.

Since 1936 the University has incorporated Boyarka Forest Research Station, since 1957 – training and research farm "Vorzel", since 1966 - Agronomic Research Station (Kyiv region), since 1972 - Velykosnitynka training and research farm named after O.V. Muzychenko.

In 1996, according to the resolution of the Cabinet of Ministers of Ukraine from April 23, 1996 № 448, Nizhyn Agricultural College (Chernihiv region) joined National Agrarian University.

According to the Resolution of the Cabinet of Ministers of Ukraine from 29 May 1997 № 526, Berezhany Agricultural College (Ternopil region), Zalishchyky (Ternopil region) and Boyarka (Kiev region) agricultural colleges, Nemishaivo agricultural college and Irpin Economic College (Kiev region) joined the NAU.

Eventually, according to the results of accreditation, Irpin, Nemishayevo, Zalishchyky and Boyarka Technical Schools received the status of colleges.

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According to the Resolutions of the Cabinet of Ministers of Ukraine from 6 May 2001 No 434 and from May 16, 2001 No 508, Berezhany and Nizhyn agrotechnical institutes were organized. According to the order of Cabinet of Ministers of Ukraine from August 8, 2001, № 327 of the Ministry of Agrarian Policy of Ukraine the Institute of post-diploma education of managers and specialists of AIC was transferred to the National Agrarian University. Since 2003, the Ukrainian laboratory of quality and safety of AIC products was organized in the National Agrarian University. In 2004, the property complex of state poultry breeding plant named after Frunze (Crimea) was transferred to NAU as training and research farm. The same year, on the basis of the Crimean State Agrotechnological University it was decided to organize the Southern Filial «Crimean Agrotechnological University" (Simferopol), Crimean Agroindustrial College, Bakhchisaray Construction College; Prybrezhne Agricultural College, College of hydro melioration and mechanization of agriculture. In 2004 the Ukrainian Research Institute of Agricultural Radiology" joined the National Agrarian University.

In 2005, Bobrovytsia College of Economics and Management named after O. Mainova (the present name of the college) joined the National Agrarian University. In 2007, Mukacheve Agricultural College joined the University.

In 2015, the university organised interdepartmental laboratories on the basis of Tarashcha agrotechnical college, Malyn and Lubny Forestry Colleges, SS of NULES of Ukraine - Mukacheve Agrarian College, Bobrovytsia College of Economics and Management University named after O. Mainova, and Berezhany Agrotechnical Institute.

Since 2016, "Rivne College of NULES of Ukraine" has become the separated subdivision.

In the field of international cooperation the university signed agreements on collaboration with a lot of educational and research institutions worldwide.

To expand the educational, research and innovation activities of the National Agrarian University and to satisfy the needs of agricultural, environmental and other industries, as well as to adapt these activities to the requirements of international organizations of research universities, National Agrarian University was renamed into the National University of Life and Environmental Sciences of Ukraine (NULES of Ukraine) by the Resolution of the Cabinet of Ministers of Ukraine № 945 from October 30, 2008, and in 2010 it received the status of self-governing (autonomous) research national university.

Reforming of the university has been clearly outlined in the Program of development of NULES of Ukraine for 2015-2020 "Holosiivska Initiative - 2020". The realization of the Program is to consolidate training, research, innovation, information, advisory, educational and production activities. Thus, the achievements of the University testify that NULES of Ukraine is a prime example of the institution of the 21st century.

## 1.2. The concept and objectives of educational activities

**The concept of educational activities of the National University of Life and Environmental Sciences of Ukraine (NULES of Ukraine)** is determined by its **status as a research university**. It conducts educational, research, scientific, innovation, production and consultancy activities aimed to develop modern approaches to problems of life and environmental sciences, the use, reproduction and sustainable development of biological resources in soil and aquatic ecosystems, introduction of new environmental agrobiotechnology, technologies of soil safety and fertility, energy saving agricultural technologies, environmental and legal management in rural areas, monitoring and enforcement of standards, quality and safety of agricultural products, processing technologies and the environment.

The University aims to meet the educational needs of individuals, society and the state in accordance with the Constitution of Ukraine, Laws of Ukraine "**On Education**", "**On Higher Education**", "**Regulations on organization of the academic process in National University of Life and Environmental Sciences of Ukraine**".

NULES of Ukraine as a research university conducts its activities in accordance with the European scientific and educational requirements and standards, participates in research programs and projects, including international cooperation with leading foreign universities and authoritative overseas partners.

Educational activities at the university are secular in nature, independent from political, civic and religious interference. The main objective of the university is to further integrate into the global educational system and achieve the international status.

NULES of Ukraine is a higher educational institution of the IV accreditation level and enjoys the right to train specialists in the following educational and qualification levels:

- Junior specialist – 25 specialties;
- Bachelor – 40 specialties;
- Specialist – 13 specialties;
- Master – 37 specialties and more than 60 educational programs.

The basic institution of the University (Kyiv) implements the degree system of training "bachelor – master". In addition, the university offers training for candidates and doctors of sciences in 34 specialties, as well as retraining and advanced training of specialists for the agricultural sector.

Over 31,000 students study at 13 faculties and 3 education and research institutes (ERI) of the basic institution of the University (Kyiv) and 11 separated subdivisions of NULES of Ukraine – regional higher educational institutions of II – III accreditation levels.

**The concept of educational activities at the university is grounded on the following principles:**

- access to higher education for individuals who meet the requirements of professional selection (competition) considering the existing benefits for rural youth and those living in the areas contaminated as a result of the Chernobyl catastrophe;
  - equality of conditions for any student, learner, postgraduate, doctoral candidate in order to realize their abilities, talent, all-round personal development;
  - transparency of higher educational institution, creation of preconditions for selecting the specialty and form of training;
  - the priority of universal spiritual values, humanism and democracy in the academic process;
  - logical unity and continuity of the academic process and its integration with science and production;
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- correspondence of the educational level to the international requirements;
- open competition and contracts for vacancy positions of heads of departments, deans, professors, associate professors and other employees.

**The main objectives of the educational activities at the university are:**

- organization of the academic process through innovative master and postgraduate programs of advanced scientific and professional training of masters, candidates of sciences (Doctors of Philosophy) and doctors of sciences for scientific and pedagogical activities at universities, research institutions and high-tech science-intensive industries;
- introduction of training for masters and PhDs, teaching and research staff of the University on the basis of personal research activities through close integration of research activities with the academic process and providing in-depth fundamental component in teaching and research;
- strengthening and effective use of human resources, scientific, educational and research potential of the University through carrying out efficient, high-level research and training process;
- development and implementation of new integrated technologies, methods, technical means into the training process;
- integration of education with science and industry in the framework of the educational, scientific and production associations (including interdisciplinary), basic departments, their subdivisions in the institutions of the NAS and NAAS of Ukraine and other academic institutions for teaching and research;
- staff training for innovative development of Ukraine on the basis of creativity, information technology competence, methods of development, use and protection of intellectual property, basics of innovation management, marketing, product innovation, commercialization of scientific and technological developments;
- ensuring a high level of employment for graduates, young scientists with advanced scientific, research and technical training as scientists, university lecturers, developers of new techniques and technologies, managers of scientific and technological business and public administration in education, science and technology;
- involving students into research, development and implementation of complex scientific and technical knowledge intensive systems as a component of the academic process;
- ensuring high requirements for competitive selection of the teaching staff taking into consideration their scientific achievements;
- development of a virtual educational and scientific information environment by involving all academic and research subdivisions of the University and ensuring the access of all participants of the academic process to it;
- advanced training of managers and professionals of organizations, enterprises and institutions who carry out research and implement the results of technological achievements of the University;
- promoting the spiritual and cultural development of society, shaping the country's knowledge base, developing high-tech industries and innovative business environment.

**The academic process at the University is based** on a systems approach to foster students' broadmindedness, original thinking and ability to solve industrial and socio-economic problems.

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The educational process is an integral part of academic activities and provides education of future professionals in the best traditions of national and world culture based on common priorities, renewal and development of the national economy, culture, science and spiritual unity of the nation and the people living in Ukraine.

One of the key areas of strategic objectives of the University is development of a new mechanism of interaction of all participants in the academic and educational process, based on respect for the principle of the unity of their interests, educational opportunities and personality needs.

**The main objectives of the academic and methodological activity in the context of implementation of degree education system are:**

- development of a professional of XXI century model and the requirements to the level of professional knowledge, capacity for self-learning, flexibility in market conditions and self-development;
- involvement of the University staff into the scientific-methodological commission of the Ministry of Education and Science of Ukraine and the Ministry of Agrarian Policy and Food of Ukraine engaged in improvement of organizational and methodological support of the academic process, developing branch standards for higher education;
- creation of scientific-methodological complexes in the fields of training (specialties) and discipline teaching methods based on advanced educational technologies and related educational and laboratory facilities;
- compliance with the state standards of higher education;
- adaptation of scientific and methodological literature written by the University staff to the requirements of international standards of WTO and the European Union;
- determining the content and forms of academic activity for various stages of training and certification;
- identifying the content and character of graduates employment in order to make amendments and additions to the content of curricula and organization of the academic process;
- development of guidelines and forms of rating system, assessment criteria, tests to determine the level of professional knowledge, competences and skills;
- development of new information and communication systems to support the academic process.

### 1.3. Specialties for Bachelor's degree

The National University of Life and Environmental Sciences of Ukraine trains bachelors in the following specialties:

*Accounting and Taxation; Agricultural Engineering; Agronomy; Automation and Computer Integrated Technologies; Biotechnology and Bioengineering; Computer Engineering; Computer Science; Construction and Civil Engineering; Cybersecret; Ecology; Economy; Entrepreneurship, Trade and Exchange Activities; Finance, Banking and Insurance; Food Technologies; Forestry Management; Geodesy and Land Management; Heat power engineering; Horticulture and Viticulture; Hotel-restaurant business; Sectoral engineering; International relations, social communications and regional studios; Journalism; Law; Management; Marketing; Park and Gardening Management; Philology (Germanic languages and literature (translation included)); Plant Protection and Plant Quarantine; Power Engineering, Electrical Engineering and Electrical Mechanics; Professional Education; Psychology; Social Work; Software Engineering; Technology of Production and Processing of Livestock Products; Tourism Transport Technologies (on Motor Transport); Veterinary Medicine; Water Bioresources and Aquaculture; Woodworking and Furniture Technologies.*

**Bachelor's degree** is an educational degree (ED) in higher education that can be obtained by a person at the first level of higher education. The higher educational institution confers Bachelor's degree to a seeker upon completion of educational and professional program (180-240 credits ECTS). The extent of educational and professional program for Bachelor's degree on the basis of Junior bachelor's degree (EQL Junior specialist) is determined by a higher educational institution.

A person can apply for Bachelor's degree training providing he/she has obtained a complete general secondary education.

The first (bachelor) level of higher education corresponds to the sixth qualification level of National Qualifications Framework (the Resolution of the Cabinet of Ministers of Ukraine № 1341 from 23.11.2011) – the structural unit determined by a certain set of competencies typical for this qualification level.

#### Description of the the sixth qualification level

Level	Knowledge	Skills	Communication	Autonomy and responsibility
1	2	3	4	6
6	Ability to solve complex specialized tasks and practical problems in a particular area of professional activity or in the learning process, which involves the use of certain theories and methods of relevant science and is characterized by complexity and uncertainty of conditions.			
	Conceptual knowledge acquired in the process of training and professional activity, including certain knowledge of modern achievements	Solving complex and unforeseen problems in specialized areas of professional activity and / or training, which involves collecting and interpreting information (data), choice of methods and tools, the use of innovative approaches	presenting information, ideas, problems, solutions and one's own experience in the field of professional activity to specialists and non-specialists	Management of complex projects or actions, responsibility for decision-making in unpredictable conditions

1	2	3	4	6
	Critical awareness of basic theories, principles, methods and concepts in education and professional activity		ability to form effective communication strategy	responsibility for professional development of individuals and / or groups  ability to life-long learning with a high degree of autonomy

Educational and professional training program provides obtaining higher education in the field of training (specialty) and relevant qualification.

Educational and professional program is a system of educational components on the first (bachelor) level of higher education within the specialty that defines requirements for education of persons who can start training in this program. The list of disciplines and the logical sequence of their study, the number of European credit transfer-accumulation system (hereinafter – ECTS) required by the program as well as the expected learning outcomes (competences) that the applicant for Bachelor’s degree should master.

Individuals who successfully completed educational and professional training program for Bachelor’s degree and passed state certification, obtain standard documents about higher education in the relevant field of study and Bachelor’s degree qualifications. Bachelors are trained at the faculties of the basic institution of the University (Kyiv) and in separated subdivisions (SS) of NULES of Ukraine - higher educational institutions of II-III accreditation levels (Table 1.1). Training in all subdivisions is realized according to agreed curricula and programs, involving the teaching staff of the basic institution of the university to give lectures at separated subdivisions of the university. This makes it possible to successfully implement a degree system, create favorable conditions for capable students.

**Table 1.1. Specialties for Bachelor’s Degree**

№	Code, Specialty	Departments that provide Bachelor degree training and licensed number (full-time/part-time, persons)	
		Faculties and ERI of the basic institution	SS of NULESU
1	2	3	4
1	015 Professional Education	Humanitarian Pedagogical (50/-)	-
2	035.01 Philology (Germanic languages and literature (translation included), first - English)	Humanitarian Pedagogical (75/15)	
3	035.04 Philology (Germanic languages and literature (translation included), first – German)	Humanitarian Pedagogical (25/10)	-
4	051 Economy	Economic (150/110)	Berezhany agrotechnical institute (40/200)
5	053 Psychology	Humanitarian Pedagogical (75/25)	-
6	061 Journalism	Humanitarian Pedagogical (50/-)	-

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

**Table 1.1 Continuation**

1	2	3	4
7	071 Accounting and Taxation	Economic (150/140)	Berezhany agrotechnical institute (60/60) Nizhyn agrotechnical institute (40/25)
8	072 Finance, Banking and Insurance	Economic (130/90)	-
9	073 Management	Agrarian Management (150/60)	Nizhyn agrotechnical institute (30/25)
10	075 Marketing	Agrarian Management (60/60)	-
11	076 Entrepreneurship, Trade and Exchange Activities	Economic (50/25)	-
12	081 Law	Law (135/115)	-
13	101 Ecology	Plant Protection, Biotechnology and Ecology (75/75)	Berezhany agrotechnical institute (30/30)
14	121 Software Engineering	Information Technologies (50/50)	-
15	122 Computer Science and Information Technologies	Information Technologies (50/50)	-
16	123 Computer Engineering	Information Technologies (50/50)	-
17	125 Cybersecret	Information Technologies (200 - for the term of study)	-
18	133 Sectoral engineering	Construction and Design (170/120)	-
19	141 Power Engineering, Electrical Engineering and Electrical Mechanics	Energetics, Automation and Energy-saving (175/120)	Berezhany agrotechnical institute (75/100) Nizhyn agrotechnical institute (60/60) Nemishayevo Agrotechnical College (50/50)
20	144 Heat power engineering	Energetics, Automation and Energy-saving (200 - for the term of study)	-
21	151 Automation and Computer Integrated Technologies	Energetics, Automation and Energy Saving (50/35)	-
22	162 Biotechnology and Bioengineering	Plant Protection, Biotechnology and Ecology (100/50)	-
23	181 Food Technologies	Food Technologies and Quality Management of AIC Products (100/100)	-
24	187 Woodworking and Furniture Technologies	Forestry, Park and Gardening Management (50/100)	-
25	192 Construction and Civil Engineering	Construction and Design (50/50)	-
26	193 Geodesy and Land Management	Land Management (90/85)	-
27	201 Agronomy	Agrobiology (190/120)	-
28	202 Plant Protection and Plant Quarantine	Plant Protection, Biotechnology and Ecology (75/50)	-
29	203 Horticulture and Viticulture	Agrobiology (60/30)	-
30	204 Technology of Production and Processing of Livestock Products	Livestock and Water Bioresources (125/60)	-
31	205 Forestry Management	Forestry, Park and Gardening Management (215/200)	-
32	206 Park and Gardening Management	Forestry, Park and Gardening Management (175/240)	Berezhany agrotechnical institute (30/30)
33	207 Water Bioresources and Aquaculture	Livestock and Water Bioresources (75/75)	-

**Table 1.1 Continuation**

1	2	3	4
34	208 Agricultural Engineering	Mechanics – Technology (200/200)	Berezhany agrotechnical institute (75/100) Nizhyn agrotechnical institute (75/75) Nemishayevo Agrotechnical College (50/40)
35	211 Veterinary Medicine	Veterinary Medicine (250/-)	–
36	231 Social Work	Humanitarian Pedagogical (50/50)	–
37	241 Hotel-restaurant business	After Diploma Education (200 – for the term of study)	–
38	242 Tourism	After Diploma Education (25/25)	–
39	275 Transport Technologies (on Motor Transport)	Mechanics – Technology (100/100)	Nizhyn agrotechnical institute (30/-)
40	291 International relations, social communications and regional studios	Humanitarian Pedagogical (75/25)	–

Upon completion training and obtaining bachelor's degree graduates have an opportunity to choose a future master program according to the specialties and Master's degree programs.

Preparation of master's degrees is carried out at the basic institution of the University (Kyiv) and at SS of NULESU «Berezhany agrotechnical institute». Master degree training is provided at the basic institution of the University (Kyiv) in 3 educational and research institutes (ERI) and 13 faculties (Table 1.2).

**Table 1.2. Master's Degree Specialties and Educational Programs**

ERI, faculty 1	Specialty 2	Educational Program 3
ERI of Energetics, Automatics and Energy Saving	Automation and Computer Integrated Technologies	Automation and Computer Integrated Technologies
	Power Engineering, Electrical Engineering and Electrical Mechanics	Power Engineering, Electrical Engineering and Electrical Mechanics
ERI of Forestry and Garden-Park Management	Woodworking and Furniture Technologies	Woodworking and Furniture Technologies
	Forestry	Forestry
	Park and Gardening Management	Park and Gardening Management
ERI of After Diploma Education	Management	Extension service Management of innovative activity
Agrobiology faculty	Agronomy	Agronomy
		Agrochemistry and Soil Science Selection and genetics of agricultural crops
	Horticulture and Viticulture	Horticulture and Viticulture
Humanitarian Pedagogical faculty	Management	Management of educational institution
	Educational, Pedagogical Sciences	Pedagogy of higher school
	Social Work	Social Work
	Philology (Germanic languages and literature (translation inclusive), first – English)	English and second foreign language
	Philology (Germanic languages and literature (translation inclusive), first – German)	German and second foreign language
	Economic faculty	Economy
Applied Economics		
Accounting and Taxation		Accounting and audit
Entrepreneurship, Trade and Exchange Activities		Entrepreneurship, Trade and Exchange Activities
Finance, Banking and Insurance		Finance and credit

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

**Table 1.2 Continuation**

1	2	3
Mechanics – Technology faculty	Agricultural Engineering	Agricultural Engineering
	Transport Technologies (on Motor Transport)	Transport Technologies (on Motor Transport)
Faculty of Agrarian Management	Management	Administrative management
		Management of foreign economic activity
		Management of organization and administration
	Marketing	Marketing
Faculty of Veterinary Medicine	Veterinary Hygiene, Sanitation and Examination	Veterinary Hygiene, Sanitation and Examination
	Veterinary Medicine	Veterinary Medicine
Faculty of Plant Protection, Biotechnology and Ecology	Biotechnology and Bioengineering	Environmental biotechnology and bioenergetics
	Ecology	Ecological control and audit
	Plant Protection and Plant Quarantine	Ecology and environmental protection
Faculty of Land Management	Geodesy and Land Management	Geodesy and Land Management
	Economy	Economic cybernetics
Faculty of Information Technology	Computer Science	Information managing systems and technologies
	Software Engineering	Computer ecological and economic monitoring
	Computer Engineering	Information Systems Software
	Construction and Civil Engineering	Computer Systems and Networks
Faculty of Construction and Design	Industrial Mechanical Engineering	Construction and Civil Engineering
		Machinery and equipment of agricultural production
		Equipment of forest complex
		Technical Service of Machinery and equipment of agricultural production
Faculty of Livestock Science and Water Bioresources	Water Bioresources and Aquaculture	Water Bioresources and Aquaculture
	Technology of Production and Processing of Livestock Products	Technology of Production and Processing of Livestock Products
Faculty of Alimentary Technologies and Managing of Quality of Productes of ASE	Metrology and Information and Measurement Technique	Quality, Standardization and Certification
	Food Technologies	Technologies of storage, preserving and reprocessing of meat
		Technologies of storage and reprocessing of aquatic bioresources
Law faculty	Law	Law

## 1.4. Admission requirements

Applicants for full-time and part-time Bachelor degree programmes at National University of Life and Environmental Sciences of Ukraine should meet the current admission requirements approved by the Academic Council of the University.

The educational activity is provided according to the license of the Ministry of Education and Science of Ukraine, serial number AE № 636425 issued 20.05.2015.

### Dates for submitting applications and documents, competitive selection and enrolment for full-time and part-time forms of study by state order

Dates for submitting application		Entrance exams on the basis of		Rating list		Terms for applicants to meet the admission requirements		Enrolment by state order	
CGSE	JS	CGSE	JS	CGSE	JS	CGSE	JS	CGSE	JS
10-22.07. 2019 *		17-22.07. 2019 **	23-30.07. 2019	26.07. 2019 at the latest	01.08. 2019 at the latest	by 18 <sup>00</sup> 31.07.2019	by 18 <sup>00</sup> 06.08.2019	by 12 <sup>00</sup> 01.08.2019 at the latest	by 12 <sup>00</sup> 07.08.2019 at the latest

Note: CGSE – Complete General Secondary Education; JS – Junior Specialist

\* applicants admitted on the basis of the interview, entrance examinations at NULES - by 16.07.2019

\*\* applicants who are interviewed - 17-19.07.2018

**Applicants submit the application form in paper format and the following documents:**

- two copies of personal ID (1st, 2nd pages and place of registration);
- a copy of a state document of previously acquired education (educational qualification) level which meets the requirement for the entry, and a copy of the attachment;
- a copy of the certificate(s) of the Ukrainian Centre for Educational Quality Assessment (for entrants with complete general secondary education);
- 4 colour photos 3x4 cm;
- two copies of personal identification number;
- a copy of military registration card.

All copies of documents submitted by applicants to the NULES of Ukraine shall be certified by Admission Committee. **Copies without the original documents submitted to Admission Committee shall not be considered.**

The Ukrainian passport or the other document identifying a person and citizenship (birth certificate for under-age applicants without passports), military ID (certificate of registration at the recruiting station), standard certificate (original) of education (educational and qualification level) which serves as the basis for enrolment, and the supplement; certificate(s) of the Ukrainian Centre for Educational Quality Assessment and documents certifying the right to apply are submitted by an applicant in person.

Copies of the documents certifying special conditions for an applicant to participate in competitive selection to obtain higher education on the basis of Complete General Secondary Education in accordance with the admission requirements or admission by quotes are submitted in paper format by an applicant in person by the specified date. Applicants who fail to submit in due time the documents certifying special conditions for participation in competitive selection to obtain higher education on the basis of Complete General Secondary Education are not entitled to receive those special conditions.



Applicants for a Bachelor degree on the basis of complete general secondary education applying for full-time and part-time forms of study except the applicants who enjoy the special right for participation in competitive selection according to the results of entrance examinations, enrolment by interview and by quota-1 or have discrepancies in surname, first name, patronymic name, date of birth, gender or citizenship in the identification document, and in the certificate of External Independent Evaluation, **submit an electronic application only**. Applicants may submit up to 7 applications for no more than 4 specialties which allow admission by state order. The number of applications for participation in the competition for study at the expense of individuals or legal entities is not limited.

While filling applications for participation in competitive selection, applicants specify in each application the priority of this application regarding other applications submitted by them, with "1" being the highest priority.

In 2019, the certificates of External Independent Evaluation issued in 2017, 2018 and 2019 are recognized, except grades in English, French, German and Spanish. Grades in English, French, German and Spanish are recognized only in the certificates of External Independent evaluation issued in 2018, 2019.

For the competitive selection of applicants on the basis of Complete General Secondary Education for Bachelor degree, the competitive score is calculated by adding the grades of certificate in competitive subjects (entrance examinations) **(table)**, the average score of the certificate (supplement to the certificate) of complete secondary education or successful completion of preparatory courses at NULES of Ukraine taking into account weighting coefficients specified by the Requirements for admission to NULES of Ukraine.

**List of competitive disciplines in the certificates of the Ukrainian Centre for Educational Quality Assessment (entrance examinations)**

Specialty (Specialization)	Competitive disciplines		
	1	2	3 (chosen by applicant)
Economics ( <i>Economics of Enterprise, Economic Cybernetics, Digital Economics</i> ); Accounting and taxation ( <i>Accounting and Audit</i> ); Finance, Banking and Insurance ( <i>Finance and Credit</i> ); Management; Marketing; Entrepreneurship, trade and stock activity	Ukrainian language and literature	Mathematics	Foreign Language / Geography
Software Engineering; Computer Science; Computer Engineering; Cybersafety; Industry Engineering ( <i>Industry Engineering, Systems and Complexes of Robotics</i> ); Electrical Engineering, Electrotechnology and Electromechanics; Power Engineering; Automation and Computer Integrated Technologies; Construction and Civil engineering; Agroengineering; Transport Technologies ( <i>road transport</i> )			Physics / Foreign Language

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

Agroengineering			Physics / geography
Food Technologies ( <i>Food Technologies, Technology of Health Nutrition Products; Technology Expertise, Quality and Safety of Food Products</i> ); Forestry; Landscape Gardening			Chemistry / Biology
Woodworking and Furniture Technology			Physics / Biology
Geodesy and Land Management			Geography/ History of Ukraine
Psychology			Biology / Foreign Language
Ecology		Biology	Chemistry / Geography
Biotechnology and Bioengineering; Agronomy; Protection and Quarantine of plants; Horticulture and Viticulture Technology of Production and Processing of Livestock Products; Water Bioresources and Aquaculture; Veterinary Medicine; Veterinary Hygiene, Sanitation and Expertise			Chemistry / Mathematics
Professional education (technology of production and processing of agricultural products)			Chemistry / Foreign Language
Journalism; Law; Social work			Mathematics / Foreign Language
Philology (Germanic languages and literature (translation inclusive))			History of Ukraine / Geography
Tourism Hotel and Catering Business	Foreign Language	Mathematics / Geography	
International Relations, Public Relations and Regional Studies		History of Ukraine / Mathematics	
		History of Ukraine	

Individuals who apply for Bachelor programmes on the basis of educational and qualification level of junior specialist are accepted for the first-year course (reduced curriculum) or senior courses (for the program with a prescribed period of study). Competitive selection of applicants is built on the sum of the scores obtained during the entrance examinations at NULES of Ukraine and the average score of the diploma of junior specialist. For specialties: **051 “Economics”, 071 “Accounting and taxation”, 072 “Finance, Banking and Insurance”, 073 “Management”, 075 “Marketing”, 076 “Entrepreneurship, trade and stock activity”**, the competitive score is calculated by the sum of the score for the discipline “Ukrainian language and Literature” indicated in the certificate of External Independent Evaluation (not less than 100 points) and the score for the entrance examination in

selected specialty at NULES of Ukraine.

The applicants who obtained not less than 124 points in the core subject examinations are entitled to participate in the competition in all specialties.

Persons who submitted applications in paper or electronic format participate in the competition for study by state and regional order. After the Admission Committee makes a decision to recommend the applicants for admission in accordance with the terms, they are to meet the requirements for enrolment for study by state and regional order, namely, to submit in person to the Admissions office of NULES of Ukraine the following: the original certificate of education (educational and qualification level) and its supplement, certificates of External Independent Evaluation and/or other documents stipulated by the Admission requirements.

Persons, who failed to meet in due time the requirements for enrolment for study by state or regional order, shall lose the right on enrolment (transfer) for study by state and regional order in the current year.

**Participants of national Ukrainian contests of NULES of Ukraine aimed at vocational guidance of entrants on the basis of complete general secondary education in particular specialties that are given special support, obtain additional points to the certificate of External Independent Evaluation on the related subject within the range of 1 to 20 points, but not higher than 200 points per subject.**

**NULES of Ukraine offers preparatory courses for External Independent Evaluation on the comprehensive subjects. Upon completion the course programme, the participants shall obtain up to 10 additional points when they apply for the specialty, which is given special support.**

The basic institution of NULES of Ukraine (Kyiv) has 14 academic buildings, 13 dormitories, educational-laboratory complexes in several research institutes of National Academy of Sciences of Ukraine and National Academy of Agrarian Sciences, 3 educational-experimental stations, 7 educational and research farms (more than 25 thousand ha in area), a library (more than 1 million books), military training department, driving school, stadium and sports complex.

The students of NULES of Ukraine can also study in 12 separate subdivisions of II-III accreditation levels (for more details, see the University website).

**Applicants submit the documents to the address:**

03041, Kyiv-41, 19, Generala Rodimtseva st., building № 1.

How to get to the Admission Committee:

from the metro station "Lybidska", or "Teremky" take bus 212.

Documents are accepted daily from 9<sup>00</sup> to 18<sup>00</sup>, on Saturday and Sunday- from 9<sup>00</sup> to 14<sup>00</sup>.

lunch break – 13<sup>00</sup> -14<sup>00</sup>

**Phone:** (044) 258-42-63, 527-83-08

(098) 660-08-48; (063) 804-49-93

For more information, join facebook.com/vstupnubip or see the University official website <http://www.nubip.edu.ua>.

### 1.5. Organization of educational process

There are the following forms of studying at National University of Life and Environmental Sciences of Ukraine:

full time studying;

part-time studying (distance);

Forms of studying can combine.

**Full time studying** is the basic form of obtaining a certain level of education. It is carried out in accordance with the Regulation on organization of educational process in NULES of Ukraine introduced by Rector's order № 379 from 30.03.2015.

**Part-time studying (distance)** is obtaining a certain level of higher in-service education and qualification.

**The educational process** in part-time studying (distance) form of studying is organized during a calendar year - during examination sessions and inter-session period, taking into account the benefits required by law for persons who combine work with study.

**An educational process** is a structuralized system of organizational and didactic measures aiming to realize the education content of a certain education and qualification level according to the requirements of the standards for higher education.

Scientific, humanistic, democratic principles as well as the principle of continuity and degree system in education are **the fundamentals of the academic process**. The main objective is to educate and train intelligent and harmoniously developed personalities who are able to extend their knowledge, develop professional mobility and flexibility in the transitional period of reforming the economy of agriculture and forestry.

According to the Law of Ukraine "On Higher Education", NULES of Ukraine implements a **degree system** of higher education "**junior specialist-bachelor-specialist-master**" ("**bachelor-master**" – at the University's basic institution). This system gives a wide range of possibilities to satisfy educational needs and to solve educational problems for a person, increasing universal educational flexibility for professional training and the level of social protection regarding the changes of the needs of the economy and the labor market. It ensures obtaining a desired qualification or extended professional training in specialties and offers correspondent educational and qualification programs.

The regulatory and legislative framework for organization of the academic process at the University is **the Laws of Ukraine "On Education", "On Higher Education"**, the national standards for higher education and standards for educational activity, "The Regulation on the educational Process at NULES of Ukraine", professional educational programs for training qualified specialists of correspondent directions and qualification levels (EQL).

**The content of education** is a scientifically grounded system of the didactically and methodologically framed teaching material for different educational and qualification levels. The content of education is determined by professional and training programs, structural and logical training schemes, curricula for disciplines, as well as other regulative acts of the state administrative and executive bodies for education and by higher educational institutions. The content is reflected in course books, textbooks, methodological materials, references and didactic means. It is also implemented during academic classes and other forms of educational activity.

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**An educational and professional training program** is a list of standard and elective disciplines with the defined number of hours for their studying and forms of control.

**Structural and logical scheme of training** is scientific and methodological substantiation for implementation of an educational and professional training program.

**The main normative document** determining the academic process organization in a specific field of study is a **curriculum** that is implemented by the dean's offices (director's offices of ERI) on the grounds of educational and professional training programs and structural and logical scheme of training and defines the list and the volume of standard and elective disciplines, sequences of studying the disciplines, corresponding forms of classes and their quantity, schedules of the academic process, forms and means of control. The curricula are approved by the Rector of the University and compiled every academic year.

The curriculum distributes the number of hours for disciplines as follows:

– Standard - 60% of the total academic workload of a student (the list of these disciplines, the number of hours and credits are determined by the standards of higher education, requirements of MES of Ukraine within the relevant fields of training (specialties) and are included in the curriculum of training in full);

– Elective:

• offered by the University - 15% of the total academic workload of a student (the list of these disciplines, forms of study (in class or independently) and credits are defined by the academic board of the University).

• chosen by students - 25% of the total academic workload of a student (the list of these disciplines, forms of study (in class or independently) and credits are defined by the working groups formed by the order of Rector of the University, recommended by academic boards of faculties (ERI), approved by the teaching and methodological board of the University as well as by the academic board. They are included in the curricula, depending on the student's choice).

The place of a discipline and its importance, its content and the requirements to the level of knowledge and skills obtained are determined by the course program. The training program of the discipline which specifies the outlines, the sequence, organizational forms and hours, means and forms of current and final control is compiled on the basis of the curriculum and the syllabus of the discipline by correspondent departments.

**The educational process at the University has the following forms:** classes, individual tasks, student independent learning, practical training, and examinations.

Lectures, laboratory research, practical classes, seminars, individual classes, consultations are the main forms of studying.

The classes are organized into semesters (trimesters) according to the annual schedule of the academic process.

Student independent learning is the main form to obtain knowledge and skills in out-of-class time. The hours for student independent learning are regulated by the curricula and should take no less than half the total hours of studying a specific discipline by a student.

**Student practical training** is a compulsory component of the training program for qualification level that aims to help students acquire professional skills. It is held at the independent subdivisions of NULESU educational and research farms and research stations, at advanced modern agricultural and forestry enterprises under scientific supervision of scientific and training staff of the University and experts of the enterprises.

Control includes current control and final control. The current control aims to assess students' readiness to carry out specific tasks during practical classes, laboratory research and seminars. Forms of the current control are determined by the correspondent departments. Moreover, in accordance with the requirements of a module-rating system of training implemented at the University, at the end of each content module there is an obligatory assessment of the level of students' mastering the material.

The final control aims to assess the results of training at a certain education level or at certain completed stages. According to "The Regulations on Examinations and Credits at NULESU", the final control takes two forms: an examination or a credit in a specific academic discipline.

**A Test** is a form of assessing students' laboratory and practical tasks, student knowledge of certain parts of academic disciplines, course projects (papers), educational and practical training activities. Credits in laboratory research tasks and practical activities are to be over before examination sessions start.

**Exam (course exam)** aim to assess students' knowledge of the academic disciplines, their abilities to apply knowledge and skills obtained in order to solve practical problems in their professional activities.

**Exams** are to be taken during the period of examination sessions according to the academic calendar of the University and the schedules of the educational process.

Examination results are scored according to the national four-grade scale – "excellent", "good", "satisfactory", "unsatisfactory". Tests results are scored by the national grades "Accepted" and "Not Accepted".

**Student academic workload** is determined by the number of time measure units for training programs. An academic hour, an academic day, a week, a semester, a course and a year are student academic workload time measure units.

**An academic hour** is a minimum academic student workload unit which takes 45 minutes.

An academic student day lasts no longer than 9 academic hours, an academic week for full time form of studying for ED Bachelor – 30 academic hours (1<sup>st</sup> year); 28 hours (2<sup>nd</sup> year); 26 hours (3<sup>rd</sup> year); 24 hours (4<sup>th</sup> year); for ED "Master" – 18 hours.

One of the peculiarities of the academic process organization at NULESU is a **credit-module system of training** for all training courses and programs of professional training of ED "Bachelor" and ED "Master" witch is regulated by "The Regulations on the Credit-Module System of Education at NULES of Ukraine".

**The principle of module training** consists in dividing the content of each academic discipline in terms of its volume and structure into several content modules. **A content module** is a logically complete part of theoretical and practical material of the academic disciplines containing, as a rule, several lecture themes, practical classes (seminars), laboratory research, calculation problems etc. The number of content modules for one discipline is determined by the lecturer who is responsible for the discipline, and approved

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at the chair meeting. Content modules are included into the curriculum for the discipline.

It is recommended that there be from 2-3 content modules for one discipline within the period of one semester with an obligatory control of the competences gained. The content of each module is learned by students in-class or independently.

Total academic workload (in-class and out-of-class activities, individual tasks, etc.) is measured in hours and ECTS-credits (one ECTS-credit corresponds to 30 hrs.)

**Table 1.5. Ratio between student’s rating and the Ukrainian National grades**

Student’s rating, points	The Ukrainian National Grades	
	Exams, differential tests	Tests
90 – 100	Excellent	Accepted
74 – 89	Good	
60 – 73	Satisfactory	
00 – 59	Unsatisfactory	Not Accepted

An overall student academic workload should be no less than 60 ECTS-credits per academic year, 30 ECTS-credits per semester, and 20 ECTS-credits per trimester.

**Student rating is assessed** after a logically completed part of lectures and practical classes (a content module) for disciplines and during the final control of knowledge and skills. The student assessment rating does not eliminate a traditional grading system. Both assessment systems, being used together, make the assessment system more flexible, objective and promote systematic and active individual student performance during the whole period of studying, ensuring a sound competition among the students in their learning, facilitating students’ development and creativity.

The student assessment rating in academic disciplines, course papers (projects), reports on all training practices (training and production), state examinations, graduation projects (graduation bachelor’s papers, graduation papers (projects) and graduation master’s papers) is scored according to **the 100-point scale**.

The student rating for the academic discipline includes the training rating – 70 points the highest, and the attestation rating – 30 points the highest. Consequently, a content module as part of an academic discipline is scored in 70 points the highest. Rating grades in content modules, as well as attestation rating, are scored according to the 100-point scale.

The student's rating in different types of academic performance in points is transformed into national grades and is recorded into an examination record, a student grade record and a student assessment register (*see Table 1.5.*).

The students having 60 points and more for their academic performance have the right not to take an examination (credit) and to get an examination grade (a credit) "Automatically" according to the number of the points they gained. Points are transformed into national grades (*see Table 1.5.*).

If students want to get a higher rating to get a better grade in an academic discipline, they are to go through a semester attestation. The latter is obligatory to be taken by the students gaining less than 60 points. To be allowed to take an attestation, a student is required to have no less than 60 points for each content module, on the whole, no less than 42 points for academic performance.

The students with a higher academic rating have the following benefits:

- guaranteed workplace after graduating from NULES of Ukraine;
- accommodation and scholarships;
- a choice of the place to have production and training practices;
- training according to individual academic plans and schedules;
- transfer to a new specialty;
- selection for internship abroad;
- advantages in competitive contests for master's degree program.

In order to promote mobility of students and faculty, academic disciplines are taught in the English language at NULES of Ukraine. The majority of disciplines are taught in English for special groups of students in sixteen bachelor programs and the corresponding specialties of master's degree training programs:

- Agronomy;
- Biotechnology and Bioengineering;
- Veterinary Medicine;
- Industrial Mechanical Engineering;
- Geodesy and Land Management;
- Ecology;
- Economy;
- Plant Protection and Plant Quarantine;
- Management;
- Management of foreign economic activity;
- Accounting and Taxation;
- Law;
- Public Management and Administration;
- Social Work;
- Philology;
- Finance, Banking and Insurance.

These programs allow the graduates with proficiency in the English language to adapt quickly to the contemporary requirements of the national and international labor markets, or to continue their education at the leading universities of the world and occupy top positions in different international companies.



Another peculiar feature of the academic process at the University is **a possibility for students with a Junior specialist degree to continue their education on a shortened (up to two years) bachelor's degree training program**, if their specialty is included into the field of study they apply for. There are 23 specialties:

- Automation and Computer Integrated Technologies;
- Agricultural Engineering;
- Agronomy;
- Veterinary Medicine;
- Water Bioresources and Aquaculture;
- Industrial Mechanical Engineering;
- Geodesy and Land Management;
- Ecology;
- Economy;
- Power Engineering, Electrical Engineering and Electrical Mechanics;
- Plant Protection and Plant Quarantine;
- Software Engineering;
- Computer Engineering;
- Computer Science and Information Technologies;
- Forestry Management;
- Management;
- Accounting and Taxation;
- Law;
- Park and Gardening Management;
- Technology of Production and Processing of Livestock Products;
- Transport Technologies (Motor Transport);
- Finance, Banking and Insurance;
- Food Technologies.

According to the results of entrance examinations, junior specialists are enrolled in the first year of studying in a separate batch with the shortened two-year period or the vacant places of the second or third year of studying, the choice of which depends on their academic gap in the curricula (in this case, they study according to their individual plans).

## 1.6. Practical training of Students

Student practical training is a constituent part of the academic process at National University of Life and Environmental Sciences of Ukraine. It is regulated by “The Regulations on Student Practical Training at NULES of Ukraine”, approved by Rector’s Order on 19.10.2015.

**Student practical training aims to** generalize theoretical and practical knowledge, obtain professional knowledge and skills to train qualified professionals with higher education according to the requirements of education and qualification level and ensure high professional training quality.

**The objectives of practical training are:**

to train professionals able to solve production problems in current market conditions, to apply methods and techniques of innovative technology;

to obtain skills in:

making decisions in specific work situations;

implementing advanced technology and scientific findings into production;

team working and cooperation;

a corresponding profession.

Student practical training is a continuous and coherent process going on during the whole period of studying in order to facilitate acquiring certain competences of future bachelors, specialists and masters.

Practical training includes laboratory and practical classes, training and production practices of students.

**Laboratory classes** take place at university laboratories specially equipped with facilities for the academic process (training hardware, machinery, etc.). Laboratories for the students of Technology of Production and Processing of Livestock Products, Veterinary Medicine, Agrobiological, Plant Protection, Engineering for Agrobiosystems, Design Engineering for Machinery and System of Nature, Forestry, Economics, Agricultural Management, Food Technology and Quality and Safety of Livestock Products take place in real professional environment – at educational, research and production laboratories of the educational and research farms of NULESU.

**Practical classes** take place in computerized classrooms or in the University laboratories equipped with necessary technical teaching facilities. Practical training includes teaching materials – tests - to assess the level of students’ knowledge of crucial theoretical principles, a set of tasks of different level of complexity.

**Training practices** are held during the first and second years of bachelor’s degree programs at educational, scientific, production laboratories, clinics, workshops, on the fields of the educational and research farms (ERF) of NULESU, as well as at the leading companies, enterprises, organizations and institutions of Ukraine and other countries that meet the requirements of the educational and professional programs for bachelor’s degree. The practices aim to introduce specific features of the field of study and specialties for the students to be competent in accordance with educational and qualification characteristics, and, in some cases, to get a working profession from a wide range of professions of a corresponding field. Training is supervised by the scientific and teaching staff of the University and the leading specialists of ERF of NULESU. According to the Rector’s order, they are responsible for training practice programs. The practices are also

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supervised by the staff of the student practical training educational and scientific center (SPTESC) assisting to carry out the training programs' tasks.

**Production training** (technological, operational, engineering, teaching, economic etc.) is taken by undergraduates in bachelor's and master's training programs. The training aims to extend and deepen the skills obtained by the students while studying cycles of special disciplines, which helps the students get new skills required to be able to use their knowledge and skills in production. It also aims at improving professional skills and gathering actual material and data for graduation course papers (EQL "Bachelor" and EQL "Master"). Production training takes place at educational and educational- scientific-production laboratories, ERF of NULESU, as well as at the leading companies and enterprises of Ukraine and other countries according to the contracts signed. Training is supervised by the scientific and teaching staff of the department chairs and top managers of farms, enterprises, organizations and institutions. Moreover, the staff of SPTESC assists in production training at ERF of NULESU.

Scientific and research graduation practice is a final stage of practical training and a preparatory period for writing graduation papers (EQL "Bachelor" and EQL "Master"). Students take it during their last year of studying to generalize and improve their skills, to get professional experience and readiness for further independent work, as well as collect data for graduation papers.

#### **Places for student practical training**

Educational, educational-scientific, educational-scientific-production laboratories of the basic institution of NULESU and its separate subdivisions (SS), mainly ERF of the University for labs and classes, as well as training, technological, scientific and research, graduation and other training in Plant Growing, Animal Husbandry, Processing and Storing of Crop Production, Technology for Biodiesel Production, Livestock and Fish Breeding, Methods for Diagnosing and Preventing Animal Diseases, Maintenance Technology, Agricultural Machinery Maintenance and Testing, Forestry, Wood processing, Hunting Industry and its Legal Support, Economics, Accounting, Marketing and Management in agricultural production, etc.

NULESU has its own places for practical training:

2 research stations - SS of NULES of Ukraine "Agronomy Research Station", SS of NULES of Ukraine "Boyarka Forest Research Station" (Kyiv region),

5 educational and research farms - SS of NULES of Ukraine "Velyka Snitynka Training and Research Farmstead named after O.V. Muzichenko", SS of NULES of Ukraine "Training and Research farmstead "Vorzel" and ERF SS of NULES of Ukraine "Nemishayevo Agrotechnical College" (Kyiv region), ERF SS of NULES of Ukraine "Zalishchyky College of Agriculture named after E.Khraplyvyi" and ERF SS of NULES of Ukraine "Nizhyn Agrotechnical Institute" (Chernihiv region);

special places for practical training at regional higher education institution of NULESU of I-II accreditation levels;

Botanic Garden of NULESU.

The total area of agricultural lands under the structures mentioned above is more than 35 000 ha, including approximately 18 000 ha of woods, fields under research, green houses, livestock complexes, automobile and tractor garages, workshops, polygons, manufactories etc.

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The farms of the University are located in different soil and climatic zones of Ukraine – Woodlands, Steppe. The specific features of the practical training places of the University are organization of corresponding departments and their branches, as well as over 80 training-production and training-scientific-production laboratories where the students have laboratory and practical classes, training and production practice, etc.

Bases practical training of students (trainees) of Nulesu is educational, educational-scientific, educational-scientific-production laboratories of basic institution of the University (Kyiv), its subdivisions (OP), and in the first place – NDG University, where he conducted laboratory and practical classes, training, technology, research, undergraduate and other practices in the areas of: crops, livestock, processing and storage of crop production technology of biodiesel production, breeding animals and fish, development of methods of diagnostics and prevention of animal diseases, technology repair, maintenance and testing of agricultural machinery, forestry, wood industry, hunting case and its legal support, Economics, accounting, marketing and management in the sphere of agricultural production.

At **SS of NULES of Ukraine “Agronomy Research Station”**, students study modern technologies for crop production, and take part in raising elite seeds of winter and spring crops, vegetable and fruit elite seedlings. There is a bank of agricultural crop varieties with approximately 300 kinds of wheat, barley, peas, oats, maize, sugar beet, rapeseed, soybeans, potatoes, vegetables, etc. There are also training and production subdivisions of raw processing of crop and livestock products.

There are 5 forestry parks and 2 wood processing manufactures, a botanic garden of the University which has more than 700 kinds of trees and bushes in the structure of **SS of NULES of Ukraine “Boyarka Forestry Research Station”**. These subdivisions of NULESU are perfect training places for the students of the faculties of Forestry and Park, Gardening and Landscape. These students study advanced technologies of forest plantations, forest pests control, forest care, logging and wood processing.

**SS of NULES of Ukraine "Velyka Snitynka Training and Research Farm named after O.V. Muzychenko"** has educational, scientific and production laboratories in crop production and livestock breeding. Wheat, peas, oats, triticale, buckwheat, vetch, sugar beet, rape, maize, potato, vegetables, root crop, annual and perennial grasses are grown there. There is a department of Machinery Testing and Practical Training that provides the agricultural machinery and electrical facilities of the farm with maintenance provided by the students. There are also processing enterprises manufacturing cheese, sausages, pasta and bakery products, and equipped educational laboratories.

The specialization of **SS of NULES of Ukraine "Training and Research farm "Vorzel"** is dairy and meat products. During their training practice, the students study the cycle of breeding aberdeen-angus and Ukrainian black speckled breed of cattle, growing vegetables in greenhouses. Oats, potatoes, vegetables, corn, annual and perennial grasses are grown there.

Training and production practice of the students of **SS of NULES of Ukraine “Berezhany Agrotechnical Institute”** takes place at arboretums “Berezhansky”, “Raivskiy Park”, educational and production station “Garden”, nursery ornamental crops, educational and research laboratories of biogas and biofuel, production workshops.

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At **SS of NULES of Ukraine “Nizhyn Agrotechnical Institute”**, professional practical training is provided by ESF with a laboratory of crop production, a farm with loose boxed cattle keeping and De Laval milking equipment. Barley, pea, oats, maize, rape, annual grasses are grown there.

Agricultural lands, collection and research fields, educational-scientific-production laboratories of mycology, fisheries, livestock, poultry, farm pond (19.6 ha), machine and tractor garage with workshops, operated granaries are the places of the student practical training.

Wheat, oats, potato, vegetables, maize, annual and perennial grasses are grown at **ERF SS of NULES of Ukraine “Nemishayevo Agrotechnical College”**. It also has fish-breeding and fruit processing production units.

ERF of **SS of NULES of Ukraine “Zalishchyky College of Agriculture named after Ye. Khraplivyi”** has a laboratory of ecological expertise, collection and research field, an arch greenhouse for training and production practice of students. Wheat, oats, peas, buckwheat, maize, potato, vegetables are grown there.

**Ukrainian laboratory of quality and safety of agricultural products.** Practical training is carried out for students of (ERI): agrobiological; plant protection, biotechnology and ecology; livestock and aquatic bioresources; veterinary medicine.

The mentioned above ERF are the places where NULESU implements advanced agrotechnologies at the expense of the cooperation with well-known foreign companies: John Deere (the USA), Valtra Valmet (Finland), M&P Farma (Switzerland), ACCO (Denmark), Alfa Laval Agri in Ukraine (Sweden), VUZT (Czech), FML (Germany) that provide the University with advanced technology, equipment, agricultural machinery etc.

The places for student practical training include leading institutions, enterprises, organizations of different ownership in Ukraine and abroad that meet the requirements of the education programs for professional training. The University and ERFs make agreements and draw up passports which are kept in the Academic department and deans' offices. The period of the agreements corresponds the period of a definite practical training or a five-year term.

### 1.7. Teaching and research staff

More than 3 000 of the academic staff ensure the academic process and scientific research at University of Life and Environmental Sciences of Ukraine.

For today in the basic institution of the University (Kyiv) 1357 working scientist, 83 % of them have scientific degrees and academic titles. The average age of the academic staff is 47.

Among the academic staff of the basic institution of NULESU, there are:

- doctors of sciences and professors – 273;
- candidates of sciences and associate professors – 867;
- Academicians of the NAAS of Ukraine – 11;
- Academicians of the NAPS of Ukraine – 2;
- Correspondent Members of the NAS of Ukraine – 3;
- Correspondent Members of the NAAS of Ukraine – 18;
- Correspondent Members of the NAPS of Ukraine – 1;

Honored Workers of Science and Technology of Ukraine – 22;  
Honored Workers of Education of Ukraine – 20;  
Honored Workers of Higher School of Ukraine – 3;  
Honored Inventors of Ukraine – 5;  
Honored Doctors of Ukraine – 1;  
Honored Workers of Veterinary Medicine of Ukraine – 1;  
Honored Workers of Agriculture – 14;  
Honored Workers of Transport of Ukraine – 1;  
Honored Electrical Engineers – 1;  
Honored Constructors of Ukraine – 1;  
Honored Economists of Ukraine – 4;  
Honored Foresters of Ukraine – 1;  
Honored Lawyers of Ukraine – 2;  
Honored Workers of Culture and Sports of Ukraine – 2;  
Honored Masters of Folk Art – 1;  
Honored Artists of Ukraine – 1;  
People’s Artist of Ukraine – 2.

The scientific and academic staff of a higher qualification take post-graduate and doctoral courses. Currently, 383 postgraduate students (including 142 part-time) and 29 seekers are taking postgraduate programs, 23 candidates are doing doctoral programs.

The work of 20 specialized scientific boards on dissertation defense in 49 specialties of 7 Field of Science, of them 16 specialized scientific boards - for a degree of Doctor of Sciences in 43 specialties. Organized and coordinated by the educational and scientific center of training and attestation of the academic stuff of a higher category. The faculty members and postgraduate students submitted and defended 7 dissertations to get a degree of Doctor of Sciences and 76 dissertations to get a degree of Candidate of Sciences in 2018.

In 2018, 17 doctors of sciences joined the academic staff of the University.

### **1.8. Material and Technical Infrastructure**

The basic institution of National University of Life and Environmental Sciences of Ukraine is located in Golosievo, one of the picturesque places of the City of Kyiv.

The university has 17 educational buildings of the basic institution as well as educational, educational-scientific and educational-scientific-production laboratories in separate subdivisions – educational and research farms and research stations – in Kyiv, Chernihiv, Ternopil regions. They have all necessary facilities to provide high quality academic process

There is a modern scientific library with the fund of 1 000 000 books, 400 000 of which are course books, textbooks and reference-books 610 000 – scientific literature; there are 14 residence buildings providing accommodation for approximately 80% of full time students, a canteen, snack bars, etc. Moreover, the educational and research farms

(ERF) and research stations of the University have their own student residence buildings to provide the students doing practical training with accommodation:

Agronomy Research Station –100 people,

Velyka Snitynka Training and Research Farm named after O.V. Muzychenko –110 people,

Boyarka Forestry Research Station – 120 people,

Educational and Research Farm "Vorzel" – 75 people.

The sports complex of the basic institution of the University includes a modern open stadium and a building for physical education and sports.

The Ukrainian Laboratory of Quality and Safety of Agricultural Products, the Ukrainian SRI of Agricultural Radiology, the State Research and Project Institute "Conservpromcomplex" (Odessa) and other facilities form the structure of the University.

There are separated subdivisions at NULESU – 11 regional higher educational institutions of I-III accreditation levels in different regions of Ukraine: Berezhany Agrotechnical Institute and Berezhany Agrotechnical College (Ternopil region), Nizhyn Agrotechnical Institute and Nizhyn Agrotechnical College (Chernihiv region), Irpin' College of Economics, Nemishayevo Agrotechnical College, Boyarka College of Ecology and Natural Resources (three institutions are located in Kyiv region), Zalishchyky College of Agriculture named after E.Khraplivi (Ternopil region), Bobrovytsia College of Economics and Management named after O. Mainova (Chernihiv region), Mukacheve College of Agriculture (Zakarpattia region), Rivne College (Rivne region).

Each institution has its own educational buildings and student residence buildings, some of them having training and research farms, research fields etc.

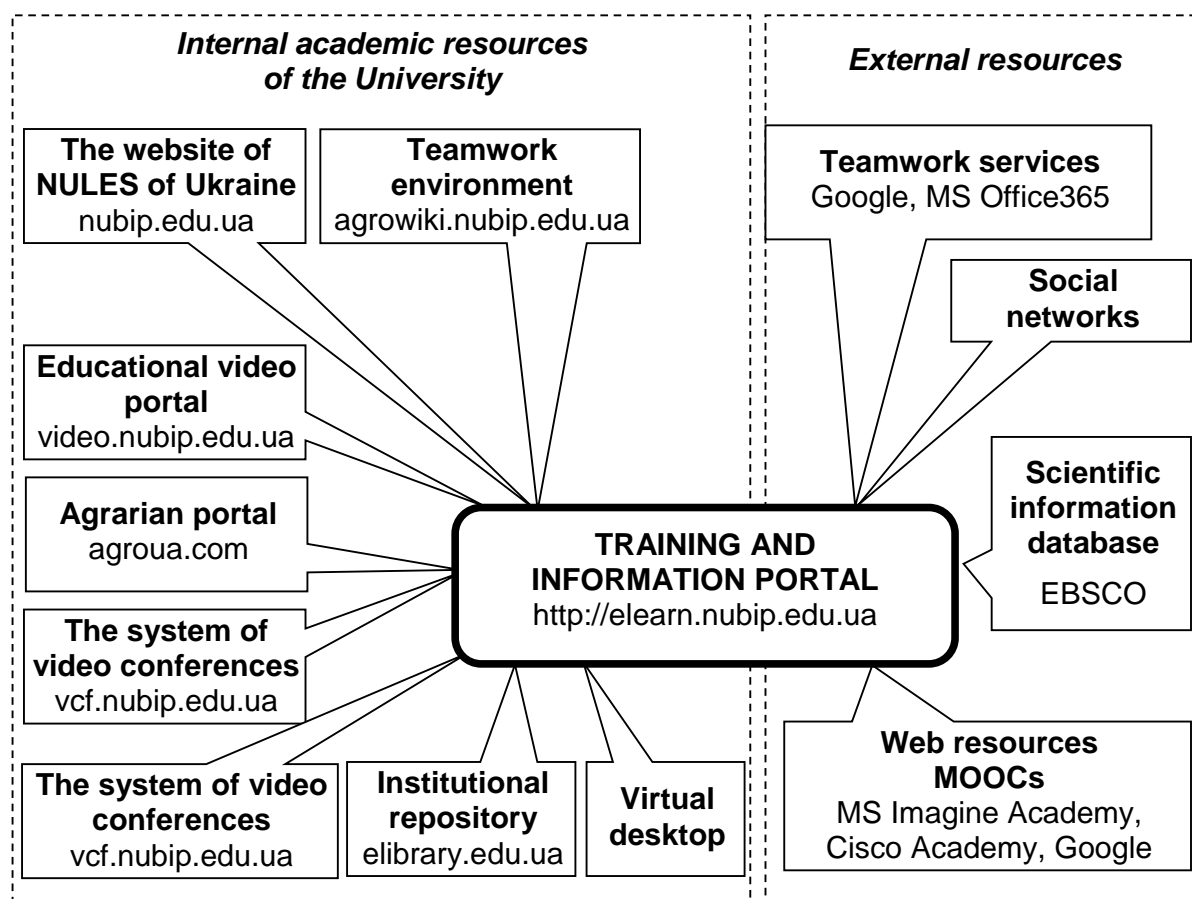
### **1.9. Information and telecommunication support of the academic process**

The main objective of the university – to train highly qualified specialists for the agricultural sector with up-to-date computer knowledge and skills. In order to make efficient use of ICT in the educational process, a corporate information-educational environment (IEE) has been organized at NULES of Ukraine. It includes the following components: well-developed computer infrastructure, software platforms, information and educational resources and a system of IEE management. The university educational cluster functions on cloud-based technologies, and is integrated with MS O365 and Google, where the university has corporate accounts and unified state electronic database on education (USEDE). Hybrid cloud-oriented educational environment of the university has internal resources - educational information portal (platform Moodle), institutional repository (ePrints), video portal, video-conferencing system, conference support system, etc., as well as external resources - Google and Microsoft O365 services to organize teamwork, academic portals Microsoft and Cisco etc. (Figure 1).

The University infrastructure provides students with an access to information and educational resources. On average, there is one computer per 3.4 students at the University. By the end of 2015, the university information system had 3000 computers. They are supported by servers with the licensed software, including licensed Microsoft Enrollment for Education Solutions.

All educational buildings and student residence buildings are connected to the Local Area Network (LAN) with a bandwidth of 1 Gbps in each direction, and there is also a local Wi-Fi network with free access to the Internet.

A web system LDAP Account Manager is used to administer a unified base of users. The Centre of distance learning technologies provided the Ukrainian localization for this system and integrated it into the unified state education base (USEB).



**Fig. 1. Hybrid cloud-oriented educational environment at NULES of Ukraine**

To support teaching activities in information-educational environment the university makes use of the following software platforms:

Learning and Information Portal ([elearn.nubip.edu.ua](http://elearn.nubip.edu.ua)), which contains e-learning courses (ELC) for students at 13 faculties and 3 educational and research institutes. Each academic discipline is supported by e-course with theoretical material and resources for laboratory and practical work, independent work, formative, interim and final control. University experts have developed a standard structure of ELC, its certification, as well as training system for teaching personnel to develop such e-courses;

electronic dean's office management system;

an electronic archive of scientific and educational materials ([elibrary.nubip.edu.ua](http://elibrary.nubip.edu.ua)), which includes electronic copies of papers of the university lecturers, proceedings of the conferences held at the University, abstracts of theses defended at NULESU, Masters' scientific papers and theses, books and teaching guidelines to support the learning process, description of open e-learning courses, patents;



Wikiportal ([agrowiki.nubip.edu.ua](http://agrowiki.nubip.edu.ua)), where scholars, educators and students place thematic articles on the problems of research, standards (Codex Alimentarius, ISO, JMA, BS), portfolios;

Video Portal ([video.nubip.edu.ua](http://video.nubip.edu.ua)), which houses educational videos, video lectures and other video resources produced at the University and used in training, educational and cultural activities;

Library repository on DSpace platform ;

Web-platform for Internet-conferences at NULES of Ukraine on Openconference basis. Internet-conference address is [econference.nubip.edu.ua](http://econference.nubip.edu.ua);

On-line system UNPLAG to check diploma and course works of students, scientific and educational-methodical literature of NPP to identify plagiarism in the text.

In the field of information and computer training, the University maintains cooperation with Ukrainian and foreign IT companies — IBM, Microsoft, Intel, Cisco, 1C, CyberBionicSystematics etc. There are educational laboratories: «1C competence centre», «Microsoft Imagine Academy», «Cisco Academy». To provide students and faculty access to International full-text publications the university subscribed to Scientometrics EBSCO database.

The university closely cooperates with regional educational institutions using the technologies provided by information and educational environment of NULESU. In particular, the university teachers give video lectures to students at the separated subdivisions: "Mukacheve Agricultural College", "Bobrovytsia College of Economics and Management named after O.Mainova ", "Zalishchyky Agricultural College named after Ye. Khraplyvy ", "Berezhany Agrotechnical Institute ", "Irpyn Economic College ", "Nizhyn Agrotechnical Institute". In 2015, during the international conferences held at NULESU, the university provided video support of foreign participants from Poland, Great Britain, the Netherlands etc.

### 1.10. Scientific Library

**User service** for scientific, educational and artistic literature was carried out on 8 subscriptions and in 7 reading rooms as central library and branches of the library in educational buildings No. 1, 6, 10, 11, 12.

In 2018 the number of readers for one registration account amounted to **14878** persons, which issued **1003441** copies of documents.

**Mass and educational work.** In 2018, thematic and other cultural events were organized at the library branches and its departments.

During Vyshyvanka Day there was organized an exhibition-view "Pattern became native Ukraine", the embroidered products of library staff were presented.

The bibliographic surveys compiled by the department staff depicted the actual issues of economics, energy and agriculture: application of nanotechnologies in veterinary medicine, biological protection of plants, intensive branch of agriculture - gardening, energy saving in technological processes and institutions, stock market. On the views "Organic Farming" and "Plant Biological Protection", users were able to know new documents on these topics.

64 articles on this important topic for the society were presented in the thematic review "Selection - fortune, present and future" organized for the International scientific

and practical conference "Selection - heritage, present and future (education, science, production").

The staff of the information and bibliographic department participated in the meeting of the scientific club "selectionist - genetics" devoted to the 110th anniversary of the birth of V.M. Remeslo, before the meeting the club did a book exhibition "Remeslo Vasyl Mykolyovych - outstanding selectionist - genetics " and report on the search scientific sources about the famous scientists of the university and Ukraine. Information about these events was posted on the site of the selection department.

Exhibitions revealing important problems of the present play an important role in literature propaganda. Understanding of the Ukrainian idea, the development of state independence of Ukraine, democratization of the processes of state formation in Ukraine - these issues were revealed in book exhibitions "By the unity" ( Day of Unity of Ukraine), "Way of Nation" (to Constitution Day of Ukraine), "Nightingale's Ukrainian native language "(to Day of the Ukrainian language)," This is my Ukraine day, the new one meets "(to Independence Day of Ukraine) organized by the staff of the service department for scientific and artistic literature.

Familiarity with the most valuable spiritual, cultural and social assets of the Ukrainian people was facilitated by the book exhibitions: "The Wings of Poetry" (to International Day of Poetry), Close Everyone at His Parental Table ..." (to Family Day), "Patterns of the Native Land" (to Ukrainian Embroidery Day).

For students of Pedagogy faculty, a bibliographic review "The Eternal Word of Kobzar" was held. For the first-year students conversation "Source of Information" was held and for all library readers, book exhibitions "Our Call and Insight - Readers" (to Ukrainian Day of Libraries) were presented, which introduced the work of the library.

To the anniversaries of prominent Ukrainian figures and writers, book exhibitions "Steps to future" (110 years since S.P. Koroliov's birth), "Creative way of I. Ogienko" (135 years since the birth), "Poetry of high spirit and majestic beauty" "(120 years since Ye.F. Malaniuk's birth), « Great fable-teller " (190 years since L.I. Hlibov;s birth)," Inspired chronicler of Ukraine "(200 years since M.I. Kostomarov's birth).

Book exhibitions were also designed for all the great dates of the state and public life. To the day of Chernobyl tragedy, a book exhibition "Irradiated by pain" was issued, to the anniversary of Great Victory - "The inexhaustible light of Victory". Independence of Ukraine was marked by the book exhibition "This is my Ukraine day, the new one meets", to Constitution Day - "Way to the Nation". To the anniversary of the foundation and development of cossacks - "Be afraid enemies, be glad Ukraine, because cossack's son is saddle a horse", to the anniversary of Holodomor - "The Black Wing of Holodomor." For the students of the first years the conversation "Give the book the time" was done and for all readers of the library a book exhibition "Treasury of folk wisdom" (to Ukrainian day of libraries), which introduced the work of the library.

In general, in 2018, the total number of information events (reader conferences, debates, bibliographic reviews, thematic exhibitions) amounted to **163** .

**Reference, bibliographic and informational services** of the users of the scientific library were conducted on the basis of the research and teaching work of the university and according to individual applications submitted during the year. Much attention was paid to the topic of master's work, both research and production directions.

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In 2017, the library's information and bibliographic department staff prepared 3 thematic bibliographic indexes and 12 thematic lists. According to the themes of master's thesis, 16 thematic lists were prepared.

For all categories of users 2 bibliographic and information pointers are done :

"Periodicals subscribed to the scientific library for 2018";

"Bulletin of new revenues of literature of the scientific library for 2017-2018"

**Manning and accounting of funds.** Replenishment of fund of the scientific library with new documents in 2018 was carried out on the basis of orders of departments, faculties, Educational and Scientific Institutes and library departments. All documents were counted individually and in total, in the traditional and electronic form.

During the year, only 9632 copies came to the scientific library new documents and general fund by 01.01.2018 amounts to 1028737 copies of documents.

For the manning of fund of the scientific library in the current year was spent 390290 UAH 74 coins (including for the purchase of periodicals in 2018: magazines - 94125 UAH 22 coins, newspapers - 60542 UAH 94 coins), for 2018: magazines for the first half - 29363 UAH 92 coins, newspapers - 85725 UAH 67 coins), 120532 UAH 99 coins were spent on the purchase of modern educational publications.

In 2018 the scientific library received 1010 of 1250 copies. (24 out of 29 titles) of modern teaching aids and textbooks from the university's publishing department, which were recommended for publication by the university's Educational and Methodological Council in 2016 to replenish the library stock at the university's publishing department.

In addition, in 2018 1075 copies (29 titles) were recommended by Educational and Methodological Council for printing in 2018 for the university's funds in the publishing department to replenish the library fund.

From the scientific and methodical centre of agrarian education, the scientific library received 71 copies of textbooks and scientific and methodical literature worth 638 UAH 77 coins. From the publishing centre of NULES of Ukraine, the library received the same documents 1105 copies for the amount of 128775 UAH 35 coins. It was profitable 4078 copies donated educational and methodological literature.

In the reporting year 7 copies were received of foreign documents for the maintenance of the work of the FAO United Nations Depository Library for Ukraine in the amount of 280 UAH 00 coins.

In addition, the library fund was actively replenished with gifts from users and various organizations, in particular publishing houses "Naukova Dumka", "Academperiodyka " of National Academy of Sciences of Ukraine.

**Scientific work.** In 2018 the library staff took an active part in seminars, conferences of library workers.

So in particular, the library staff participated in the following activities:

International scientific and practical seminar "Strategy of development of libraries: from idea to incarnation", Kyiv;

Round table "Copyright in the library area", Kyiv;

The seminar is dedicated to creating a positive image of the library as a communication platform of the society "Advertising of the library - as an instrument for a positive image of educational establishment", Illintsi.

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In addition, the scientific library staff actively participated in seminars organized by the Ukrainian Library Association in order to improve the work of libraries, namely in seminars:

"Development of modern libraries: from the classical library to the library of future";

" Media literacy: modern dimensions";

" Advocacy in sustainable financing support of libraries in conditions of economic instability";

"Scientific library and quality of modern education".

In the reporting year, the scientific library paid an attention to international and science-based databases. Thus, in particular, since December 2017 access to the EBSCO science- based database has been subscribed. Access to the scientific medical journal The New England Journal of Medicine, NEJM («New England Medical Journal - English edition, medical research peer-reviewed journals, publisher - Massachusetts Medical Society, USA. This is the oldest medical journal, which is also the most readable, quoted and influential periodicals on general medicine in the world; and access to the BioOne full-text database. BioOne is a product of the creative collaboration of scientific societies, libraries, academic institutions and private sector. It is a valuable resource for scientists, lecturers and students who collects high-quality publications in the fields of biology, ecology and environmental sciences.

Also, our university was among the 100 Ukrainian universities and research institutions of the Ministry of Education and Science of Ukraine, which, through the state budget, got access to international databases Scopus and Web of Science. In this regard, the scientific library director held 4 training seminars for library staff to familiarize themselves with the work of these science-computer databases. After these workshops, the staff of the information-bibliographic department and heads of the library branches provide individual consultations to the scientific-pedagogical staff and post-graduate students of the university regarding the work of Scopus databases, Web of Science and EBSCO

#### **Informatization of library and bibliographic processes.**

In 2018 the scientific library carried out:

- filling the databases of electronic catalogue;
- introduction and use of barcode-based technologies in automation of library processes;
- filling the database of readers for service in an automated mode;
- formation of the database on the use of electronic resources by the readers of the scientific library of NULES of Ukraine, university, world information resources, international science-computer database EBSCO PUBLISHING etc.;
- filling of the electronic library of NULES of Ukraine with electronic copies of educational and methodological and scientific literature received from the scientific and pedagogical staff of the university, new full-text database of the electronic catalogue BOOKS - "Full texts of educational publications" with access to full texts from the library network and Internet ;
- constantly information is updated at the scientific library (library. nubip. edu. ua ) and at the university library portal (nubip. edu. ua / structure / library);

- reference and information service of users in the mode of electronic counselling was carried out with the help of package application to WEB- IRBIS, "Ask the librarian" (Virtual Help).

The volume of the electronic catalogue in 2017 was 189398 entries.

In order to provide the educational process of the university, modern educational and scientific publications the electronic library of NULES of Ukraine is daily filled.

So, in 2018 1258 electronic copies of the publications came to the scientific library, with the authors having signed 2516 copyright treaties.

It should be noted that the transfer of electronic copies of educational and methodological and scientific literature to the scientific and pedagogical staff of the university was carried out through the conclusion of copyright agreements on the transfer of non-exclusive rights to use the publication (this is the official permission to place an electronic copy) to provide users with access either through the university's local network or through Internet.

In general, by 01.01.2019 the electronic library has **5510** full-text documents.

### **1.11. Educational, sports and social activities, military-patriotic education**

Together with the departments of cultural studies, physical education, Humanities, student government educational work of the University organizes and coordinates TRC educational and social development.

The traditional events University festival "Day of knowledge", international student day, contest "the Beauty of Nubip of Ukraine", the international art festival "Golosiivska vesna", "Donor day" take place annually. The TRC has organized new events: military-sports competitions in fire training "Sniper Nubip of Ukraine", IQ tests, Olympiads among students in new sports, such as paintball, pushups, volleyball on the ground and many others.

The TRC of educational and social development together with the department of pedagogy organizes scientific-methodological seminars for mentors of academic groups of the first courses that help to apply pedagogical methods and techniques aimed at students' team-building.

According to the order of Ministry of Ukraine for Family, Youth and Sports, Ministry of Education and Science of Ukraine, Ministry of Defense of Ukraine, Ministry of Culture and Tourism of Ukraine № 3754/981/538/49 from 27.10.2009 «On the Concept of national and patriotic education of youth", the department of military training organised both in-classes and out-of-class military and patriotic education of students and school children during the morning inspection.

The department of military training traditionally organizes meetings of generations (with Veterans of Department) hours of memory, educational classes (during army trainings), discussions on the topics "Remembrance day", "The heroic deeds are immortal", "The heroes fought for our country." In particular, during the Year of honoring of the combatants in other lands, in January 2014 the staff of the department arranged an Hour of Courage. Students and staff together with the NGO of soldiers - Afghans laid flowers at the monument to soldiers - Afghans.

The TRC initiated sports competitions "UNI-sportsman" among the staff and students of NULES of Ukraine in 15 kinds of sports. In 2015, the University teams in tug-of-war, powerlifting, arm wrestling were organized.

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A permanent commission on monitoring compliance with the internal Rules in the dormitories of NULES of Ukraine has been organized.

Physical education and sports activities at NULES of Ukraine are carried out by staff of the Department of physical education together with the student organization, the Trade Union Committee of employees of NULES of Ukraine led by TRC of educational and social development, by involving students, scientific and pedagogical staff and University employees to go in for physical culture, mass sport and competitive sport.

The University hold annual competitions "Spartakiada" among the students of the faculties in 12 sports, among the residents of dormitories in 12 sports, "Health" among the scientific and pedagogical staff and employees of structural subdivisions in 6 sports.

Teams of the University and individual athletes participate in competitions at various levels: district, city, national, international and repeatedly won prize-winning places.

The University teams and individual athletes participate in competitions at various levels: district, city, national, international, and regularly become prizewinners. In 2012, in order to promote physical fitness and health of young people, the University built an outdoor playground for mini-football with artificial turf. In 2015-2016, the educational building № 9 which houses the Department of physical education, outdoor volleyball court, stadium were renovated up to modern standards.

No less important influence on the education of students, establishing the basis for the formation of personality of a future qualified specialist, and master of the land, fully developed and harmonious personality has a dormitory. It has become a tradition to hold an annual contest for the best Dorm to identify the best mechanisms of the organization of conditions for living, learning and recreation of students.

From year to year improved the quality of living conditions in hostels Nulesu. Living rooms are equipped with hard and soft items, created conditions for self-study: the work of reading rooms in which there is access to free Internet, conducted educational and cultural work. All hostels run laundromats. For sports in the hostels there are sports room, and in adjacent territories of hostels № 1, 2, 6, 8, 10, 11 renovated playgrounds, in front of the hostel № 12 to the Playground. Student organizations faculties, ERI, and boards of student dorms have meetings rooms.

### **1.12. Reserve Officers Training**

Reserve officers training is provided by the department of military training of National University of Life and Environmental Sciences of Ukraine.

The department of military training of NULES of Ukraine was created in 1926, when the position of a military leader appeared in the Kiev State Veterinary and Zootechnical Institute by the order № 33111 of the Military educational institutions from 11.05.1926.

Since 1999, the head of the department of military training is colonel A.A. Yesaulov.

Currently, the Department of Military Training trains students in six military specialties:

- Military use of mechanized formations and units;
- Military use of armoured units, military units;
- Use of vehicle formations and units;
- Maintenance and repair of machines of armoured vehicles;

- Maintenance and repair of electrical and special equipment and automation of armoured vehicles;
- Radiology and veterinary toxicology.

Today, 674 citizens of Ukraine do the training course of reserve officers at the department of military training.

Besides, the department provides training of regular officers for Armed Forces of Ukraine and other military formations in speciality "Veterinary medicine", specialization "Veterinary medicine".

The main tasks of the department of military training of NULES of Ukraine are:

training and advanced training of specialists of different educational and qualification levels for military service under the contract in Armed Forces of Ukraine and other military formations;

military training of students of higher educational institutions according to the reserve officers program;

military patriotic education;

improvement of teaching and material resources.

The Department of Military Training has highly qualified specialists, among them there are veterans.

To achieve its objectives the department conducts training and methodological work, as well as research and scientific-technological activities. The training process consists of lectures, laboratory, tactical, practical classes and seminars, group exercises, tactical training, etc.

Teaching and methodological meetings, scientific conferences and seminars, demonstrations and open classes, pedagogical experiments are regularly held.

Military training department has various educational facilities, including shooting range; computer lab equipped with modern teaching aids (interactive whiteboards, multimedia systems); rooms for tactical, fire and technical training; maintenance station, field veterinary laboratory; library; marching parade, tactical town.

Weapons and military equipment are widely used for training of students and cadets. These are armored vehicles (tanks T-64B, BMP-1, BMP-2, BTR-80), automotive vehicles (UAZ-3151-01, ZIL-130 GAZ- 66, ZIL-131), engineering equipment (mine detectors, training mines), communication means (radios 105m P-and R-123M, tank intercom R-124), battle and training hand firearms. (AK-74M, Machine Guns RPK-74M, PKM and PKT grenade launchers AGS-17 and RPG-7V, pistols PM, SVD sniper rifles, small-caliber rifles and pistols).

Students are trained for 2 years and complete the course with military training session. During the training session students are engaged in physical training, get practical skills in driving tanks and infantry fighting vehicles, repair and maintenance of armored vehicles and do the course of firing with hand firearms.

The department of military training of NULES of Ukraine has all necessary conditions to achieve its objectives.

In 2018, the university graduated 378 reserve officers.

Now the department trains:

First year of study – 261 students;

Second year of study - 413 students.

### 1.13. International mobility

**International mobility** is a process of integration in the field of education that provides an opportunity for students, postgraduates, teaching staff to participate in diverse academic or research programs. The main objectives of these programs are to improve the quality of education, to develop cross-cultural exchange, train future qualified specialists. Participation in mobility programs gives a student the opportunity to receive a quality European education in their chosen specialty, to broaden their knowledge in all fields at of European culture, to feel like a citizen of Europe.

International mobility in NULES of Ukraine is one of the main areas of international activity, which offers its students the exceptional opportunities to obtain quality education, do research or internship, and get experience abroad in the framework of international cooperation. Developing the mobility through the implementation of the mechanism of student exchange and participation in the dual diploma programs, individual grants, the University participates in the processes of internationalization and globalization, develops the training of professionals, highly qualified specialists; supports the social, economic, cultural, political relations and ties with other countries.

Today, motivated students of our University can get the experience in conditions of different system of higher education. Cooperation is based on agreements between NULES of Ukraine and foreign higher educational institutions in different countries according to agreed and approved individual educational plans of students and programs of academic disciplines, and in the framework of intergovernmental agreements on cooperation in the field of education.

Fruitful cooperation with leading universities of the world facilitated the reformation and adaptation of education system of NULES of Ukraine to the requirements of leading universities in the world. The two universities of the United States (State of Iowa – 1996, 2011, 2014 and State of Louisiana – 1998, 2009), University of Ghent (Belgium, 2002) and the University. Humboldt (Germany, 2002) have recognized education system of NULES of Ukraine as corresponding to their requirements.

During period from 2005-2017 memorandums were signed about the possibility of obtaining the double diploma between NULES of Ukraine and universities-partners:

- "International bio-business" in Tokyo agricultural University (Japan);
  - Master of Business Administration in Agriculture (MBA) at the University of applied sciences Weihenstephan – Triesdorf (Germany);
  - Master of Food and Agribusiness (MFA) at the University of applied Sciences Anhalt (Germany);
  - Energy and automation of biological systems" at Warsaw University of life Sciences (Poland).
- «Ecology», «Social pedagogy» - Pomeranian university in Slupsk;  
«Economics and management» - Slovakia agrarian university, Nitra;  
«Quality and safety of products», «Management» and «Computer technologies» – Academy of business (Dombrova Gurnica, Poland).

There are agreements between the mentioned universities and NULES of Ukraine according to exchange of scientific pedagogical and pedagogical staff and students.

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### Main International Projects (Programs)

ERASMUS+ - is the European Union Programme for 2014-2020 to support projects, partnerships, events and mobility in the areas of education, training, youth and sport (signed 16 agreements);

Project QANTUS -"Qualifications measures in the field of natural sciences in Ukrainian universities";

Project "System of differentiated forest management in forest ecosystems in the Ukrainian Carpathians, Czech Republic – Ukraine";

Innovative research project "Decreasing risks of catastrophic fires in the exclusion zone";

Regional Project of technical cooperation MAGATE "Radiological Support for the Rehabilitation of the Areas Affected by the Chernobyl Nuclear Power Plant Accident";

Project for the development of grain warehouses and agricultural cooperatives of Ukraine, SOCODEVI;

"Use of natural waterpots to extinguish forest fires with apply of new technologies";

COMET "Coordination and implementation of Pan-European instrument for Radioecology", project of the European Commission FP7;

"Ecological law", "Food safety control in the EU", project "Erasmus +", Jean Monet direction;

"Biofuel production from new biomass sources";

Program of academic exchanges MELVANA.

Every year in NULES of Ukraine:

- **about 200 students** train and do internship at overseas universities;
- **about 500 students** have practical training at the leading agricultural enterprises in different countries;

- **more 200 lecturers** do internship in foreign institutions train, establish cooperation and represent the university in international events.

### 1.14. Student self-governing

There is a Student Organization at National University of Life and Environmental Sciences of Ukraine which is actively developing. Its activities focus on the organization and consolidation of the students, protection of rights and legitimate interests of students, developing leadership skills, creative abilities by organizing their leisure through the activities of the clubs.

Clubs and cultural centers of SO:

- Club of Experts;
- Club "City Of Mafia";
- Science club;
- Media-centre;
- Center of social work;
- Sports Center;
- Tourist club "Bars".

SO collaborates with many organizations and agencies. Students are members of Student Council under the auspices of the head of Holiivskyi district of Kyiv city administration, the Student Council of Kiev, the Joint Council of the Ministry of agrarian policy and food of Ukraine. Collaboration with the student councils of other universities makes it possible to find new perspectives, to carry out joint activities and to implement projects.

### **1.15. Areas of graduates' employment**

According to state regulatory documents of Ukraine graduates of higher educational institutions of environmental, biological, technical, agricultural areas, who have received a degree of **bachelor**, are provided with areas of employment, depending on the field of study (specialty) for positions of technicians, engineers, foresters, forestry engineers, economists, accountants, agronomists, doctors of veterinary medicine, specialists, etc. in industries of agriculture, forestry and fisheries, veterinary services, processing industry, energy, technical services, engineering; public administration, commerce.

Employment of graduates of the National University of life and environmental Sciences of Ukraine is carried out in the agricultural enterprises of different forms of ownership, fisheries, meat and fish processing enterprises, state agricultural and land inspection agencies, environmental companies, the central executive authorities in the sectors of agriculture and land resources and their territorial subdivisions, the state quarantine service, state reserves, nature reserves, regional and district agricultural agencies, state veterinary medicine institution, private clinics of veterinary medicine, state forestry, forest hunting and hunting enterprises, zoological parks, institutions of natural reserve fund, public and commercial woodworking and furniture enterprises, public housing companies, trusts engaged in landscaping of green spaces, private firms on gardening and landscape design, landscape design offices, joint ventures and subsidiaries of international firms etc.

Graduates of NULES of Ukraine can also continue their education in the basic institution of the University (Kyiv) and SS of NULES of Ukraine "Berezhany agrotechnical institute" in the specialties and specializations of master's programs given in table 1.2 in the part "Specialties for Bachelor's degree" of this Catalog.

## **2. Bachelor's Degree Programs**

### **2.1. General Regulations**

### **2.2. Agrobiology Faculty**

201 Agronomy

203 Horticulture and Viticulture

### **2.3. Faculty of Plant Protection, Biotechnology and Ecology**

202 Plant Protection and Plant Quarantine

162 Biotechnology and Bioengineering

101 Ecology

### **2.4. Faculty Livestock Science and Water Bioresources**

207 Water Bioresources and Aquaculture

204 Technology of production and processing of livestock products

### **2.5. Education and Research Institute of Forestry and Garden-Park Management**

205 Forestry Management

206 Park and Gardening Management

187 Woodworking and Furniture Technologies

### **2.6. Faculty of Veterinary Medicine**

211 Veterinary Medicine

### **2.7. Faculty of Alimentary Technologies and Managing of Quality of Productes of Agricultural Sector of Economy**

181 Food Technologies

### **2.8. Faculty of Mekhaniks-Technology**

208 Agricultural Engineering

211 Transport Technologies (Road Transport)

### **2.9. Faculty of Construction and Design**

133 Sectoral engineering

192 Construction and Civil Engineering

### **2.10. Education and Research Institute of Energetics, Automatics and Energy Saving**

141 Power Engineering, Electrical Engineering and Electrical Mechanics

144 Heat power engineering

151 Automation and Computer Integrated Technologies

### **2.11. Faculty of Land Management**

193 Geodesy and Land Management

**2.12. Law Faculty**

081 Law

**2.13. Economic Faculty**

051 Economy

072 Finance, Banking and Insurance

071 Accounting and Taxation

076 Entrepreneurship, Trade and Exchange Activities

**2.14. Faculty of Agrarian Management**

075 Marketing

073 Management

**2.15. Faculty of Information Technology**

051 Economy (Educational program «Economic Cybernetics»)

051 Economy (Educational program "Digital Economy")

122 Computer Science

121 Software Engineering

123 Computer Engineering

125 Cybersecret

**2.16. Humanitarian Pedagogical Faculty**

231 Social Work

035 Philology

291 International relations, social communications and regional studios

015 Professional Education

053 Psychology

061 Journalism

**2.17. Education and Research Institute of Continuing Education**

241 Hotel-restaurant business

242 Tourism

## 2.1. General Regulations

The components of Educational-professional Programs (EPP) in the bachelors training curricula are structured into the following constituents:

1. GENERAL TRAINING CYCLE

2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

In each cycle components of EPP are divided into Compulsory and Optional.

Compulsory components - 60% of the total student workload (their list, the amount and forms of attestation are determined by the standards of higher education, requirements of MES of Ukraine within the relevant field of study (specialty) and included into the curriculum of specialists training in full).

Optional Block components (University Choice) - 15% of the total student workload (their list, forms of study (in-class or self-study) and attestation is defined by the academic council of the University).

Optional Block components (Student's Choice) - 25% of the total student workload (their list, forms of study (in-class or self-study) and attestation is defined by working groups formed by order of the Rector of the University, recommended by academic councils of the faculties (ESI), adopted by educational and methodological University Council and approved by the Academic Council of the University. They are included into the curricula of specialists training according to the student's choice).

The curricula determine the total amount of time for study of each discipline in credits of European credit transfer accumulating system – ECTS (one credit ECTS – 30 hours) and The final control (Exam or Test).

Within one specialty the curricula of Bachelor training for the first three terms (1,5 year of study) are common. Beginning with the fourth term (2-nd year of study) they differ by the elective components according to the future Master's specialty that allows graduate's of Bachelor programs to adjust to the changes on the labor market.

According to the order of rector of university from 26.02.2018 № 171 «About development of workings curricula on 2018-2019 academic year», the elective disciplines offered by the University are the following: **«History of Ukrainian Statehood», «Ethnocultural», «Philosophy», «Ukrainian language for professional purposes», «Foreign language», «Physical education», «Safety of labor and vital activity» «Legal culture of a personality, «Crop production technologies», «Animal husbandry technologies», «Information technology (in branch)», «Starting your own business based on business design», «Business protocol and communication ethics».**

The volume of each selective discipline – not less than four credits ECTS. In the bachelors training curricula among 13 elective disciplines offered by the University the necessary for a particular specialty within 36 credits ECTS the boundaries are selected.

The annotations of the elective disciplines offered by the University are given below.

## Annotations of elective disciplines offered by the University

**History of Ukrainian Statehood.** The content of the educational discipline "History of Ukrainian Statehood" is the study of basic stages of formation and development of statehood on the Ukrainian lands, distinctive state building way of the Ukrainian nation. Building of the independent state needs highly skilled, patriotically inclined, socially oriented professionals able to continue the best traditions of the Ukrainians. The response to these circumstances is the study of this discipline in universities. It will allow to master the theoretical course, creatively apply their knowledge in practice and comprehend their own laws of the state building process, orientate in political life and feel their involvement in the state-thousand-year tradition of the Ukrainian people.

**Ethnocultural.** Content «Ethnocultural» due course need comprehensive development of strategic directions of Ukrainian statehood, achieve, the role and place of Ukrainian culture in the context of foreign culture. In the discipline given meaningful information about the origin of Ukrainian, their spiritual culture, economy, life, family. The realization of economic, social and political reforms require an appropriate level of human and national culture. Only through the mind of the individual, because of its high ethical and patriotic feelings may be real change in Ukrainian society.

**Philosophy.** The course introduces the system of knowledge in such fields of philosophy as ontology, gnoseology (theory of cognition), social philosophy, historical types of philosophy that explain the essence of relation "a human-being – the world" in its most important manifestations. The course is characterized by world outlook orientation which allows to synthesize obtained knowledge of special and humanitarian disciplines in integral conception of the world – theoretical basis of university level of specialists training.

**Ukrainian language for professional purposes.** The objective of the discipline is the improvement of the level of general language training, communicative competencies of students, practical mastering in the principles of stylistics of Ukrainian language that will provide professional communication at proper language level. The discipline is aimed at generalization and systematization of the knowledge in Ukrainian language, to form abilities and skills for optimal language behavior in professional sphere.

**Foreign language (English, German, French, Spanish).** The course develops communicative competency in students, especially the use of skills, abilities and knowledge of foreign language during business communications with the representatives from other countries specialized in various issues concerned business and labor market in agriculture, preparation to the participation in international conferences, projects and discussions as well as making presentations, business correspondence (formal and informal letters, c.v., various kinds of research articles and reports), in such way contributing into versatile development of student's personality and his/her socialization in a society speaking another language.

**Physical education.** The aim of the discipline is formation of physical culture of junior specialist and the ability to realize it in social and professional training and in family life. The objectives of the discipline are to improve students' health and develop physical abilities in accordance with the professional activity of a future specialist.

**Safety of labor and vital activity.** The aim of study of the discipline that combines such disciplines as «The fundamentals of labor protection» and «Safety of vital activity» is to obtain skills and knowledge for realization of effective professional activity providing optimal control of labor protection at enterprises, to form in students responsibility for personal and collective safety considering risk of anthropogenic emergencies, nature disasters and industrial accidents.

**Legal culture of a personality.** One of the features of a legal state is the high level of legal culture of the citizens characterized by the common respect to the law, sufficient awareness of its norms and the ability to apply them in all life situations. The discipline «Legal culture of a personality» will permit students to develop legal thinking and cultural style of legitimate behavior in everyday life in interpersonal relations as well as in communication with representatives of court and law enforcing authorities.

**Crop production technologies.** Academic discipline "Crop production technologies" involves gaining knowledge about the technically perfect and economically profitable growing of high yields of the best quality agricultural crops. It includes the study of the theoretical basis of modern technologies for the cultivation of crops, technical, energetic, medical plants; the development of technological maps and understanding of the requirements for conducting technological operations for the cultivation of the field crops. It supposes mastering the methods of the state of crops diagnostics in the field through the methods of forecasting and programming of the yields, risks assessment of field crops cultivating as a control system of the production, sale and use of standardized quality of crop production.

**Animal husbandry technologies.** The aim of the discipline is to form students' strong knowledge, skills and abilities of scientifically based technologies of production of livestock products using innovative technologies. The task of the discipline is to provide future specialists with a set of knowledge on the organization of feeding, breeding and reproduction, the keeping of farm animals and the production of products from them.

After studying the discipline, the student has to know: a system of theoretical knowledge related to the production of eco-friendly livestock products, in accordance with legislative acts, standards, standard management decisions, goals of the enterprise. Students should be able to: manage the technological processes of production of livestock products in different economic systems in order to obtain maximum productivity.

**Information Technology (in branch).** A digital citizen is a modern requirement. Information and data: forms of the presentation and means of processing. Information processes. System maintenance of information processes, software tools for working with structured documents, network technologies, application of the Internet resources and services in the branch. Special software (support of business processes of the chosen branch). Fundamentals of web design, organization of computer security and information security, software tools for working with databases and data warehouses, prospects of the development of information technology. Modern digital communications in the global space. Monitoring and evaluation of digital competencies. Building a self-educating trajectory of a future specialist (non-formal learning). Professional certification in accordance with the professional development of the Microsoft Office Specialist.

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**Setting up your own business based on business design.** The aim of the discipline is the formation of knowledge and practical skills to set up own business on the basis of business design. The task of the discipline is to study the theoretical foundations and normative and legal support for setting up own business. The content of the discipline is in the following topics: entrepreneurial activity and its types, administrative and legal forms of entrepreneurship, the mechanism of setting up own business, business planning of entrepreneurial activity, drawing up of investment projects, economic evaluation of technologies, financial and credit support of entrepreneurship and taxing, accounting and reporting in business structures, economic efficiency of business entities.

**Business protocol and communication ethics.** The protocol is called the form of a hierarchical order, demonstrating good manners of the partners from different countries. It is a set of conduct rules, norms and traditions at formal and informal meetings. Even in the ancient times, it was said that the protocol was a sign of friendship. The protocol defines methods, frames, behavior and etiquette.

Etiquette is the game rules called "life". These rules are equal for all, regardless of the age, gender, status. As they dictate not what to do, but how to do it. Communication plays an important role in our life, and its psychological nature is too complicated. In the process of communication, the desired organization and unity of actions of individuals are achieved, intellectual and emotional-sensory interaction is realized among them, a common sense of attitudes and opinions are formed, mutual understanding and coherence of action, cooperation and solidarity are achieved, so team work is impossible without that.



## 2.2. AGROBIOLOGY FACULTY

**Dean – Oksana Tonha**, Doctor of Agricultural Sciences, Associate professor  
 tel.: (044) 527-82-13, E-mail: oksana16095@gmail.com  
 Location: Building № 4, room 41<sup>a</sup>

The Faculty organizes and coordinates the educational process of bachelors in specialties:

### **201 Agronomy**

Educational-professional Program «**Agronomy**»

Graduating departments:

Plant Growing Tel.: (044) 527-86-26 E-mail: dep.plant@gmail.com  
 Head of department – Doctor of Agricultural Sciences, Professor, S. M. Kalenska

Agriculture and Herbology Tel.:(044)527-82-14

E-mail: zemlerob1@ukr.net

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

Technologies of Storage, Processing and Standardization of Plant Production named after Professor B. V. Lesyk Tel.: (044) 527-86-66

E-mail: 1968storage@gmail.com

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

Forage production, Melioration and meteorology Tel.:(044)527-85-15

E-mail: kafedra-kormovirobnitstvo@ukr.net

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

Genetics, breeding and seed them. prof. M.O.Zelenskoho Tel.: (044) 527-86-26

E-mail: breedingdepartment@gmail.com

Head of department – Candidate of Agricultural Sciences, Associate professor O. S. Makarchuk

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

Tel.: (044) 527-88-17 E-mail: quality\_chair@mail.ru

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

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

Tel.: (044) 527-81-02 E-mail: grunt\_nubip@ukr.net

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

**203 Horticulture and Viticulture**

Educational-professional Program «**Horticulture and Viticulture**»

Graduating departments:

Vegetable Growing and Soil under Cover

Tel.: (044) 527-81-69 E-mail: ovochi.z@i.ua

Head of department – Candidate of Agricultural Sciences, Associate professor I.O. Fedosiy

Gardening named after Professor V. L. Symyrenko

Tel.: (044) 527-85-59 E-mail: hortdep@gmail.com

Head of department – Candidate of Agricultural Sciences, Associate professor Y. Y.Andrusyk

**Bachelor  
in specialty "AGRONOMY"  
field of knowledge "Agricultural science and food"**

Form of Training:	Licensed number of persons:
– Full-time	220
– Part-time	90
training period	4 years
Credits	240 ECTS
Language of training	English, Ukrainian
Qualification of graduates	Technologist of Agronomy

**Concept of training**

Education Of bachelors from direction is aimed at training professionals able to use adaptive technology for growing and logistics crops, to ensure their economic, energy, economic and environmental efficiency, seed organizing work, agrochemical conduct and maintenance of modern technological processes in the plant, take measures of rational use and restoration of soil fertility.

**Practical training**

Students receive practical training in educational research farms of NUBiP Ukraine: NUBiP Ukraine "Agronomic Research Station," "Velykosnitynske educational and research farm named after O.V. Muzychenko," and as well as leading agricultural enterprises of different ownership.

**Proposed Topics for Bachelor theses**

- 1.State industrial and business and technology of growing crops in the particular sector.
2. Ahroekonomichnyy analysis of agriculture and technology of cultivation of field crops on the farm.
3. Technological and product quality crops, depending from factors cultivation, post harvest handling and storage.
4. Ahroekonomichnyy analysis of the feed and cultivation technology of forage crops in the economy.
5. Technology of production of high-quality seeds and the results of the investigation of varieties and hybrids under condition specific farm.
6. Optimize Power and fertilize crops.
7. Power Diagnostics crops and crop quality management.
8. Impact of resource saving, soil cultivation technologies on soil properties.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

Place of employment of bachelors include: agricultural enterprises of different ownership, public health centers of quality of soil fertility and of crop production; Ukrainian State pomology inspection, Ukrainian State Seed Inspection, the State Committee for Land Resources, with its vertical in regions and districts, elevator company, state security service soil.

**Bachelor`s Program and Curriculum  
in Specialty «Agronomy»  
Educational-professional program «Agronomy»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Botany	6	exam
CC 2	Agrophysics	4	exam
CC 3	Chemistry	10	exam
	(incl. inorganic and analytical organic, physical and colloidal)	6	exam
		4	exam
CC 4	Agroecology basics of radiobiology	4	exam
CC 5	Genetics	4	exam
CC 6	Plant physiology with the fundamentals of biochemistry	4	exam
CC 7	Agrometeorology	4	exam
CC 8	Stockbreeding and beekeeping	4	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian Statehood	4	exam
OB 1.2	Philosophy	4	exam
OB 1.3	Physical training	4	test
OB 1.4	Ethnocultural	4	exam
<b>The volume of components of the general training cycle</b>		<b>66</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 9	Soil Science with the bases of geology	7	exam
CC 10	Agricultural Entomology	5	exam
CC 11	Phytopathology the basics of virology	5	exam
CC 12	Farm equipment of agricultural production	6	exam
CC 13	Basic research in agronomy	4	test
CC 14	Agriculture	9	exam
CC 15	Herbology	4	exam
CC 16	Plant Growing	11	exam
CC 17	Field and meadow fodder	5	exam
CC 18	Agrochemical chemistry	8	exam
CC 19	Fruit-growing	8	exam
CC 20	Vegetable growing	5	exam
CC 21	Breeding and seed growing of crops	8	exam
CC 22	Technology of storage and processing of plant products	7	exam
CC 23	Standardization and management of planting products quality		exam
CC 24	Agricultural economics and business	5	exam
CC 25	Technologies of Protected Cultivated	5	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.5	Ukrainian for professional purposes	4	exam
OB 1.6	Foreign language (English, German, French, Spanish)	4	exam
OB 1.7	Safety of work and life	4	test
OB 1.8	Legal culture of personality	4	test
OB 1.9	Information Technology	4	exam
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1 «Agronomy »</b>			
OB 2.1.1	Agricultural microbiology	6	exam
OB 2.1.2	Fundamentals of land management and land cadastre	4	test
OB 2.1.3	Land reclamation	6	test

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.1.4	Fundamentals of agribusiness and management	6	test
OB 2.1.5	Biotechnology	4	test
OB 2.1.6	Programming and forecasting crop yields	4	test
OB 2.1.7	Seed Studies	5	exam
OB 2.1.8	Technological examination of crop production	6	exam
OB 2.1.9	The management of the functional value of the crop products	5	exam
OB 2.1.10	Mathematical and statistical methods of analysis in agronomy	5	exam
OB 2.1.11	Seasonal phytocenoses	4	test
OB 2.1.12	Breeding and Seed-growing heterosis hybrids	5	exam
<b>Optional Block 2.2 «Agrochemistry and Soil Science»</b>			
OB 2.2.1	Agricultural microbiology	6	exam
OB 2.2.2	Fundamentals of land management and land cadastre	4	test
OB 2.2.3	Land reclamation	6	test
OB 2.2.4	Fundamentals of agribusiness and management	6	test
OB 2.2.5	Biotechnology	4	test
OB 2.2.6	System of the fertilizers application with the basic of the differential fertilizers application	10	exam
OB 2.2.7	The methodology of the agrochemical investigation with basic of the remote field monitoring	6	exam
OB 2.2.8	The management of the quality of crop products	5	exam
OB 2.2.9	Technology of rational land use	4	test
OB 2.2.10	Soil mapping	5	exam
OB 2.2.11	Soil conservation	4	test
<b>The volume of components of the special (professional) training cycle</b>		...	
<b>Optional Block 2.3 «Selection and Genetics of Agricultural Crops»</b>			
OB 2.3.1	Agricultural microbiology	6	exam
OB 2.3.2	Fundamentals of land management and land cadastre	4	test
OB 2.3.3	Land reclamation	6	test
OB 2.3.4	Fundamentals of agribusiness and management	6	test
OB 2.3.5	Biotechnology	4	test
OB 2.2.6	Special genetic field crops	12	exam
OB 2.2.7	Special breeding and variety studding crops	11	exam
OB 2.2.8	Seed-growing of the field crops	11	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>184</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 26	Military training course	29	
CC 27	Academic Practice	23	
CC 28	Production Practice	5	
CC 29	Bachelor Thesis writing (Graduate thesis or Project)	4	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Botany.** The aim of the course is learning patterns of plants and vegetation as an essential component of bioenergy biosphere. As a result, the study of botany student has to learn self-study method with a microscope, the self-production of medicines and analysis of the cellular and tissue level and at the level of individual organs and the whole organism, which is of great cognitive and practical importance. Therefore, the importance given to the organization and conduct summer field practical training during which students independently collect and plants, conduct research geobotanical certain types of vegetation, which is the final stage of study and analysis of the current state of vegetation, studied ways to improve forecasting of natural plant communities. The aim of the course is also a botany student mastery of botanical knowledge, botanical terminology necessary for conscious and competent study of other related disciplines that form the professional agricultural training profile.

**Argophysic.** The course is studied the physical, physico-chemical and biophysical processes in the system "soil-plant-active layer of the atmosphere," the basic laws process developed scientific basis, methods, means and ahrozahody rational use of natural resources. During the study abiotic factors of productivity of plants, such as moisture, heat, air, food, soil located in the column and describe their effects on plant growth and development, apply classical laws of physics. Argophysic explores the physical processes in the soil, plants and atmosphere, develop physical models, schema specifies relationships between the main components.

**Chemistry.** The program includes theoretical principles of modern inorganic chemistry and peculiarities of chemistry of biogenic elements such as Hydrogen, Halogens, Oxygen, Sulfur, Nitrogen, Fluorine, Carbon, metals. The chemical processes involving these elements and their compounds are considered from the standpoint of electrolytic dissociation, hydrolysis, redox processes and possibility of forming complex compounds. The basic classes of inorganic compounds: oxides, hydroxides, acids, salts are discussed. The analytical module includes the basics of qualitative and quantitative chemical analysis. Discusses quantitative methods of gravimetry, acid-base titration, redoxometry, complexometry. During the study of physical and colloid chemistry deals with the issues of thermodynamics, thermochemistry, theory of solutions, chemical kinetics and catalysis, the main provisions related to highly dispersed state of matter, surface phenomena and adsorption. The nomenclature, being in nature, the role in the living organism, structure, laboratory and industrial methods of obtaining, chemical properties of the main classes of organic compounds: alkanes, alkenes, alkadienes, alkynes, cycloalkanes, aromatic compounds, terpenes, and halogen derivatives, alcohols, phenols, aldehydes and ketones, carboxylic acids and their esters, anhydrides and halogenate, amines and amides, carbohydrates, amino acids and proteins, nucleic acids are studied in the course of organic chemistry.

**Agroecology basics of radiobiology.** Actuality of its study consists in that in the process of studies students meet with basic problems which exists in agrosphere. The main aspects are studying belongs acquaintance with the harmful action of pesticides, contamination of environment, as result of mineral fertilizers application, and agricultural produce - by nitrates. The special attention is devoted the degradation processes of soils: humus damages, wind and water erosion, undepressed. Questions are also consider in relation to the alternative ways of support of agriculture, bringing of organic; fertilizers and

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biological protection of plants, soil protection cultivation till and general ecological situation, in agro landscapes. The course considers the principles of agricultural radiobiology and radioecology; it introduces into the problems of biological impacts of ionizing irradiation, the radionuclide migration in the Environment and in the agricultural objects, the basic concepts of the radio ecological and dissymmetric monitoring; it presents the structure of the radiation control system, the methods of assessment and normalization of the doses and permissible levels of the radioactive contamination in accordance with the norms of radiation safety of Ukraine; it analyzes in details the countermeasures for reduction of the radio nuclides transfer into agricultural production and foodstuffs, as well as the ways for the ionizing irradiation application in the agricultural practice.

**Genetics.** Discipline envisages the acquaintance of students with the basic divisions of genetics modern knowledge. Includes next divisions: bases of molecular genetics, structure and functions of proteins, nucleic acids and chromosomes, mechanisms of expression of genetic information, structure of genome, cytogenetic aspects of inheritance of genes, changeability, her reasons and consequences, features of reproduction of plant organisms, basis of population genetics, some problems of the applied genetics. Discipline envisages listening of course of lectures, conducting of practical employments and solutioning of tasks from all basic subdivisions from molecular biology to the population genetic.

**Plant physiology with the fundamentals of biochemistry.** Discipline is one of the basic disciplines in the training of specialists in "Agronomy". Discipline involves studying the functions of plant organism and the laws of its life. The role of the discipline is to provide future specialist deep and comprehensive knowledge of the biology of the plant cell, water regime of plant organism, mechanisms of respiration and photosynthesis, mineral nutrition, plant growth and development, adaptation and mechanisms of resistance to adverse environmental factors. Acquired knowledge of plant physiology will allow future specialists in the area of agriculture practice to implement the latest achievements of science, have scientific and professional approach to technologies in crop growing and to independently develop and adjust agronomic activities by understanding the physiological processes of plant organism. The study of the chemical composition, structure, transformation of substances and energy that occur in plants. Patterns of occurrence and the relationship between the various metabolic pathways principles of regulation in plant cells. Establishing patterns of metabolism major classes of organic compounds - carbohydrates, proteins, fats, vitamins, etc., to create conditions for crops that provide the largest amount of receiving substance.

**Agrometeorology.** The discipline program provides for studying of agrometeorological factors influence the performance of agricultural production. The discipline focuses on the modern methods for assessing climate from the standpoint of agricultural production and agro-climatic zoning. The course demonstrates the hazardous weather activity for agriculture and proposes the measures to combat them. The course of discipline provides examples of agro-climatic justification agrotechnical and reclamation activities. The modern and advanced methods of agrometeorological observation and agrometeorological forecasts are considered in the course. In addition, students will understand and analyze the importance agrometeorological ensure of agricultural production.

**Stockbreeding and beekeeping.** The program stipulates studying a condition of the basic ways of development of animal industries at the present stage in Ukraine and the advanced countries of the world, biological bases of cultivation and feeding of agricultural animals, and also "know-how" production animal industries in conditions of an intensification of an agricultural production in economy of different patterns of ownership, finding of habits of an estimation of the ex-terrier, the constitution of animal different kinds of productivity, and also definition of norms of feeding and drawing up of diets for separate

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kinds of agricultural animals. Study module "Beekeeping" required to get the students knowledge on plants honey and pollination of crops by bees. Expected learning products plants collected bees for their power and provide a marketable product. Served as melliferous plants characteristic of plants, their classification, use to create tricks in different periods of the season. Reveals the role of bees as pollinators of plants, equipment and organization pollination of various crops, effectiveness in increasing yields of fruit and seeds.

### Optional components

#### *Optional Block 1 (University Choice)*

Annotations of disciplines "History of Ukrainian Statehood", "Ethnocultural", "Philosophy", "Physical Training" see Section 2.1.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Soil Science with the bases of geology.** Soil science is science, which studies genesis, development, structure, composition, properties and laws of geographical distribution of soils, ways of their rational use and restoration of fertility. Knowledge of theoretical bases of soil science enables to understand and grasp problems and prospects of land use. Purpose of the course "Soil Science with the Bases of Geology" is deep cognition and study of the soil cover as environment of agricultural crops growing, and also place of existence of living organisms, study of structure and basic properties of soils, their mineralogical composition, laws of geographical distribution of soils, cognition of natural processes of soil.

**Agricultural Entomology.** The course deals with Introduction to entomology and insect-pest management, including morphology, life processes, ecology and biology of key agricultural pests. Students are provided with knowledge of tactics of population suppression, and ecological backlash and level of entomophagous efficacy.

**Phytopathology the basics of virology.** Plant pathology studies phytopathology, reasons of their appearance features in development, symptomatology pathologies, species composition, morphology and bioecology of agents plant against pathogens, methods and systems of immunity, protection. On the basis of knowledges of phytopathology methods should be able determine of symptoms disease to carry out identify of pathogens and diagnose of diseases. On explicit data its need to conduct phytopathology monitoring as a results which it is differentiated to realize the prophylactic and therapeutic measures of control plant disease. Main purpose of study course is acquisition a theoretical foundations and formation of practical skills of students who will investigate plant viruses and methods of struggle of viral spread. The practical part of course includes study modern methods which can be used by a work with plant viruses, especially for viral diagnostic and identification by means of biological testing, electron microscopy and immunoassay methods also for getting a unviral landing material by microclone method of reproduction. Knowledge of above methods is necessary for training of high educational specialists in agriculture.

**Farm equipment of agricultural production.** The general issue of mechanization processes in crop, destination, general structure and workflow of machines for growing and harvesting crops and general issues mashynovykorystannya in crop. Study ways of regulating the working process and setting up machines and methods to control



performance of the machines in a production environment. Consolidation of theoretical knowledge occurs during training practice.

**Basics of scientific research in agronomy.** Lectures on discipline covers the theoretical foundations of research and their application in practice, planning and research in agronomy, application of statistical methods in agronomic research and a plan of research using application software. Laboratory - practical course dedicated to the study of methods and algorithms statistical analysis of experimental data, variation, variance, correlation, regression, Pearson analysis, probit analysis.

**Agriculture.** Following the completion of this course the student should know the task agriculture as an industry, discipline and science; possess the scientific principles and laws of agriculture. Know the factors of life of plants and field methods to be able to introduce regulation in agriculture. The student must know the basic soil types and rates of fertility regulation and ways of reproduction of soil fertility; the scientific basis of crop rotation, principles of design, development patterns and development acreage field crop rotations. To know the scientific basis of measures, methods and systems of cultivation; agronomic requirements for sowing crops i care measures for crops; types of soil erosion and deflation i measures to prevent them; features of farming in contaminated areas. Master the scientific principles of farming systems and their features in different soil and climatic zones; the features of the system of industrial, environmental, organic (biological) systems and erosion control farming no-till, mini-till.

**Herbology.** Discipline is one of the basic professional training in agronomy. In the lecture course covers the scientific foundations of Herbology, description and place segetal plants in modern agrophytocenoses and its negative impact on crops. The course is finalized to the development of measures and systems for the control of weeds in modern farming systems. Laboratory course devoted to the study of weeds and the acquisition of practical skills of development of systems of weed control in agricultural crops.

**Plant growing.** The course forms future specialists with knowledge and skills of technological measures for maximizing the biological potential of yield cultivated crops; Includes studying of the trends in development of plant growing industry in Ukraine, commercial value, diversity of use, distribution and yield potential of crops and samples of their implementation in production; environmental and biological and agrochemical bases of crop; advanced cultivation technologies for getting high environmentally friendly yields of crops in different soil and climatic conditions of Ukraine; requirements of state standards for the quality of crop production and ways of it improving; measures for reducing to a minimum losing of crop during harvesting, transportation.

**Field and meadow fodder.** The discipline program provides for studying of scientific-grounded system of organization-managemental, biological, technological and economical measures of production, conservation and storage of fodder. The course provides for studying of the system of organization measures and technological methods, aimed to increase natural forage land productivity, creation of sowed hayfields and pastures, and efficient use of them.

**Agrochemical chemistry (agrochemistry).** The goal of the studding of the theoretical materials and laboratory classes are mastering for bachelor of the agronomy in theoretical knowledge and practical skills into basic of plant nutrition, their chemical composition and nutrients take up, soil properties in interaction with plant nutrition and fertilizers application, fertilizers classifications, fertilizers types and kinds, fertilizers production, fertilizers using and fertilizers influence on environment. And, this discipline helps formation practical skills in determination of the level of the crop nutrients supply, levels of the nutrients supply of the soils, identify of the fertilizers kinds and fertilizers forms, their interaction with soils, determination of the soil need in soil melioration.

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**Fruit growing.** The program provides study of fruit, berry plants and grapes - their value, morphological and biological characteristics, methods of propagation, rootstocks, the structure of fruit nurseries and technology of growing seedlings, lay the fruit trees, systems maintenance and cultivation in gardens, fertilization and irrigation plantation, forming and trimming of fruit trees, care for the harvest and other work in gardens, preparing and harvesting technology, biological features and technology of growing small crops and grapes.

**Vegetable growing.** This lecture course covers the issues of biological foundations of vegetables, the features of the preparation and fertilization of soil, plant propagation, the seedlings' planting into the open ground, the common measures for plants' caring, the harvest and cultivation technology of the main vegetables such as: white-head cabbage, red-head cabbage, cauliflower, tomato, pepper, eggplant, cucumber, zucchini, squash, carrots, beet, onion, lettuce, spinach, fennel, rhubarb, sorrel. The morphological characteristics of vegetable crops and their classification are studying in the laboratory practical classes. The ways of propagation, the calculations in seedlings' needs of different vegetable crops are also considered. The methods of control and the regulation of temperature, lighting regime, carbon dioxide, humidity and nutrient regime are in this theme. The estimation in seeds' needs of various vegetables, the scheme of sowing and feeding area are considered.

**Breeding and seed growing of crops.** Discipline envisages an acquaintance and fixing of knowledge from: tasks to the breeding and seed-grower in modern terms; theoretical principles and methods of breeding; essences of plant-breeding process; State qualifying examination; studying of basic quality signs, variety and hybrids of basic cultures that is brought to the State register varieties of plants of Ukraine; organization and technology of conduct of primary and certificated seed-growing; concepts about ecology of seed and ecological seed-grower; State and farming variety and seminal control of sowing and quality of seed; documentation quality sowing and seminal material; adaptation of home seed-grower to the international scheme and procedures; relations between breeders, producers and consumers of seminal products. Discipline envisages listening of course of lectures, implementation of practical and departure studing.

**Technology of storage and processing of plant products.** The course examines on the final course for the "Bachelor" when students have already learned agricultural techniques of production cereals, legumes, groats, oil, technical, vegetable and fruit plants. The program includes technology of post-harvest handling, storage and primary processing grains, cereals, legumes for the different purpose, fruits, vegetables, potatoes and industrial crops (sugar beet, flax, hops, essential oil plants). The program of discipline provides study keeping capacity (the ability to be stored) harvest yield and its ability to provide certain processed products obtained under favorable growing conditions and unfavorable conditions and how affecting factors of securities, agrochemical on the quality of fresh or processed products. The program of discipline included the basics of drying, cooling, chemical preservation and storage of grain and other products. The keeping capacity of potatoes and vegetables depend on the factors of cultivation, post-harvest handling must learn. Theoretical foundations of long-term storage, the foundations of primary processing of plant products must be learn. Students must learn the requirements of the standards and methods of quality evaluation crop production.

**Standardization and management of planting products quality.** The course includes the study of the following issues: the goals and objectives of standardization, standardization essence of the science, teaching the basics of standardization, product quality issues, standardization of quality products and the methods of control, international standards. General information on national and international experience in quality management, certification and metrology software. The development of the current requirements for plant products intended for the purpose of producing competitive

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products. The development of effective measures of quality control in the production of high-quality, environmentally friendly, organic and competitive products. The development of principles and procedures for certification of products for the domestic market and export. Features creation and implementation in production systems ISO 9000 with the following quality management system accreditation. While teaching discipline taken into account existing laws on standardization, certification and safety of plant products.

**Agricultural economics and business.** A course foresees the study economics of the system of agrarian relations of productions in intercommunication with development of productive forces of agriculture. Criteria and indexes, which characterize development of agricultural production, ways and methods of the rational use of earth, financial and labours resources, are herein examined. The necessity of development and improvement of resource potential of agriculture opens up, the method of determination of economic efficiency of agricultural industries is given. The terms of forming of prime price and profitability of products of agriculture, development and functioning of market of food light up. The problems of intensive development of industries of agriculture are studied on the basis of the wide use of industrial technologies, rational placing and specialization of agricultural production on the base of agro industrial integration in the conditions of relations of markets.

**Technologies of Protected Cultivated.** The program of discipline's are subscribes for the gist of the greenhouses vegetable, mushroom's and flower growing. Describes the biological capacities of the objects growing for the terms of Protected Cultivated, technological methods for the growing of the vegetable, flower crops and mushrooms. In the course is devoted to the greenhouse's constructions for the crops and it's using. The gist of growing the ecological production's are describes.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines "Ukrainian for Professional Purposes", "Foreign Language (English, German, French, Spanish)", "Labour and Life Safety", "Legal Personal Culture", "Information technology" see Section 2.1.

#### ***Optional Block 2 (Student's Choice)***

##### ***Optional Block 2.1 "Agronomy"***

**Agricultural microbiology.** The subject give knowledge about morphology, structure, classification, genetic, physiology and ecology of basis groups of microorganisms, their role in utilization of complex plant and animal remains, breaking them down into simpler chemical forms which are returned to the soil. The importance of microorganisms in human practice activity, microorganisms interaction between themselves and high plants, give knowledge about microbiological means of protection against deseases and pests of plant, perspective means of plant protection for graving harvest agricultural crops.

**Fundamentals of land management and land cadastre.** Efficient and effective use of land remain issues of concern in agricultural production. The basis of effective agricultural are the proper land use organization. And its basis is performed systematic, coherent organization of all elements of management. The course reveals the features of the state policy on formation of rational land ownership and land use, organizing areas of agricultural enterprises with the creation of spatial conditions that ensure the ecological

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and economic optimization of the use and protection of agricultural land, the introduction of advanced forms of management of land use, improving the value and location of the land, the system of crop rotation and hay-pasture rotation. It reveals a system of measures to preserve and improve the natural landscapes, restoration and improvement of soil fertility, protection from erosion.

**Land reclamation.** The discipline introduces students to the technological characteristics of applying hydroengineering, land clearance, chemical, agrotechnical and forest reclamations and forms students' competence in the technology of agricultural production on reclaimed lands. The discipline focuses on the development of new agricultural technology of irrigation (micro-, drip irrigation, etc.), which enables to increase significantly the yield of crops in terms of increasing climate aridity. The discipline ensures the students to obtain the basis of professional knowledge to improve soil productivity as well as preserve soil fertility in different climatic zones of Ukraine.

**Fundamentals of agribusiness and management.** The purpose of discipline - to give students a comprehensive system of knowledge of nature management in agricultural enterprises and organizations, the skills process control in farms; provided that the impact of economic structures; diagnosis and designing system of agricultural management, adequate goals and objectives of market economy in agriculture. Ability of future professionals to streamline the organizational structure and management system to form the company, to ensure the dynamic development and competitiveness.

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

**Programming and forecasting crop yields.** The aim is obtaining of high, stable and predictable yields of crops. The solution is possible if are the quantitative determination of the impact of natural, organizational and technological factors on growth, development and formation of plant productivity, establishing degree of ensuring agricultural cultures by these factors in a specific soil and climatic conditions and establishment of necessary resources for their regulation, what is the main task of programming the yields. Soil fertility and yields programming is aimed on organization of agrophytocenoses, as a system for getting maximum productivity of it. Providing the population by crop production will be carried out mainly by the growth of yields, by introduction of scientific and technological achievements in agriculture and plant growing. The set of measures to achieving of this goal incorporate programming course of soil fertility and yields of agricultural crops. It is based on the needing of the plants in essential resources.

**Seed Studies.** Discipline involves mastering the knowledge of the theoretical and practical principles of forming sowing, yield and varietal qualities. Includes studying of the theoretical foundations of formation, features of passing ontogenesis and organogenesis stages, anatomy, morphology and chemical composition of the seeds, physical and mechanical properties of the seeds and methods for removing seeds from dormancy, energy of germination, vigor of germination, vitality and longevity of seeds, breathing and injuring of seeds. After studying the discipline, student should to know modern cultivation technologies, harvesting, cleaning and storage of high-quality seeds of field crops, national and international legislative and regulatory framework for production, sale and using of seeds, methods for determining sowing qualities of seeds, control inside the farm and state control of seed producing in compliance with the rules at all stages, state inspection of seed studies of cereal crops as a system of producing control, implementation and using of cereal seeds.

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**Technological examination of crop production.** The discipline "Technological examination of crop production" focuses on the issues of determining the quality and safety of raw materials and finished products, the characteristics of the elements of cultivation, processing, storage and processing technologies, the use of which provides the highest quality and safety of food products. Also, the discipline involves establishing the conformity of plant raw materials and finished products with the requirements of normative documents or identifying errors in the technological process, which determine the mismatch of products, detect violations of raw materials and materials through the introduction of new technological equipment at the enterprise, the use of new types of raw materials, detecting deviations of the parameters of the technological process, affecting the quality and safety of products, the size of technological costs and losses, the output of the final product one or unaccounted for detecting possible counterfeit products and so on. Studying the discipline will allow students to conduct on a high professional level a technological examination of the production and processing of crop production, the assessment of the quality and safety of food products and food raw materials, to establish compliance with its requirements of the relevant standards, including international, in order to improve the quality and competitiveness of domestic products.

**The management of the functional value of the crop products.** The goal of the studying of the theoretical materials and laboratory classes are mastering for bachelor of the agronomy in theoretical knowledge and practical skills in basic of the protein metabolism, carbohydrates metabolism, lipids metabolism, vitamins complex formation, mineral complex formation into crops and their management during of the plant vegetation into modern crop production systems according to climatic conditions, weather conditions, soil fertility, sorts and hybrids features for improving of the functional value of crop products according to standards.

**Statistical analysis of agronomic research.** The purpose of the course to give theoretical and practical knowledge of the main methods of agronomic research, the ability of independent research and statistical evaluation of data for future agricultural specialists. The objects of study are variational data series of observations, soils. The subject of study are statistical criteria of quality research, information indicators of growth and development of plants, the environmental conditions. The program brings together two sections: mathematical statistics and analysis of variational series; application of statistical methods in agronomic research.

**Seasonal phytocenoses.** The discipline program familiarizes students with distribution and composition of grasslands and their soil, hydrological and weather conditions. The course identifies ways to improve natural pastures and their rational use. The discipline focuses on the of transformation (change) meadow vegetation ways depending on use and farming items. The course covers of discipline the transformation (change) of meadow formation ways depending on use and agricultural methods. The discipline offers scientific measures on ecologizing and biologization grassland ecosystems.

**Breeding and Seed-growing heterosis hybrids.** The contemporary concepts of heterosis and conformities of its displays, the types of hybrid and technology breeding process of their creation are reporting by course. The types initial material and methods of creating inbred lines, specificity rating its combining ability, selecting hybrids combinations different genetic structure and synthetic varieties are displaying. Discipline involves the assimilation of methods industrial production of hybrid seed field crops by fertile and sterile base.

**Optional Block 2.2 “Agrochemistry and Soil Science”**

**Agricultural microbiology.** The subject give knowledge about morphology, structure, classification, genetic, physiology and ecology of basis groups of microorganisms, their role in utilization of complex plant and animal remains, breaking them down into simpler chemical forms which are returned to the soil. The importance of microorganisms in human practice activity, microorganisms interaction between themselves and high plants, give knowledge about microbiological means of protection against diseases and pests of plant, perspective means of plant protection for graving harvest agricultural crops.

**Fundamentals of land management and land cadastre.** Efficient and effective use of land remain issues of concern in agricultural production. The basis of effective agricultural are the proper land use organization. And its basis is performed systematic, coherent organization of all elements of management. The course reveals the features of the state policy on formation of rational land ownership and land use, organizing areas of agricultural enterprises with the creation of spatial conditions that ensure the ecological and economic optimization of the use and protection of agricultural land, the introduction of advanced forms of management of land use, improving the value and location of the land, the system of crop rotation and hay-pasture rotation. It reveals a system of measures to preserve and improve the natural landscapes, restoration and improvement of soil fertility, protection from erosion.

**Land reclamation.** The discipline introduces students to the technological characteristics of applying hydroengineering, land clearance, chemical, agrotechnical and forest reclamations and forms students' competence in the technology of agricultural production on reclaimed lands. The discipline focuses on the development of new agricultural technology of irrigation (micro-, drip irrigation, etc.), which enables to increase significantly the yield of crops in terms of increasing climate aridity. The discipline ensures the students to obtain the basis of professional knowledge to improve soil productivity as well as preserve soil fertility in different climatic zones of Ukraine.

**Fundamentals of agribusiness and management.** The purpose of discipline - to give students a comprehensive system of knowledge of nature management in agricultural enterprises and organizations, the skills process control in farms; provided that the impact of economic structures; diagnosis and designing system of agricultural management, adequate goals and objectives of market economy in agriculture. Ability of future professionals to streamline the organizational structure and management system to form the company, to ensure the dynamic development and competitiveness.

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

**System of the fertilizers application with the basic of the differential fertilizers application.** The goal of the studding of the theoretical materials and laboratory classes are mastering for bachelor of the agrochemistry and soil science in theoretical knowledge in realizing of the modern systems of the fertilizers fertilization for crops based on determination of the balance and cycle of the nutrients in crop rotations, determination of biological features nutrition and fertilization for direct crops according to levels of the soil fertility and prognosticate crop yield for different crop production systems based on differential fertilization.

**The methodology of the agrochemical investigation with basic of the remote field monitoring.** The goal of the studding of the theoretical materials and laboratory classes are mastering for bachelor of the agrochemistry and soil science in theoretical knowledge into the remote field monitoring, planning, elaboration of the methods for agrochemical investigation, systematization, analyzing of the investigation results and giving of the recommendation for optimization of the fertilizers using such as effective factor for increasing of the crop productivity. The program of the discipline includes planning of the agrochemical investigation, methods and technologies of the making of the field trials, lisymeric experiments, greenhouse experiments, methods and technologies of the making of laboratory analyses for soils, plants and fertilizers, types and methods for the monitoring of the crop nutrition, methods selection, methods of the statistical analyses.

**The management of the quality of crop products.** The goal of the studding of the theoretical materials and laboratory classes are mastering for bachelor of the agrochemistry and soil science in theoretical knowledge and practical skills into optimization of the formation of the quality of crop products during the vegetation by making of the technical elements for improvement of the agrochemicals and other agrosources in modern crop rotations based on abiotic environmental factors, biotic environmental factors and anthropogenic factors, determination of the nutrients cycle according to crop damands, production damands and power management. These knowledge and skills lets to make and effective implement the complex of the operations for optimization of crop nutrition for improvement of the quality of crop products.

**Technology of rational land use.** The main place in the rational and efficient use of natural resources is the use of land, conservation and enhancement of soil fertility. Research, an understanding of all processes occurring in soils becomes an important condition for the realization of these tasks. Particularly relevant is the ability to manage soil processes and regimes and, on this basis, improve soil fertility. The modern ecological state of land resources in Ukraine and the priority tasks for their reproduction are considered. The Ukrainian and European methods of evaluation of soils and land plots are presented. Soil quality monitoring and new trends in the use of soil monitoring results are provided. The ways of qualitative estimation of the earths, the agitation of soils are given. The discipline acquaints with the national system of standardization in Ukraine of soils. The purpose of studying the discipline is to master the basic principles of certification of soils and lands depending on their specialized use.

**Soil mapping.** The main purpose of the subject "Soil Mapping" is research of land surface coverage of the Earth and respective regularities, as well as approaches for required calculations, providing and incorporation of the results to topographic maps. In the study process students learn the information about topography measures in nature, analyze methods, and construction and application of the soil, ecological, special maps. During the study period students produce a geomorphologic profile of a region, develop legends for the thematic maps, and carry out a map basic for further ecological research purposes.

**Soil conservation.** The course studies the main types of soil degradation and measures for their prevention, reduction or complete removal action. The aim of the course is to provide students obtaining knowledge about the current state of land resources of Ukraine, laws of Ukraine on land protection, causes, extents and consequences of land resources degradation as a result of natural processes and human activities as well as methods of preventing degradation and soil fertility reproduction.

**Optional Block 2.2 “Selection and Genetics of Agricultural Crops”**

**Agricultural microbiology.** The subject give knowledge about morphology, structure, classification, genetic, physiology and ecology of basis groups of microorganisms, their role in utilization of complex plant and animal remains, breaking them down into simpler chemical forms which are returned to the soil. The importance of microorganisms in human practice activity, microorganisms interaction between themselves and high plants, give knowledge about microbiological means of protection against diseases and pests of plant, perspective means of plant protection for graving harvest agricultural crops.

**Fundamentals of land management and land cadastre.** Efficient and effective use of land remain issues of concern in agricultural production. The basis of effective agricultural are the proper land use organization. And its basis is performed systematic, coherent organization of all elements of management. The course reveals the features of the state policy on formation of rational land ownership and land use, organizing areas of agricultural enterprises with the creation of spatial conditions that ensure the ecological and economic optimization of the use and protection of agricultural land, the introduction of advanced forms of management of land use, improving the value and location of the land, the system of crop rotation and hay-pasture rotation. It reveals a system of measures to preserve and improve the natural landscapes, restoration and improvement of soil fertility, protection from erosion.

**Land reclamation.** The discipline introduces students to the technological characteristics of applying hydroengineering, land clearance, chemical, agrotechnical and forest reclamations and forms students' competence in the technology of agricultural production on reclaimed lands. The discipline focuses on the development of new agricultural technology of irrigation (micro-, drip irrigation, etc.), which enables to increase significantly the yield of crops in terms of increasing climate aridity. The discipline ensures the students to obtain the basis of professional knowledge to improve soil productivity as well as preserve soil fertility in different climatic zones of Ukraine.

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

**Special genetic field crops.** Total problems the genetics of plants. Genetics determination and inheritance mechanisms of qualitative and quantitative traits. The specific nature of genetic systems for propagation of plants. Classification and karyology the primary agricultural crops: wheat, rye, barley, soya, pea, beet, corn, potato, sunflower, flax. The genetics of morphological, physiological and biochemical traits. The genetics mechanisms of plants resistance control against the agents of disease and invaders. Principal directions of selection by primary agricultural crops.

**Special breeding and variety studding crops.** Methods of breeding crops: selection, hybridization, polyploidy, induced mutagenesis, heterosis, biotechnology and genetic engineering. Laboratory evaluation of breeding material by product quality, the

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studying species, varieties and varietal characteristics appropriate and their cultivation technology, variety certification, agricultural variety crops suitable for dissemination in Ukraine.

**Seed-growing of the field crops.** Theoretical bases of seed-growing. A law of Ukraine "About seed and planting material". Organizational principles of seed-growing. A variety and hybrid are objects of seed-growing. Principles of conduct of seed-growing in economic conditions. Systems of seed-growing of basic crops. A production of seed is in the primary links of his reproduction. A value of biotechnology and genic engineering in the receipt of high-quality seed. Attestation requirements are to the subjects of seed-growing. The using of heterosis in a seed-growing. Features of seed-growing on sterile basis. Ecology of seed and ecological seed-growing. Principles of zonal seed-growing. The adaptation of national seed-growing to the international charts and procedures. International organization of control quality of seed. State and farming control in a seed-growing. The variety certification.

**Bachelor  
in specialty "HORTICULTURE AND VITICULTURE"  
field of knowledge "Agricultural science and food"**

Form of Training:	Licensed number of persons:
– Full-time	60
– Part-time	30
training period	4 years
Credits	240 ECTS
Language of training	English, Ukrainian
Qualification of graduates	Technologist of Agronomy

**Concept of training**

Preparation of bachelors in the specialty focused on current and future trends in the development of horticulture and viticulture. Education Bachelor specialty allows to acquire special skills and knowledge of innovative character in Horticulture to produce high quality and diversification of produce for domestic consumption and export. A graduate of this specialty theoretically and practically prepared, has the knowledge and skills of modern technologies in the field of horticulture and viticulture.

**Practical training**

Students undergo practical training in educational farms NUBiP Ukraine: NUBiP Ukraine "Agronomic Research Station," "Velykosnitynske educational and research farm named after O.V. Muzychenko," as well as advanced agricultural enterprises of different ownership forms, collection nurseries teaching and research fields NUBiP" Produce Garden "research institutions Academy of Agricultural Sciences and National Academy of Sciences of Ukraine, state-ampelohrafichnyh pomology inspections.

**Proposed Topics for Bachelor theses**

1. Features of new varieties of fruit, berry and nut crops and study their growth and fruiting.
2. Evaluation methods (measures) aimed at improving production technologies fruits and planting material of fruit, berry, nut and vine crops.
3. Hospodarsko biology grade varieties (heterosis or hybrid) different types of vegetables in order to highlight the most suitable for growing conditions in certain areas.
4. Vychennya some effective elements of technology of cultivation of vegetables, including effect of sowing (planting seedlings, bulbs, tubers, etc.), methods of preparation of seeds and planting material, methods of sowing (planting), density and forming plants, methods of irrigation, the application of plant growth regulators, biological products, etc. to obtain high yields and environmentally-friendly products .
5. Introduction of rare species of vegetables in order to highlight the most suitable for growing conditions in certain areas.
6. Optimizations of technology's methods of vegetable growing in different type's greenhouses.
7. Investigations of technological aspects of flower growing in Protected Cultivated.
8. Investigations of mushroom's technologies depended to growing's terms and technology's elements.
9. Experimental investigations for capacities of edibles and medical mushrooms in laboratories terms.

10. Modeling of highly efficient production of planting material and fruit grapes agrotechnical and economic analysis of growing conditions in farms of different ownership.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Place of employment of bachelors include: agricultural enterprises of different ownership, farms, greenhouse and mushroom plants, the structure of the supply of equipment and materials for greenhouses, structures engaged in landscape gardening, delivery of equipment, seeds, planting material, protection plants and materials for orchards, vineyards, research institutions.

**Bachelor`s Program and Curriculum  
in Specialty «Horticulture and Viticulture»  
Educational-professional program «Horticulture and Viticulture»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Botany	7	exam
CC 2	Agrophysics	6	exam
CC 3	Chemistry	10	exam
	(incl. inorganic and analytical organic, physical and colloidal)	5	exam
		5	exam
CC 4	Genetics	6	exam
CC 5	Plant physiology	6	exam
CC 6	Agrometeorology	5	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian Statehood	4	exam
OB 1.2	Ethnocultural	4	exam
OB 1.3	Philosophy	4	exam
OB 1.4	Physical training	4	test
<b>The volume of components of the general training cycle</b>		<b>66</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 7	Soil Science with the bases of geology	6	exam
CC 8	Entomology	4	exam
CC 9	Phytopathology the basics of virology	5	exam
CC 10	Farm equipment and instruments	4	exam
CC 11	Basic research	4	test
CC 12	Agriculture and herbology	6	exam
CC 13	Agrochemical service for vegetable growing, horticulture and viticulture	5	exam
CC 14	Plant Growing	6	exam
CC 15	Viticulture	7	exam
CC 16	Agrochemical chemistry	6	exam
CC 17	Fruit-growing	11	exam
CC 18	Vegetable growing	11	exam
CC 19	Selection of vegetable, fruit and berry crops	5	exam
CC 20	Technology of storage and processing of of fruits and vegetables	5	exam
CC 21	Standardization and commodity science of fruit and vegetable and viticulture	4	exam
CC 22	Economics, entrepreneurship and management in fruit and vegetable production	4	exam
CC 23	Mushroom growing	5	exam
CC 24	Technologies of Protected Cultivated	6	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.5	Ukrainian for professional purposes	4	exam
OB 1.6	Foreign language (English, German, French, Spanish)	4	exam
OB 1.7	Safety of work and life	4	exam
OB 1.8	Starting your own business based on business design	4	test
OB 1.9	Information technology	4	exam
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1 «Horticulture and Viticulture»</b>			
OB 2.1.1	Agricultural microbiology	5	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.1.2	Seeds of vegetable crops	4	exam
OB 2.1.3	Land reclamation	4	test
OB 2.1.4	Ornamental horticulture	4	test
OB 2.1.5	Biotechnology	4	test
OB 2.1.6	Pomology	8	exam
OB 2.1.7	Olegrafia	6	test
OB 2.1.8	Potato	4	test
OB 2.1.9	Ampelography	4	test
OB 2.1.10	Greenhouses	6	test
OB 2.1.11	Nursery	7	exam
OB 2.1.12	Beekeeping	4	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>184</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 25	Military training course	29	
CC 26	Academic Practice	23	
CC 27	Production Practice	5	
CC 28	Bachelor Thesis writing (Graduate thesis or Project)	4	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

### Annotations of Components in the curriculum

#### 1. GENERAL TRAINING CYCLE

##### Compulsory components

**Botany.** The aim of the course is learning patterns of plants and vegetation as an essential component of bioenergy biosphere. As a result, the study of botany student has to learn self-study method with a microscope, the self-production of medicines and analysis of the cellular and tissue level and at the level of individual organs and the whole organism, which is of great cognitive and practical importance. Therefore, the importance given to the organization and conduct summer field practical training during which students independently collect and plants, conduct research geobotanical certain types of vegetation, which is the final stage of study and analysis of the current state of vegetation, studied ways to improve forecasting of natural plant communities. The aim of the course is also a botany student mastery of botanical knowledge, botanical terminology necessary for conscious and competent study of other related disciplines that form the professional agricultural training profile.

**Agrophysics.** The aim of the course by students are obtain knowledge about the physical basis for the formation of berry productivity, agricultural and perennial plants. Argophysics studies the basic regularities of the production mechanism, methods and tools for optimizing the parameters agrophysical soil properties, gives reasons for forecasts a comfortable living environment fruits, berries, vegetables and other plants. On the basis of knowledge developed agrophysical scientific basis, methods, means and ahrozahody rational use of natural resources.

**Chemistry.** The theoretical principles of modern inorganic and analytical chemistry are considered. Basic laws of chemical reactions, especially processes that occur in nature, chemical and agricultural production are studied. Attention is focused on the peculiarities of chemistry of compounds of biogenic elements, their role in the life of

garden crops. The essence, advantages and disadvantages of various methods of analytical experiment are considered. Attention is drawn to the applied aspects of the methods of qualitative and quantitative chemical analysis of natural and artificial objects that are of great importance in horticulture and viticulture: soils, mineral fertilizers, plant protection products and seed treatment, horticultural products and viticulture etc. The main theoretical positions of organic chemistry, nomenclature, methods of obtaining and applying the main classes of organic compounds in various branches of agricultural production, their biological effect and the impact on the environment, and the mechanisms of chemical processes occurring in natural objects are studied.

**Genetics.** Discipline envisages the acquaintance of students with the basic divisions of genetics modern knowledge. Includes next divisions: bases of molecular genetics, structure and functions of proteins, nucleic acids and chromosomes, mechanisms of expression of genetic information, structure to the genome, cytogenetic aspects of inheritance of genes, changeability, her reasons and consequences, genetic systems of reproduction of plant organisms, genetic mechanisms of firmness of plants against the causative agents of illnesses and vermines, basis of population genetics. Discipline envisages listening of course of lectures, realization of practical employments and solution of tasks from all basic subdivisions from molecular biology to the population.

**Plant physiology.** Discipline is one of the basic disciplines in the training of specialists in "Agronomy". Discipline involves studying the functions of plant organism and the laws of its life. The role of the discipline is to provide future specialist deep and comprehensive knowledge of the biology of the plant cell, water regime of plant organism, mechanisms of respiration and photosynthesis, mineral nutrition, plant growth and development, adaptation and mechanisms of resistance to adverse environmental factors. Acquired knowledge of plant physiology will allow future specialists in the area of agriculture practice to implement the latest achievements of science, have scientific and professional approach to technologies in crop growing and to independently develop and adjust agronomic activities by understanding the physiological processes of plant organism.

**Agrometeorology.** Subject program provides for main issues of agricultural meteorology, influence of weather and climate changes on agricultural production objects. They are analyzed dangerous for agriculture weather phenomena, and methods of their controlling.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines "History of Ukrainian Statehood", "Ethnocultural", "Philosophy", "Physical Training" see Section 2.1.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

**Soil Science with the bases of geology.** The course study geological processes that form the the Earth's surface and soil conditions, mineralogical composition of the soil and rocks, the main types of parent rocks, structure, composition, properties and patterns of geographical distribution of soils, ways of their management in fruit plantations, vineyards, berry crops and measures to restore soil fertility. The purpose of discipline is to evaluate the suitability of garden soil, which lays the foundation for the successful modern gardening soil properties because neglect can occur many years. The study of soil fertility

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and appraisal in relation to fruit trees is important because technology's impact on the soil in gardening is much more than in agriculture.

**Entomology.** The course deals with Introduction to entomology and insect-pest management, including morphology, life processes, ecology and biology of key agricultural pests. Students are provided with knowledge of tactics of population suppression, and ecological backlash and level of entomophagous efficacy.

**Phytopathology the basics of virology.** Plant pathology studies phytopathology, reasons of their appearance features in development, symptomatology pathologies, species composition, morphology and bioecology of agents plant against pathogens, methods and systems of immunity, protection. On the basis of knowledge of phytopathology methods should be able to determine symptoms of disease to carry out identification of pathogens and diagnosis of diseases. On explicit data its need to conduct phytopathology monitoring as a result which it is differentiated to realize the prophylactic and therapeutic measures of control plant disease.

**Farm equipment and instruments.** The general issue of mechanization processes in crop, destination, general structure and workflow of machines for growing and harvesting crops and general issues of machinery use in crop. Study ways of regulating the working process and setting up machines and methods to control performance of the machines in a production environment. Consolidation of theoretical knowledge occurs during training practice.

**Basics of scientific research.** Lectures on discipline covers the theoretical foundations of research and their application in practice, planning and research in horticulture, the use of statistical methods and scheduling of research using computer programs. Laboratory and practical course dedicated to the study of methods and algorithms statistical analysis of experimental data, variation, variance, correlation and regression analysis and so on.

**Agriculture and herbology.** Discipline is one of the basic training of professionals in this specialty. As a result of the discipline the student should know the role of agriculture for horticulture and viticulture industry, possess the scientific principles and laws of Agriculture in accordance with this specialty. The problem weeds of orchards and berry fields will be relevant in horticulture and viticulture, so this discipline is one of the basic training to professionals of this branch. In the lecture course covers the scientific basis of herbology, characteristics and place of segetal plants in modern orchards and berry fields and measures and systems to control the presence of weeds in perennial plantations for various technologies of cultivation. Laboratory course devoted to the study of weeds and practical skills for monitoring and assessment of weeds and their impact on growth and development of perennial plantations. Future specialists can implement acquired knowledge by developing biologically and economically effective and environmentally acceptable system control weeds in orchards and vineyards, features of gardening and viticulture conditions for organic farming. The student must know the indicators of soil fertility, providing high efficiency of fruit and berry crops, vines, vegetables and melons, etc., regulation and ways of reproduction of soil fertility. Know the role and tasks of cultivation in the laying of gardens and vineyards, mechanical care for orchards, vineyards and berry. Possess measures of mechanical protection of fruit, berry and vegetable crops from pests. To know the scientific basis of special crop rotation; place of vegetables, melons and berries in rotation; agronomic requirements for planting vegetables and melons and measures for their care; the features of horticultural erosion in hazardous areas and soils contaminated with radionuclides and heavy metals; features of gardening and viticulture conditions for organic farming.

**Agrochemical service for vegetable growing, horticulture and viticulture.** The goal of the studying of the theoretical materials and laboratory classes is mastering for bachelor in horticulture and viticulture in theoretical knowledge and practical skills into

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basic of the agrochemical supply and agrochemical service agribusiness, monitoring and application of the chemicals in technologies processes of the vegetable, horticulture and viniculture, save and increasing of soil fertility according to environmental conditions, agrochemicals market, production systems specificity, supplying of the producers in the field of vegetable, horticulture and viniculture by resources and service of the chemicals.

**Plant growing.** The course forms the future specialists for growing grain, potato, sugar beet, sunflower seeds and other plant products. The course is based on knowledge of the field crops, especially their growth and development, requirements for environmental factors, the modern high yields technologies for growing the quality products at the lowest cost of labour and capital. As a result of the discipline studying the student should to know: state and prospects of plant growing, morphological and biological characteristics of field crops, modern technologies of cultivation, including intensive ways and means quality improving of agricultural products, reducing of means and labour costs for crops growing.

**Viticulture.** The objective of the study subjects are: formation of students' comprehensive knowledge (competencies) culture of grapes, including historical and botanical classification, biology and ecology of grape plants, technologies of industrial crops (forming and trimming bushes, cultivation, fertilization, irrigation, plant protection from diseases and pests) and the production of planting material and ways to improve the assortment. The issue of table viticulture and the production of dried products and features in non-traditional grape growing areas of viticulture (Forest-steppe, Polesie).

**Agrochemical chemistry (agrochemistry).** The goal of the studding of the theoretical materials and laboratory classes are mastering for bachelor in horticulture and viniculture in theoretical knowledge and practical skills into identify and resolve tasks chemization such as basic of the vegetable, horticulture and viniculture, estimation of the mineral and organic fertilizers, chemical ameliorants and special agrochemical peels, their effect on environment and quality of the products. And students take practical skills in fertilization of the vegetable and fruit crops and berries, schemes for fertilizers application of the minarel and organic fertilizers, etc.

**Fruit growing.** The main objective of discipline is to equip future professionals with the skills and knowledge of production technologies of fruits and berries, which are the basis of nutrition and raw materials to processing. In the process of teaching highlights the status and prospects of fruit; value anatomical and morphological and biological features of fruit and berry crops. We consider the physiology of stability garden plants to environmental factors and patterns of fruiting. Detailed analysis of modern cultivation technology yields high eco-friendly fruits and berries in different soil and climatic zones. Much attention is given to ways and means of improving the quality of products and measures for its maintenance, as well as ways to reduce labor costs and capital goods during cultivation.

**Vegetable growing.** This discipline is devoted to the study of biological foundations of vegetables, the features of the preparation and fertilization of soil, plant propagation, the seedlings' planting into the open ground, the common measures for plants' caring, the harvest and cultivation technology of the vegetable growing technologies in the open soil. Each theme highlights the economic importance; the cultivation technology of high-quality commodity of vegetable crops and melons; the management system of plant protection from weeds, pests and diseases in order to implement the latest technologies for the receiving the high-quality commodity, environmentally acceptable vegetable production; harvesting and post harvest handling. The morphological characteristics of vegetables and melons, their biological characteristics, the requirements for the growing conditions and the current state varietal diversity are studied in the laboratory practical classes. A study of the species composition of the seeds and their germination. The ways of propagation, the calculations in seedlings' needs of different vegetable crops are also considered. The

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methods of control and the regulation of temperature, lighting regime, carbon dioxide, humidity and nutrient regime are in this theme. The estimation in seeds' needs of various vegetables, the scheme of sowing and feeding area are considered. The organization of vegetable crop rotation.

**Selection of vegetable, fruit and berry crops.** Discipline examines the theoretical and methodological issues of creation of varieties, methods of breeding and selection, types of crosses, methods for source material selection major areas of vegetable crops in view of the structure and characteristics of the flower blooming and pollination. The basis of the study course is breeding advancements in breeding cabbage, carrots, cucumbers, tomatoes and other crops. The purpose of discipline is to develop the students' knowledge of the history of genetics and breeding of horticultural crops and features in the selection process of pome, stone fruit and berry species. The main objectives are: to study the theoretical foundations and methods to create new and improve existing varieties; search of donors and sources of valuable economic and biological features of the existing gene pool of plant resources; involvement in the selection process wild forms and varieties of folk selection that are adapted to adverse environmental conditions change areas of cultivation. As a result of the program, students should know: history, methods of selection, , organization of selection process and variety studies and also be able to: make breeding program plans to carry out the selection of parental pairs for crossing, hybridization, evaluation of breeding material and so on.

**Technology of storage and processing of of fruits and vegetables.** The course is studying the final course for the educational level "Bachelor" when students have learned technology of cultivation of vegetable, fruit and berry crops. The course studies the principles of scientific storage of fruits and vegetables, especially as their storage and processing facilities, the impact factors of cultivation and post harvest handling their quality and keeping quality, suitability for storage forecasting, and various kinds processing. The program provides study the discipline schemes post harvest handling crop grown fruits and vegetables, especially its transport depending on type of transport. will study the technological characteristics temporary, universal and specialized storages, especially the placement of their fruits and vegetables for short-term or long-term storage. Will be considered effective regimes and methods storage different kinds of fruits and vegetables, the ability to establish and maintain optimum parameters in storage regime types. Peculiarities storage of fruits, vegetables and berries in the conditions regulated and modified atmosphere. Ways to create a modified atmosphere and means to maintain optimal gas in storage environment. Assessment of quality of fruits and vegetables after storage, to prevent losses in quantity and quality. A separate module provides the study of modern technologies of fruit and vegetables. Requirements for study materials intended for processing. Students consider microbiological, physical, chemical preservation methods. Features making fermented, dried and frozen products from fruits and vegetables, natural canned vegetables, fruit and berry compote, getting juices, purees, jams and more. Basic processing potato. Assessment of quality of canned fruits and vegetables. Accounting, quality control and storage of finished products.

**Standardization and commodity science of fruit and vegetable and viticulture.** The course includes the study of the following issues: the goals and objectives of standardization, standardization essence of the science, teaching the basics of standardization, the issue of quality of horticultural products, standardization of quality products and the methods of control, international standards. General information about domestic and foreign experience of produce quality management, certification and metrology software. The development of the current requirements for fruit and vegetable products to the planned production of competitive products. The development of effective actions of product quality management in the production of high-quality, environmentally friendly, organic and competitive products. The development of principles and procedures

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for certification of products for the domestic market and export. Features creation and implementation in production systems ISO 9000 with the following quality management system accreditation. While teaching discipline taken into account existing laws on standardization, certification and safety of produce.

**Economics, entrepreneurship and management in fruit and vegetable production.** A course foresees the study economics of the system of agrarian relations of productions in intercommunication with development of productive forces of agriculture. Criteria and indexes, which characterize development of agricultural production, ways and methods of the rational use of earth, financial and labours resources, are herein examined. The necessity of development and improvement of resource potential of agriculture opens up, the method of determination of economic efficiency of agricultural industries is given. The terms of forming of prime price and profitability of products of agriculture, development and functioning of market of food light up. The problems of intensive development of industries of agriculture are studied on the basis of the wide use of industrial technologies, rational placing and specialization of agricultural production on the base of agro industrial integration in the conditions of relations of markets.

**Mushroom's growing.** The biological capacities of cultivation's mushrooms, their requirements for the growing's terms are learnt. Especially for the medical capacities of hat's mushrooms. Constructions capacities of champignons and principles their equipments to the tools for the providing optimal micro climate's parameters are showed. The technology's details of receiving to the mycelium, making up of substrates and base to the mushrooms the main cultivation mushrooms (*Agaricus bisporus*, *Pleurotus ostreatus*, *Lentinula edodes* etc.) are introduced. As a technologies for the growing of few common mushrooms groups.

**Technologies of Protected Cultivated.** The technology of vegetable crops in different types of greenhouse's constructions are studied. As a variety's choice for the specific, microclimate's terms and its parameters in winter and plastic greenhouses. For example a nutrient solutions, plants forming and another agro technical methods in such terms. Especially important for the greenhouse's nutrient soilless, substrates to prepare to the nutrient solutions for the hydroponic methods dependent to the cultures and their growth's phases.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines "Ukrainian for Professional Purposes", "Foreign Language (English, German, French, Spanish)", "Labour and Life Safety", "Starting your own business based on business design", "Information technology" see Section 2.1.

#### ***Optional Block 2 (Student's Choice)***

##### ***Optional Block 2.1«Horticulture and Viticulture»***

**Agricultural microbiology.** The subject give knowledge about morphology, structure, classification, genetic, physiology and ecology of basis groups of microorganisms, their role in utilization of complex plant and animal remains, breaking them down into simpler chemical forms which are returned to the soil. The importance of microorganisms in human practice activity, microorganisms interaction between themselves and high plants, give knowledge about microbiological means of protection

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against diseases and pests of plant, perspective means of plant protection for graving harvest agricultural crops.

**Seeds of vegetable crops.** The course examines issues of organization and system of seed production of vegetable crops in Ukraine, the theoretical foundations of seed and seed-quality control features growing major vegetable seeds.

**Land reclamation.** The program of the course aims at familiarizing students with different types of reclamation activity as a set of measures for the comprehensive improvement of adverse environmental conditions. The main focus in the course of discipline study is given to the opportunities and technological characteristics of the innovations in land reclamation, namely micro-irrigation, fertigation, etc. These elements of agricultural technology are an important component of obtaining high-quality fruits and vegetables, both in open and protected ground. Learning the discipline enables the students to gain a professional competence in the correct adaptation of modern reclamation measures in the scientifically grounded system of horticulture, vegetable growing and viticulture.

**Ornamental horticulture.** Discipline creates competence of the students in biology woody and herbaceous ornamentals various uses. Introduces the range and their methods of reproduction (seeds, rhizomes, bulbs, jigging, cuttings, root shoots, vaccinations, etc.). Program course "Ornamental Horticulture" supposed to study the history of ornamental horticulture, development of its main styles, classification ornamental plants. Attention is focused on the basic elements (lawns, flower beds, ridges, arabesque, alleys, linear plantations boksety, hedges, borders, pergolas, tapeworm, curtains, etc.). Main types of systems and greenery. We consider the technology of the decorative planting and care.

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

**Pomology.** The course studies the economic and biological features of fruit and berry crops and their variability depending on natural and agro-climatic conditions, varieties origin and requirements to their farming. Consider the question of maintaining existing varieties and their further improvement through clonal selection, introduction, zoning varieties from industrial and biological study of a particular region. Learning the basics of pomology will help future gardeners intelligently navigate the vast diversity of varieties of fruit and berry plants correctly chosen the best for mass propagation in nurseries and cultivation of industrial and amateur stands in a particular sector or climatic region. It teaches the basics of determining potential varieties for use in breeding as donors or sources of signs.

**Olegrafia.** In it's given origin, history of cultivating and inner species categorizations of (subspecies', varieties, and varieties type, varieties) vegetable and melons-field crops for group. The variety is the main object on which is directed cultivation technology. It was showed the analysis of the varieties resources' condition in Ukraine and their role in the production of agricultural output. Deeply motivated selection varieties and hybrids for determined of growing technology of vegetable crops and different directions of vegetable growing. On practically-laboratory lessons are studied certain varieties and hybrids of the vegetable and melons-field crops' of their different types of sort. They are study systems of approbations and identification sign, particularities of the expert operation of varieties on VOS - a test of vegetable and melons varieties.

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**Potato.** Subject program involves the study of technology growing stable yields of potatoes in different soil-climatic zones with high lezhkozdatnistyu, product quality, technological and culinary properties. The issue of development and quality control of potatoes on the way from the field to the consumer, the requirements of technical standards for the quality of potatoes for various purposes, resource assortment of potatoes.

**Ampelography.** He studies the types and grape varieties, patterns of morphological variability, agrobiological and economic and technological properties by the environment and humans. Ampelography divided into general and partial. Total ampelography studying the taxonomy, classification and origin of the grapes. Partial studies ampelography some varieties gives them a botanical description, agrobiological and economic and technological characteristics and methods of determination. Ampelography helps determine varietal grapes fund, issues zoning and specialization varietal wine, grape promoting culture in new regions, selection and use grades as a starting material in the selection process, the maintenance of varietal farming.

**Greenhouses.** The scientific and innovations aspects of developing of modern greenhouses, their modernizations and reconstructions methods of climate's variations and connecting of micro climate's capacity's are learnt. This discipline introduces the cycle of technical engineering greenhouse's systems and principles of greenhouses equipment's jobs.

**Nursery.** The program provides introduction to the history, current state and prospects nursery in Ukraine and abroad, studying biological basis propagation of fruit and berry plants by growing basic planting material. The program includes fruit nursery structure and organization of its territory, requirements for soil and climatic conditions, basic principles of calculation area offices. The basis of the program is the study of rootstocks of fruit, berry and nut crops, the main technologies of the grafted and rooted planting material, knowledge of modern standards and rootstock seedlings, planting material storage technologies.

**Beekeeping.** The discipline studies required to get the students knowledge on plants honey and pollination of crops by bees. Expected learning products plants collected bees for their power and provide a marketable product. Served as melliferous plants characteristic of plants, their classification, use to create tricks in different periods of the season. Reveals the role of bees as pollinators of plants, equipment and organization pollination of various crops, effectiveness in increasing yields of fruit and seeds.

### **2.3. FACULTY OF PLANT PROTECTION, BIOTECHNOLOGY AND ECOLOGY**

**Dean** - doctor in agricultural sciences, professor, academician of the NAAS of Ukraine **M.M. Dolya**

Tel.: (044) 527-86-99 E-mail: zr\_eco\_bio\_dep@i.ua

Location: Building № 4, Room 42

The faculty organizes and coordinates Bachelor training in the following specialties:

#### ***202 Plant Protection and Plant Quarantine***

Educational-professional Program «**Plant protection and plant quarantine**»

Graduating departments:

Department of Entomology named after Prof. M.P. Diadechko

Tel.: (044) 527-89-78, E-mail: entomologia@ukr.net

Head of the department – PhD in Agricultural Sciences, Associate professor, Y.O. Likar

Department of Phytopathology named after Academician V.F. Peresyphkin

Tel.: (044) 527-82-11, E-mail: lkriuchkova@nubip.edu.ua

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

Department of Integrated Protection and Plant Quarantine

Tel.: 527-82-12, E-mail: kaf.izkr@gmail.com

Head of the department – PhD in Biological Sciences, Associate professor, A. G. Babych

#### ***162 Biotechnology and Bioengineering***

Educational-professional Program «**Biotechnology and Bioengineering**»

Graduating department:

Department of Ecobiotechnologies and Biodiversity

Tel.: (044) 527-85-17, E-mail: eko\_bio@nubip.edu.ua

Head of the Department – Doctor of Agricultural Sciences M. V. Patyka

#### ***101 Ecology***

Educational-professional Program «**Ecology**»

Graduating department:

Department of Agricultural Sphere Ecology and Ecological Control

Tel.: (044) 527-81-95, E-mail: eco\_dep@gmail.com

Head of the department – Doctor of Agricultural Sciences, Professor V. M. Chaika

**Bachelor**  
**field of knowledge " Agricultural science and food"**  
**In specialty "PLANT PROTECTION AND PLANT QUARANTINE"**  
**Educational-professional program**  
**"PLANT PROTECTION AND PLANT QUARANTINE"**

Form of Training:	Licensed number of persons:
– Full-time	75
– Part-time	50
Duration of Training	4 years
Credits	240 ECTS
Language of Teaching	Ukrainian, English
Qualification	Bachelor of plant protection and plant quarantine

### Concept of training

Experts in Plant Protection develop systems of protective measures against harmful organisms. They have to know the methods of diseases diagnostics, identification of pathogens, determination the species composition of phytophagous, entomophagous and weeds, know their biology and ecology, explore the economic threshold of harmfulness and develop forecasts and the occurrence of pests and diseases.

### Practical training

Teaching and research farms of NULES of Ukraine: PC of NULES "Agronomic Research Station", "Velykosnytinske Education and Research Farm named after O. Muzychenko", Education and Research Farm of NULES of Ukraine "Fruit and Vegetable Garden".

### Proposed Topics for Bachelor theses

1. Biological features and harmful herbivorous insect of agricultural crops.
2. Phenology of entomopathogenic nematodes – parasitic pests – in growing ornamental plants.
3. Development features of root rot of crops.
4. Integrated action of after stair herbicides on agricultural crops.
5. Species composition and hazard of similar to mouse rodents on agricultural crops and their products.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### Employment of Graduates

The Classifier of occupations in Ukraine DK 003-95 (2006) for graduate level "Bachelor" set qualification "Inspector Plant Protection" (code 3212 CE). Graduates may find employment specialists in pest control services, research institutions, control and laboratory toxicological and biological plant protection in farms of different ownership or to continue studies in master.

**Bachelor`s Program and Curriculum in Specialty  
«Plant Protection and Plant Quarantine»  
Educational-professional Program "Plant protection and plant quarantine"**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Higher mathematics (professional orientation)	3	exam
CC 2	Fundamentals of computer science	3	exam
CC 3	General microbiology	3	exam
CC 4	Biophysics	3	exam
CC 5	Inorganic and analytical chemistry	6	exam
CC 6	Organic chemistry	3	test
CC 7	Physical and colloidal chemistry	3	test
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian Statehood	3	exam
OB 1.2	Ethnocultural	3	exam
OB 1.3	Philosophy	4	exam
OB 1.4	Ukrainian for professional purposes	4	exam
OB 1.5	Foreign language (English, German, French, Spanish)	5	exam
OB 1.6	Physical training	6	exam
OB 1.7	Labour and life safety	3	exam
OB 1.8	Legal culture of personality	3	test
<b>The volume of components of the general training cycle</b>		<b>55</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 8	Botany	3	exam
CC 9	Plants Physiology with the bases of chemistry	3	exam
CC 10	Genetics	2	exam
CC 11	Farming	3	exam
CC 12	Soil science with the bases of geology	3	exam
CC 13	Agricultural chemistry	3	exam
CC 14	Crop production with basics of fodder production	4	exam
CC 15	Selection and seed farming	2	exam
CC 16	Economics and business management	4	exam
CC 17	Fundamentals of scientific research in plant protection	3	exam
CC 18	Mechanization, electrification and automation of agricultural production	4	exam
CC 19	Technology of storage and processing of crop production products	3	exam
CC 20	Fruit and Vegetable growing	3	exam
CC 21	General entomology	5	exam
CC 22	General plant pathology	5	exam
CC 23	General mycology	5	exam
CC 24	Quarantine of plants	4	exam
CC 25	Rodentology	3	exam
CC 26	Agricultural entomology	6	exam
CC 27	Agricultural plant pathology	6	exam
CC 28	Plant disease prognosis	3	exam
CC 29	Quarantine and adventitious weeds	3	exam
CC 30	Pest monitoring	3	exam
CC 31	Plant immunity.	3	exam
CC 32	Chemical protection with the bases of toxicology	5	exam
CC 33	Agricultural Meteorology	3	test

Optional components			
<i>Optional Block 2 (Student's Choice)</i>			
OB 2.1.	Fundamentals of biotechnology in plant protection	4	exam
OB 2.2	Biological protecting of plants from wreckers	4	exam
OB 2.3	Standardization and quality management of plant products	4	test
OB 2.4	Latin	4	exam
OB 2.5	Agricultural zoology	6	exam
OB 2.6	Beekeeping	6	test
OB 2.7	Diseases of medicinal plants	4	test
OB 2.8	Diseases of edible mushrooms.	4	test
OB 2.9	Protection edible mushrooms from pests	4	test
OB 2.10	Mites and Nematodes,	4	test
<b>The volume of components of the special (professional) training cycle</b>		<b>164</b>	
3. OTHER TYPES OF TRAINING			
CC 3.1	Military training course	29	
CC 3.2	Academic Practice	12	
CC 3.3	Production Practice	5	
CC 3.4	Bachelor Thesis writing (Graduate thesis or Project)	2	
CC 3.5	State Attestation	2	
CC 3.6	Total for Specialty (without Military training course)	17	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Higher mathematics (professional orientation.** Elements of analytical geometry. Linear algebra. Math analysis. Differential calculation of the one of current values. Investigations of functions by methods of differential changes. Indefinite and definite integral. Differential equations. Rows.

**Fundamentals of Computer Science.** Calculation technique and information in Forestry. Program micro calculators (MC). Work in the automatic regime and program on MC. Structure, database and software of electronic machines. Personal computers. Packs of programs and their practical using. Program languages. Program of tasks. Tasks solving by personal computer.

**General Microbiology.** Microorganisms. Exchange of nutrition's. Microbial and soil fertilizing substances. Microbiology of water, air, forage. Morphology and chemical composition of virus. Virus diseases and their control.

**Biophysics.** Mechanics, kinematics and dynamic of point and hard body. Molecular physics and thermodynamic. Electrostatics. Electric current and electromagnetism. Waves. Optics. Elements of quantum mechanics. Structure of nuclear. Radiation. Radiation influence on biological objects.

**Inorganic and analytical chemistry.** is the study of the synthesis and behavior of inorganic and organometallic compounds. Subject includes the theoretical foundations of modern analytical chemistry. In Analytic Chemistry it is shown the foundations of Qualitative and Quantitative Analyses of above mentioned compounds of bio-elements and their practical use in agricultural production.



**Organic Chemistry.** Structure, method of extraction, physical and chemical properties, as well as practical use of the main classes of organic substances such as carbohydrates, spirits, aldehydes, ketones, amines, acids, heterocyclic substances. Studying of properties of amino acids, carbohydrates, lipids, nuclear acids and proteins.

**Physical and Colloidal Chemistry.** Physical and chemical properties of compounds and solutions. Structure, functions and metabolism of proteins, carbohydrates, amino acids, nuclear acids, vitamins, ferments, macro and microelements, which form the basis of tissue composition. Biochemical processes which form the basis of functional activity of certain organism organs and systems.

### Optional components

#### *Optional Block 1 (University Choice)*

Annotations of disciplines "History of Ukrainian Statehood", "Ethnocultural", "Philosophy", "Ukrainian for Professional Purposes", "Foreign Language (English, German, French, Spanish)", "Physical Training", "Labour and Life Safety", "Legal Personal Culture" see Section 2.1.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Botany.** Structure of cell, tissue, vegetative and generative organs. Difference of plant's world. Features of different groups of lowest and high plants. Genesis of plants, its role in forestry. Morphology. Productivity of wood biogenesis and actual questions of its rational use and protection.

**Plants Physiology with the bases of chemistry.** Physiology of plant cell. Water cycle in plants. Photosynthesis. Breath. Mineral nutrition. Synthesis and transformation of organic matters. Growth of plants. Fruit and seeds ripening. Adaptability and suitability of plants.

**Genetics.** Studies key laws of heredity and variability of organisms, explains principles of storage, transfer and implementation of genetic information including cytological and molecular fundamentals of heredity, regularities of inheritance of sex, properties (drawbacks, diseases) linked inheritance, basics of genetic engineering, populations and pure lines, basics of immunogenetics.

**Farming.** Soil; fertility and its verifications, soil reproduction, scientifically basis of agriculture and its practical usage, general concepts of agriculture and its practical usage, theoretical principles of crop rotation and its practical usage in the different soil-climatic zones of Ukraine and the land and its protection of soil erosion, agricultural system and its local peculiarities.

**Soil Science with the Bases of Geology.** Soil science is science, which studies genesis, development, structure, composition, properties and laws of geographical distribution of soils, ways of their rational use and restoration of fertility.

**Agricultural chemistry** includes theoretical and practical problems of crops nutrition and fertilization. They are considered studies on chemical melioration, organic and mineral fertilizers characteristics, and features of their application for different crops. The issues of nutrients balance, fertilization system, joint application of fertilizers and plant protectors are discussed. The attention paid to agriecological aspect of fertilization.

**Crop production with basics of fodder production** studied modern intensive technologies of food, industrial and fodder crops cultivation. Course based on knowledge about field crops, features of their growth and development, requirements to the environmental factors, up to date tools and technologies of agricultural crops cultivation which provides obtaining of high yields with appropriate quality with minimal labor and finance expenses. Course forms appropriate professional ideology, provides with system of theoretical and applied knowledge's and skills to implement it in practice.

**Selection and Seed Farming.** Discipline is devoted to studying of modern situation in selection and to the last advances in this sphere, agricultural demands to production of species and their hybrids, tasks and focus area of selective work, technologies of selection process, modern methods of creation of new kinds and hybrids of field crops.

**Economics and business management.** Formation of knowledge about economic relations and social form of production, efficient use of scarce productive resources and ways to ensure public needs in different socio-economic formations.

**Fundamentals of scientific research in plant protection.** The lecture course on the subject covers the theoretical foundations of scientific research and their application in practice, planning and research in agronomy, the application of statistical methods in agronomic research and planning of scientific research using computer applications. Laboratory - practical course focuses on the study of methods and algorithms for statistical analysis of experimental data: variation, variance, correlation, regression, Pearson analysis, probit analysis.

**Mechanization, electrification and automation of agricultural production.** The purpose of studying discipline is to provide students with theoretical knowledge and practical skills in the field of mechanization, electrification and automation of technological processes of agricultural production. Academic discipline is complex and consists of coherent and technologically related sections: tractors and automobiles, agricultural vehicles; electrification and automation of technological processes of agricultural production.

**Technology of storage and processing of crop production products.** It is a special discipline that studies technology of postharvest handling of cereals, legumes, grouts crop, oilseeds, fruit and vegetable crops, sugar beets, hop, tobacco, methods of short and long-term storage, bases of processing. This is final discipline after learning technologies of growing cereals, legumes, grouts crop, industrial crops, vegetables, fruits and berries.

**Fruit and Vegetable growing.** The lecture course of the discipline highlights issues of biological bases of vegetables crops, peculiarities of soil preparation and fertilization, plant propagation, seedlings growing, general measures of plant protection, harvesting and the principles of vegetables crops rotation. When considering vegetable growing in the open, technology of growing cabbage, carrot, table beet, onion, tomato, eggplant, cucumber, lettuce, dill, sorrel, horseradish is shown. At the laboratory-practical classes morphological characteristic of vegetable crops and their classification are studied. Study of species composition of seeds, their germination is carried out. Methods of propagation, accounting of seedlings quantity for different crops both field and greenhouse have been studied. The program provides studying fruit and berries, their importance, morphological and biological peculiarities, methods of propagation, rootstocks, the structure of the nursery, technologies of growing plantings, establishment of orchards, systems of soil management and treatment in the orchards, fertilization and irrigation of plantings, fruit trees forming and pruning and other operations in orchards, preparation and technologies of harve **General entomology**, as a Theoretical and a professional discipline enables the future specialists to get acquainted with the peculiar features

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of external structure of insect, the functioning of living organs and their systems, life cycles, multiformity of species and intraspecific forms and their interaction among themselves and the environment surrounding.

**General plant pathology.** Program foresees acquaintance of students with science on plant diseases and factors, which cause diseases, influence of ecological conditions on its development. Considerable attention is paid to disease diagnosis, pathogen ecology, its classification, morphological and biological peculiarities and methods of plant protection from diseases.

**General Mycology.** Course of "General Mycology" makes students to get acquainted with morphological and biological peculiarities and spreading of fungi, its role and meaning in human life and agriculture.

**Quarantine of plants.** Modern knowledge of fito-sanitary legislation, order and methods of fito-sanitary examination, biology of quarantine and other harmful organisms, absent, on territory of the country.

**Rodentology. (Harmful rodents and lagomorphs)** includes the study of a large number of pests, their systematic position, anatomical, morphological, physiological, and biological and ecological characteristics related to the two groups of animals

**Agricultural entomology.** The course deals with Introduction to entomology and insect-pest management, including morphology, life processes, ecology and biology of key agricultural pests. Students are provided with knowledge of tactics of population suppression, and ecological backlash and level of entomophagous efficacy.

**Agricultural Plant Pathology** studies the crop diseases and works out the system of protection measures from one or group of diseases sting crops, biological peculiarities and technologies of small fruit crops growing.

**Plant disease prognosis** (Prognosis of crop disease development is a part of integrated plant protection system and basis for planning and timely usage of all protection measures).

**Quarantine and adventitious weeds** Is one of the basic disciplines of training specialist in plant protection. The lecture course covers scientific basic herbology, characteristics and location of sagittal vegetation in modern agrophytocoenoses and its negative impact on crops. The course measures with weed-infested control systems in modern farming systems. Laboratory course is devoted to weed studying and acquisition of practical skills development systems of weed control in field crops.

**Pest monitoring** course is focused at methods and methodologies of pests sampling and collection in agricultural fields at modern crop rotation and technologies of production. The apart of the courses is phenology and mapping of insect communities structure in agricultural biocoenosis.

**Plant immunity.** Plant immunity studies crop resistance to principal factors, which define its immunity to harmful organisms and includes some working steps of selection of new plant varieties and hybrids resistant to diseases and pests.

**Chemical protection with the bases of toxicology.** The educational discipline studies main methods of experiment organization, main principles and level of its planning, demands to researches in Plant Protection, statistical analysis of results obtained.

**Agricultural Meteorology** Subject program provides for main issues of agricultural meteorology, influence of weather and climate changes on agricultural production objects. They are analyzed dangerous for agriculture weather phenomena, and methods of their controlling.

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## Optional components

### *Optional Block 2 (Student's Choice)*

**Fundamentals of biotechnology in plant protection.** The course provides an opportunity to learn basic skills and techniques of plant culture in vitro, to obtain transgenic plants and plant resistant to herbicides, diseases, adverse environmental conditions.

**Biological protecting of plants from wreckers** study questions of application of different biological facilities are studied in protecting of plants from harmful organisms, including microbiological preparations, mass breedings of insects and pliers in biolaboratories, use BAS, and also combination of biological method, with other methods of defence of plants.

**Standardization and quality management of plant products.** The discipline provides students with knowledge of theoretical basis of standardization in Ukraine, basis of quality management, methods of plant product control, norms of plant product quality and basis of product certification.

**Latin.** The main objective of the course at the faculty of Plant Protection is to teach students of Latin terminology, operating in botany, plant pathology and zoology, open access to a free and conscious perception of biological nomenclature, which is an essential element in the formation of high-grade specialist in agro-profile.

**Agricultural zoology.** Studying of this course allows to get familiar with biological laws of development of living organisms, principles of animal systematic and evolution of. Attention is paid to modern taxonomy, species biodiversity, morphology of different animal types as well as life process and cycles, effect of environment and the role that pests and beneficial species play in ecosystems.

**Beekeeping.** Preparation of highly qualified specialists in the field of plant based on modern achievements of a number of special subjects. The introduction of modern technology in beekeeping cannot successfully take place without increasing the overall culture of Beekeeping Livestock. Get high productivity of bee colonies is only possible through the introduction of technological methods of keeping and breeding, which should be based on a high genetic potential, the optimal conditions for growth and development of bees, compliance with sanitary rules and regulations.

**Diseases of Medicinal Plants.** Discipline studies diseases of medicinal plants, pathological process, the main pathogens, its development conditions, and protection methods from them.

**Diseases of edible mushrooms.** Discipline studies diseases of cultivated mushrooms, peculiarities of its infection and pathological process, characterizes the main disease agents of edible mushrooms, conditions of its development and protection measures from them.

**Protection edible mushrooms from pests.** The discipline deals with biology of edible mushroom pests and methods of their control.

**Mites and Nematodes** The content of the subject includes the study of the species composition, morphological and biological features of modern monitoring, hazard and environmentally safe measures to control the size of the main species of nematodes and mites.

**Bachelor**  
**field of knowledge "Chemical and Bioengineering"**  
**in specialty " BIOTECHNOLOGY AND BIOENGINEERING "**  
**Educational-professional Program "«Biotechnology and Bioengineering"**

Form of Training:	Licensed number of persons:
- full-time study	100
- part-time	50
training period	3 years 10 months
Credits	240 ECTS
Language of training	Ukrainian, English
Qualifications of graduates	Bachelor of biotechnology 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.

### Proposed Topics for Bachelor theses

1. Getting crymophylactic lines rapeseed (*Brassica napus* L) in culture in vitro.
2. Biotechnological production bases and the use of entomophagous on maize crops.
3. Granulation of hop cones in the technology of industrial production of beer.
4. Obtaining virus-free material manor verbena hybrid by biotechnological method.
5. Phylogenetic features of Ukrainian isolate of potato virus X-based analysis of the CP gene fragment.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### Spheres of Bachelors employment

Graduates work in the food, chemical and biotechnology industries, institutions and environmental health surveillance in control and analytical laboratories, centers of certification, commercial firms, research and design institutes and institutions of Ministry of Education, Academy of Sciences of Ukraine, core public administration, higher and secondary schools.

**Bachelor`s Program and Curriculum in Specialty  
«Biotechnology and Bioengineering»  
Educational-professional Program "«Biotechnology and Bioengineering"**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Political Science	3	exam
CC 2	Higher Mathematics	7	exam
CC 3	Physics	7	exam
CC 4	General and Inorganic Chemistry	6	exam
CC 5	Organic Chemistry	6	exam
CC 6	Analytical Chemistry	6	exam
CC 7	Physical and Colloid Chemistry	7	exam
CC 8	Engineering and Computer Graphics	3	exam
CC 9	Computational Mathematics and Programming	3	exam
CC 10	Economics and Organization biotech industries	4	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian Statehood	3	exam
OB 1.2	Ethnocultural	3	exam
OB 1.3	Philosophy	4	exam
OB 1.4	Ukrainian for professional purposes	4	exam
OB 1.5	Foreign language (English, German, French, Spanish)	5	exam
OB 1.6	Physical training	6	exam
OB 1.7	Labour and life safety	3	exam
OB 1.8	Legal culture of personality	3	test
<b>The volume of components of the general training cycle</b>		<b>84</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 11	Biochemistry	7	exam
CC 12	Ecology	2	exam
CC 13	Cell biology	5	exam
CC 14	General Microbiology and Virology	8	exam
CC 15	General Biotechnology	8	exam
CC 16	Genetics	8	exam
CC 17	Biotechnological processes and equipment manufacturing	9	exam
CC 18	Automation biotech industries	4	exam
CC 19	Regulatory support biotech industries	5	exam
CC 20	Fundamentals of designing	5	exam
CC 21	Instrumental methods of analysis	3	exam
CC 22	Computer technology and programming fundamentals	3	exam
CC 23	Radiobiology and radioecology	3	exam
CC 24	Basics of biodiversity	3	exam
CC 25	Proteomics and genomics viruses	3	exam
CC 26	Biosafety (the use of biotechnology)	3	exam
CC 27	Plant physiology	4	exam
CC 28	Industrial biotechnology	4	exam
CC 29	Applied ecology	3	exam
CC 30	Bioengineering	3	exam
CC 31	Introduction to the profession	3	exam
CC 32	Immunogenetics	2	exam
CC 33	Molecular biothechnology	4	exam
CC 34	Biotechnology of microbial synthesis of drugs	3	exam
CC 35	Biotechnology of production of microbial products for agriculture	3	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

CC 36	Ecological biotechnology	4	exam
CC 37	Objects of biotechnological production	3	exam
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1 «Environmental biotechnology»</b>			
OB 2.1.	Environmental toxicology	4	exam
OB 2.2	Bioenergy systems in agrarian production	4	exam
OB 2.3	Technologies of bioproduction	4	exam
OB 2.4	Fundamentals of plant biotechnology	4	exam
OB 2.5	Bioconversion of waste	4	exam
<b>Optional Block 2.2 «Agricultural biotechnology»</b>			
OB 2.6	Environmental security in agriculture	4	exam
OB 2.7	GIT and environmental display	4	exam
OB 2.8	Agricultural biotechnology	4	exam
OB 2.9	Biomethods of plant protection	4	exam
OB 2.10	Biotechnological processes of agritechnologies	4	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>139</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 3.1	Military training course	29	
CC 3.2	Academic Practice	10	
CC 3.3	Production Practice	4	
CC 3.4	Bachelor Thesis writing (Graduate thesis or Project)	2	
CC 3.5	State Attestation	1	
CC 3.6	Total for Specialty (without Military training course)	17	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Politics.** Contents of discipline involves the examination of distinct political sphere of society. Understanding the purpose, structure and functions of politics and power that allows you to objective knowledge and practical skills of political activity.

**Higher mathematics.** The examples of basic concepts and methods of discipline to demonstrate the laws of nature, the essence of the scientific approach, the specificity of the subject and its role in science and technology.

**Physics.** Purpose of the discipline formation in physical science students thinking, in particular, a proper understanding of the limits of the use of different physical concepts, laws, theories and skills to assess the likelihood of outcomes.

**General and inorganic chemistry.** The aim of the course of General and Inorganic Chemistry is to provide knowledge about the properties, methods of preparation and application of chemical elements and their compounds, skills performance chemical experiment.

**Organic Chemistry.** Mastering the basic concepts of organic chemistry, the study of the synthesis and analysis of organic substances, processes of purification, separation and identification of mixtures tification, strengthening skills in the chemical laboratory

**Analytical chemistry.** Discipline examines the theoretical and practical issues of qualitative and quantitative chemical analysis. Specifically discusses the basic requirements for chemicals, reagents and analytical reactions, the concept of separation methods and concentration of cations, anions substances. Methods acid-base titration.

**Physical and colloid chemistry.** Properties and structure of substances based on their chemical composition, structure and living conditions, the study of chemical reactions and other forms of interaction between particles or chemicals depending on their composition, structure and terms of the processes, study, interpret and determine ways to apply the basic laws of physical chemistry, knowledge of the laws of phenomena that occur at the boundaries of the phases and their use for electrochemical and catalytic processes.

**Engineering and Computer Graphics.** General engineering training course, the subject of which is the construction and reading of drawings, sketches, technical drawings and diagrams. Study courses allow students to read blueprints, design parts of drawings for various purposes, to know and to use state standards in project documents, maintain project documentation.

**Computational Mathematics and Programming.** Studying the structure of computer hardware, software for calculation methods on a personal computer, the rules of working with text blocks to design computational algorithms of calculations using spreadsheet and mathematical processors, basic algorithms, programming, elements of Computational Mathematics and Informatics.

**Economics and Organization biotech industries.** Study on the economic substance and business enterprises, their place and role in the market economy mechanism of creation, operation and management of agricultural businesses using biotechnology. Consider the criteria and indicators of the development of biotechnological production, ways and means of rational use of land, material and labor resources. Method of determining the economic efficiency industries are served. The conditions of the costs and profitability of agricultural and biotechnology industries as well as financial services, operation of business enterprises are highlighted.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines "History of Ukrainian Statehood", "Ethnocultural", "Philosophy", "Ukrainian for Professional Purposes", "Foreign Language (English, German, French, Spanish)", "Physical Training", "Labour and Life Safety", "Legal Personal Culture" see Section 2.1.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

**Biochemistry.** The study of the chemical composition, structure, transformation of matter and energy that occur in living organisms, particularly plants. Obtaining knowledge on the subject will allow students to determine the flow patterns and the relationship between different metabolic pathways, the principles of regulation and topography, as in the cells, the body as a whole. Establishing patterns of metabolic major classes of organic compounds – carbohydrates, proteins, fats, vitamins, etc., allows you to create appropriate conditions for crops that provide a maximum number of the substance.

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**Ecology.** Examines patterns of interaction between society and nature, the main environmental issues that arise in today's industrial production, the impact of the changed environment on humans, environmental protection, restoration and sustainable use of natural resources, environmental quality management based on modern advances in science, engineering and technology to protect environment.

**Cell biology.** The structural organization of the cells of living organisms, evolution of living organisms on the planet, research methods, and concepts of cellular signals apoptosis are studied.

**General microbiology and virology.** The course provides knowledge and current understanding of the morphology, ultrastructure, taxonomy, genetics, physiology and ecology of microorganisms, their metabolism and role in the transformation of organic and inorganic substances in the processes of soil and improve soil fertility. The acquisition of theoretical bases and student's practical skills in the study of viruses and how to limit their spread. Special part involves mastering techniques that are necessary to work with viruses of plants and animals, and in particular the methods of diagnosis and viruses identification.

**General biotechnology.** Biotechnology culturing isolated cells and tissue culture of isolated protoplasts, as a basis for cell engineering, the use of in vitro methods in plant breeding, genomics basis, the methodology of genetic engineering, transgenic plants, agricultural DNA technology, teaching the basics of production and use of transgenic animals genetic therapy, biotechnology components of food, enzyme technology, engineering enzymology, industrial biotechnology, environmental issues safety of biotechnology are studied in the discipline.

**Genetics.** We study heredity and variability of living organisms. The laws of heredity and variation are valid for all organisms and determine the development of life, because genetics is the theoretical basis for all disciplines, which have as their object living organisms. Heredity and variation is studied on the molecular, cellular and population levels.

**Biotechnological processes and equipment manufacturing.** The purpose of discipline is mastering the principles of biotechnological processes, technologies and facilities that provide them, and how to determine the basic parameters of raw materials and product biotechnological process.

**Electrical engineering and electronics basics.** Learning the basics of electrical engineering, which are necessary for in-depth study of electric drives and controls workflow in biotechnology in agriculture.

**Automation biotech industries.** The purpose of teaching the preparation of biotechnologists is mastering the theory and practice in the application of methods of complex systems of biotechnology by new technology and finding the best option performance.

**Regulatory support biotech industries.** The principles and methods of technical regulation and its components: standardization, conformity assessment, metrology, requirements for EN, TR, GATS and their place in the world of modern regulations, the requirements of the Directives mandatory for the European market requirements for safety and quality certified quality system of manufacturers, quality indicators to measure them using all methods of measurement metrology studies, the definition of products in low concentrations GMO, ways and problems of harmonization of Ukrainian system of standardization and certification in the field of biotechnology with international rules and regulations are studied in the discipline.

**Fundamentals of designing.** The development of students' design methods biotech equipment, mastering the necessary techniques development and introduction of new bioprocess. The basis of biotechnological processes, equipment and tools to perform basic process operations, the theoretical basis for calculation of parameters of machines and their working groups are covered in the discipline.

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**Instrumental methods of analysis.** We study the basic theoretical principles underlying physical, chemical and visual instrumental systematic study of biological objects in vitro and in vivo learns the basic techniques of electrophoresis, chromatography, colorimetry and spectrophotometry, the technique works on light, fluorescent, confocal and electron microscopes that is necessary for the formation of highly qualified specialists in the field of biotechnology and ecology.

**Computer technology and programming fundamentals.** We study the basic concepts and definitions database rules for their design, development methods tables, forms, reports, queries, templates, dynamic forms for data entry. Students are introduced to modern methods of data analysis, computational algorithms data, create a program for the implementation of computational algorithms.

**Radiobiology and radiocology.** The course considers the principles of agricultural radiobiology and radioecology; it introduces into the problems of biological impacts of ionizing irradiation, radionuclide migration in the environment and in the agricultural objects, the basic concepts of the radio ecological and dissymmetric monitoring; it presents the structure of the radiation control system, the methods of assessment and normalization of the doses and permissible levels of the radioactive contamination in accordance with the norms of radiation safety of Ukraine; it analyzes in details the countermeasures for reduction of the radio nuclides transfer into agricultural production and foodstuffs, as well as the ways for the ionizing irradiation application in the agricultural practice.

**Basic of biodiversity.**We consider the current methodology for the analysis of sustainable development and ecosystem functioning. The main goal of the course is mastering the methodology of quantitative and qualitative assessment of biodiversity, master techniques of modern analysis of ecosystems, which are basic in the study of population and interpopulation relationships, the main provisions of modern ecology and biology, the evolution of living organisms in the biosphere, environmental problems of today and how their solution.

**Proteomics and genomics.**The acquisition of theoretical foundations and formation of appropriate skills in the study of viruses and their spread in agrocenoses. Special of the discipline makes it possible to learn basic techniques in working with virological material, identify the virus by biological testing, electron microscopy, immunoassay methods and obtain virus-free planting material by microclonal reproduction is necessary for the formation of highly skilled agriculture.

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

**Plant physiology.** We study basic physiological processes in plants, physiology and biochemistry of plant cell, plant water exchange, photosynthesis, respiration, mineral plant nutrition, growth and development of plants and plant resistance to adverse conditions.

**Industrial Biotechnology.** Study the physiological characteristics of industrial strains, culture media preparation technology for various industrial strains of microorganisms, methods of cultivation, management of industrial strains growing and getting their products from microbial synthesis templates and key stage biotech industries, methods of cultivation producers, operating principles and design bioreactors, directions of substances of primary and secondary metabolism, control methods for the biosynthesis of products based on microorganisms.

**Applied Ecology.** Students acquire skills to: environmental assessment landscape, identifying environmentally safe ways of objects of the economy, including biotechnology industries; forecasting of emergency situations and making appropriate decisions for the stability of the functioning of the economy, and protection of personnel from possible

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consequences of accidents, natural disasters, modern destruction and during liquidation of consequences.

**Bioengineering.** Cell culture of higher plants, the main types of bioprocess, biotechnology receiving primary, secondary metabolites, the basic principles of industrial implementation of biotechnological processes, circuits fermentation processes, bioreactors, immobilized enzymes and proteins, enzymes technology, technology, monoclonal antibodies, enzyme immunoassay, biosensors the basic directions and objectives of modern bioengineering, molecular basis of bioengineering, molecular organization of genomes, obtaining individual gene vectors for genetic engineering, expression of cloned genes, genetic engineering of plants, animals, gene therapy, biotechnology and biosafety are studied in the discipline.

**Introduction to profession.** As a discipline taught the basic principles and theoretical foundations of biotechnological approaches for culturing cells and tissues under in vitro in plant, medicine, pharmacology and other sectors of the economy, the theoretical and practical aspects of industrial biotechnology ecobiotechnology, genetically engineered immune biotechnology, biotechnology fuels, which contributes to better perception of current biotechnological developments, targeting areas in modern biotechnology.

**Immunogenetics.** We study the basic concepts and theoretical foundations of current regulations and laws immunogenetics, the formation of humeral and cellular immunity and its role in the development of several pathological processes, teaching methods, approaches and application development used in modern practice based on the use of components of the immune response and given the specificity of the interaction of antibodies with different substances that have antigenic determinants.

**Molecular biotechnology.** The structure of nucleic acids, DNA replication, replicon in eukaryotes, local amplification of DNA, replication errors, transcription in prokaryotes, promoters in eukaryotes, chromatin, the processing of RNA, reverse transcription, DNA repair, recombination, gene conversion, recombination specific, mobile elements of the genome, the general scheme of protein synthesis, the discovery of RNA transport, ribosomal proteins, translation initiation, elongation, regulation of translation in prokaryotes, regulation of translation in eukaryotes are studied in the discipline

**Biotechnology microbial synthesis of drugs.** The course provides a system of knowledge about technology and the use of antibiotics, enzymes, vitamins and genetically engineered protein drugs. Shows the current understanding of the biological role of antibiotics, especially the biosynthesis of antibiotics by different groups of producers, biological bases of fermentation to produce antibiotics and general principles of technology of production, mechanisms of action and practical use. Explored technological features culturing microorganisms to produce enzymes, methods of isolation and purification of enzymes, production technology proteolytic, amylolytic, lipolytic and other enzymes, modern methods of immobilization of enzymes and their practical use. Students will become familiar with modern technology getting some vitamins microbial synthesis, recombinant proteins, methods of isolation and purification.

**Biotechnology of production of microbial products for agriculture.** The course provides knowledge of the system to prevent the negative effects of chemicals by using elements of biological agriculture-based mineral plant-microbe interactions, in particular - the technology of microbial preparations from phosphatemobilizing and nitrogen-fixing bacteria, germs, pathogens antagonists that regulate the power on crops, raise their productivity and resistance to diseases. Microbial preparations to improve their production technology - is an important element of modern ecologically safe technologies for growing high-quality agricultural products does not lead to a deterioration of the environment and saves material resources sector. These students' knowledge on the use of new technologies microbial products for agriculture will be one of the solutions to environmental problems of agriculture in Ukraine.

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**Ecological biotechnology.** The course deals with the discipline of modern methods of biotechnology to solve environmental problems that uses biological systems, living organisms and their metabolic products. Methods of cleaning the environment from man-made pollution, restore soil fertility, replacing chemicals, receive and environmentally optimized polymer modification and prevention biocorrosion, biodeterioration and biofouling, study methodological approaches to major destinations provide effective cleaner processes production, switching to closed loop water, anti-corrosion and microbiological biodeterioration of materials, plant biosecurity and the creation of new effective biocides are discussed in the course of discipline "Ecobiotechnology".

**Objects of biotechnological production.** Attention during the course of teaching is focused on the biochemical transformation of substrates into products for which the purpose of the biotechnology is sought. The course consists of two content modules. The first module is devoted to acquainting with the diversity of producers of target substances and peculiarities of their use, as well as to the value of each group of these organisms. The tasks of the second content module are the study of the lawfulness of the occurrence of elementary chemical and biological processes used in biotechnological research, as well as familiarization with the methods of rational provision and the use of assimilation and distillation processes for the receipt of target substances.

### ***Optional Block 2 (Student's Choice)***

#### ***Optional Block 2.1 «Environmental biotechnology»***

**Environmental Toxicology.** Exploring sources of ecotoxins and their behavior in abiotic components of ecosystems, bioavailability, metabolism and bioaccumulation in living organisms, toxic effects of ecotoxins and products of their transformation on the ecosystem. Study of Environmental Toxicology, is to capture the essence of theoretical knowledge about the science of poisons, as well as practical skills of action and means of preventing adverse effects of toxicants on ecosystems and humans.

**Bioenergy systems in agrarian production.** The course " is considered to be all possible sources of energy derived from fossil as well as alternative sources. Considers energy, environmental and economic performance of energy is considered. The course may be controversy about the applicability of the considered fuels as energy sources for the purposes of Ukraine.

**Technology of bioproduction.** Purpose of the discipline is to consider using technology Bioproduction agricultural and industrial production, given the urgent needs of agricultural production and new promising developments of agrobiotechnology, the formation of students' theoretical and practical knowledge to ensure the implementation and operation of Bioproduction technology in real working conditions of agricultural enterprises and regional bio-laboratories.

**Fundamentals of plant biotechnology.** The purpose of this course is mastering the theoretical foundations and the formation of appropriate skills. Special of the discipline makes it possible to learn the basic techniques and skills with the culture of plants in vitro, a transgenic plant or plant resistant to herbicides, diseases, adverse environmental conditions, it is necessary for the formation of highly skilled agriculture.

**Bioconversion of waste.** The subject examines the transformation of organic material such as plant or animal waste, into usable products or energy sources by biological processes or agents, such as microorganisms. The program includes theoretical concepts ecobiotechnology (physic-chemical and biological recycling processes) and biotechnological methods for processing agricultural waste (biomass composition, wastewater treatment and solid waste, energy production, etc.)

**Optional Block 2.2 «Agricultural biotechnology»**

**Environmental safety in agriculture.** Discipline course examines issues of food security through the introduction of sustainable agricultural practices, improved quality of products and raw materials, ways to improve the processes of industrial processing of raw materials, promote the implementation of sustainable methods of afforestation, reforestation and decontamination of hazardous waste, how to preserve biological (in t.ch . genetic) resources to ensure sustainable development of the biosphere, the development of environmental emergencies and implement appropriate solutions to ensure the stability of the functioning of the economy, and protection of personnel against possible consequences of accidents, natural disasters, modern means of destruction and during liquidation of consequences.

**Terrestrial ecosystems and biomonitoring methods.** Generates specific knowledge about the diversity of terrestrial ecosystems at various levels of the organization, diversity and similarity of functional relationships in ecosystems on different continents, and introduces the typical forms of anthropogenic transformation of terrestrial ecosystems and the possibility of using biomonitoring methods for their study and environmental control. Future specialists acquire basic theoretical principles and practical skills on the structure and functioning biocenotic land cover on Earth, which is the main habitat of man. In general, the course includes three sections: general understanding of terrestrial ecosystems and their components, natural terrestrial ecosystems in the world (major biomes of the world) and ecosystem Ukraine and biomonitoring methods in the study of man-land ecosystems.

**Agricultural biotechnology.** The purpose of discipline is to familiarize students with the principles of the use of biological knowledge in agricultural production and use agrobiotechnological methods in various fields of agriculture.

**Biomethods of protection of products.** Familiarizing students with the issues of biological protection of crops from pests and based on this knowledge alone implement bio security, integrated systems of protection of crops and fruit trees in production under different forms of management based on species composition of harmful and useful fauna and flora, agro-climatic conditions area, and so on.

**Biotechnological processes agricultural technologies.** Exploring one of the priority areas of biotechnology, what covers both basic research and applied studies of the use of living organisms or other biological agents for sustainability and quality of agroecosystems. Development of new technologies, plant growth regulators, microbial plant protection from diseases and pests, bacterial fertilizers.

**Bachelor  
field of knowledge “Natural Sciences”  
in specialty “ECOLOGY”  
Educational-professional Program “Ecology”**

Form of Training:	Licensed number of persons:
- full-time	75
- part-time	75
Term of studying	4 years
Credits	240 ECTS
Language of tuition	Ukrainian, English
Qualification after graduation	Bachelor of Ecology

**The concept of training**

Preparation concept is to develop future ecologists' professional knowledge, hand-on experience, skills, proficiency and ecological competence, environment protection (according to types of economic activity) and balanced nature management (by types of land, water, forest use also usage of flora and fauna), which are ready for practical, professional-oriented and environment protection activity in Education, Science and Culture.

**Practical training**

Specialists handling competence takes place at research-and-development farms Separated subdivision of NULES of Ukraine “Velykosnytynske Education and Research Farm named after O.Muzychenko”, “Agronomic Research Station” and Institute of Agroecology and Nature Management of National Academy of Agrarian Sciences of Ukraine, Institute of Plant Protection of National Academy of Agrarian Sciences of Ukraine, “Svitanok-agrosvit” LLC, Ukrainian State Science and Research Institute “Resurs”, Scientific and Productive company “Agroecosystema LTD” LLC.

**Proposed Topics for Bachelor theses**

1. Environmental Assessment of crop production technology.
2. Environmental analyses of hydrologic systems function compatibility.
3. Health-related monitoring and ecological certification of safe water-source supply.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

Work placements are branch enterprises (agricultural, recycling, nature protection oriented organizations, ecological and naturalist centers, scientific laboratories of ecological monitoring, inspections, certification) at different professional environments.

**Bachelors Program and Curriculum  
in Specialty "Ecology"  
Educational-professional Program "«Ecology»"**

<b>Code n/a</b>	<b>Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)</b>	<b>Amount of credits ECTS</b>	<b>The final control</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Ukrainian for professional purposes	3	exam
CC 2	Foreign language (English, German, French, Spanish)	8	exam
CC 3	Philosophy	3	exam
CC 4	Mathematical physics	8	exam
CC 5	Informatics and Systematology	3	exam
CC 6	Geology with Fundamentals of Geomorphology	3	exam
CC 7	Hydrology	3	exam
CC 8	Introduction to Specialty	3	exam
CC 9	Wildness protection	3	exam
CC 10	General Ecology (neoecology)	6	exam
CC 11	Labour and life safety	3	exam
CC 12	Biology	6	exam
CC 13	Landscape Ecology	3	exam
CC 14	Environmental legislation and environmental law	4	exam
CC 15	Techno ecology	4	exam
CC 16	Ecological Compliance	4	exam
CC 17	Human Ecology	3	exam
CC 18	Environmental monitoring	6	exam
CC 19	Regulatory Actions Anthropogenic Load upon Environment	5	exam
CC 20	Ecology of Urban Systems	4	exam
CC 21	Modeling and Environment State Forecasting	8	exam
CC 22	Environmental Assessment	3	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Fundamentals of environmental education and culture	3	exam
OB 1.2	Ethnocultural	2	exam
OB 1.3	History of Ukrainian Statehood	3	exam
OB 1.4	Chemistry (inorganic and bioorganic)	15	exam
OB 1.5	Chemistry (organic and bioorganic, physical and colloidal)		exam
OB 1.6	Chemistry (analytical)		exam
OB 1.7	Scientific Activities Fundamentals	3	exam
<b>The volume of components of the general training cycle</b>		<b>119</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 23	Economics of Nature Management	3	exam
CC 24	Chemistry and Fundamentals of Biochemistry	5	exam
CC 25	Meteorology and Climatology	3	exam
CC 26	International environmental policy	4	exam
CC 27	Organization and management in environmental activities	6	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.9	Ecology of Biological Systems	5	exam
OB 1.10	Environmental Protection	4	exam
OB 1.11	Sustainable Nature Management:	6	exam
OB 1.12	Agro ecology	5	exam
OB 1.13	Ecotoxicology	4	exam
OB 1.14	Environmental Biotechnology	3	exam
OB 1.15	Agricultural Products Quality Management	2	exam
OB 1.16	Radiobiology and Radioecology	3	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 1.17	Topographies with Cartography Fundamentals	6	exam
OB 1.18	Environmental Standardization and Certification	3	exam
OB 1.19	Physical training	6	exam
OB 1.20	Psychology and pedagogy	4	exam
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1 «Ecological Agricultural sphere»</b>			
OB 2.1.1	Environmental Protection Agricultural Ecosystem	5	exam
OB 2.1.2	Ecological Farming	4	exam
OB 2.1.3	Land Improvement	3	exam
OB 2.1.4	Agricultural Chemistry	6	exam
<b>Optional Block 2.2 «Ecological problems of rural agglomerations»</b>			
OB 2.2.1	Recreational potential of agrolandscapes of Ukraine	7	exam
OB 2.2.2	Balanced development of rural areas	8	exam
OB 2.2.3	Social Ecology	8	exam
OB 2.2.4	Ecological safety of residential and industrial areas	6	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>104</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
1	Military training course	29	
2	Academic Practice	10	
3	Production Practice	4	
4	Bachelor Thesis writing (Graduate thesis or Project)	2	
5	State Attestation	1	
6	Total for Specialty (without Military training course)	17	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Mathematical physics.** Provides forming of knowledge from fundamental sections of Higher Mathematics that corresponds students' professional preparation program: definitions, theorems, rules, forming of initial skills, self directed learning of math's literature and other informational sources, solution to equation of simple algebraic equations, applying of integral calculus; solution of differential and difference equations and their systems; investigating of nearly poised series upon the sum total and using of nearly poised series for approximation computation, and analysis of different environmental processes. Forms knowledge about processes that take place at biological systems and are life foundation and activities of wild-life, fundamental principles of physics which underlie life and activities of agricultural plants, synergies between plants and environment, physical factors influence over seed grains, plants and environment for increasing crop-producing.

**Informatics and Systematology.** Forms knowledge about methods, typical target settings and formalization for processing and databases maintenance, principles of their solvation by computerized tools, conceptual frameworks structural principle electronic document flow system; proficiency to choose technological schema appliance of system-wide and specialized packages of application programs and using them for handling of applied ecological, environment protection problems and sustainable nature management.



**Hydrology.** Generates knowledge of the hydrological regime of water bodies, environmental problems of water resources, ecological and methodological foundations of hydromorphological analysis of aquatic ecosystems, skills and abilities to determine the conditions of biota effects on aquatic ecosystems of natural and anthropogenic factors, impacts on water ecosystems.

**Geology with geomorphology basics.** Generates knowledge about the structure of typing and classification of landforms and geomorphological zoning areas, interconnections and the relationship between geological structures and morphology of the terrain, the ability to establish relationships of soil factors, to determine the erosion processes in different soil-climatic and geomorphological conditions, assess erosion control measures and their role in improving the environment.

**Introduction to speciality.** 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.

**Wildness protection.** Provides formation of knowledge and skills of complex of organizational, legal, scientific, economic, and educational activities designed to preserve the unique and typical landscapes or specific natural objects of scientific, environmental purposes.

**General Ecology.** After taking over the course students are gaining knowledge about fundamental ideas of Ecological Science: doctrine about biosphere and ecosystems, sources and flaws of energy issues in ecosystems, influence pattern of ecological factors, biotic relation between bionts, species and populations; skills to define natural-resources potential of ecosystem and socioeconomic analyses of their macroeconomic activity.

**Biology.** As a result of studying the course students gain knowledge of the impact of economic activities on natural habitats, the most common species of higher plants, plant communities and flora regions, methods and floral phytocenology research, abilities and skills of geobotany description of meadow, forest and anthropogenic plant communities, identifying plants of various types and indicators habitat and to identify reservations virus infections in agrocenoses.

**Landscape Ecology.** The discipline ensures the acquisition of knowledge from learning the basic landscape types, namely the overall structure and the basic principles of their formation, their properties, studying the influence of different activities on landscape and the specifics of transformations as a result of anthropogenic factors. During training, students acquire skills to provide general characteristics of condition of landscapes to determine their environmental sustainability, and develop activities to prevent and stop the degradation phenomena, using the latest technologies and approaches.

**Environmental Legislation and Environmental Law .** Provides a study of current environmental legislation and environmental and legal issues facing the science of environmental law, the study of current natural resource legislation, the main problems related to land use, water use, mineral resources, forest management, using air, flora and fauna, the study of current natural resource legislation, the main problems related to the protection of land, water, minerals, forests, air, protection of flora and fauna

**Techno Ecology.** The discipline provides the formation of knowledge and skills to assess the possibility and effectiveness of using alternative energy sources on the basis of ecological and economic analysis of manufacturing processes, to evaluate the features of technogenic pollution of geosphere.

**Ecological Compliance.** Generates knowledge on fundamental and applied aspects of ecological safety of environment and skills for using techniques and methodologies to assess the environmental impact, the risks of disasters, processing, analyzing, organizing and summarizing information on environmental safety.

**Human Ecology.** Provides knowledge about patterns of human interaction with the environment, its impact on the preservation of health, adaptation of the human body to technological changes in the environment, the ability to use mapping, mathematical, statistical, social and hygienic methods of monitoring and control in the field of human ecology, to apply methodology for determining environmental Chronobiology aspects for the study of biological rhythms and their adaptive role in anthropogenic ecosystems.

**Environmental Monitoring.** Generates knowledge about the system of state environmental monitoring, monitoring of air, groundwater of agrosphere, soil and environmental monitoring, monitoring of phytosanitary pests in agrocenoses, skills and abilities of environmental-monitoring reclamation of irrigated and drained lands, to determine the extent of disease assessment.

**Regulatory Actions Anthropogenic Load upon Environmental.** Provides acquisition of knowledge about general characteristics of the problem of anthropogenic impact and the rationale for its regulation, the main types of anthropogenic pressures and those human activities that can cause them, the theoretical aspects of scientific substantiation standards of influence of factors of physical, chemical and biological nature, charts of rationale of regulations and the possibility of their use in practice.

**Ecology of urban systems.** Specifies knowledge about the basics of spatial modeling of urban systems, principles and approaches to the classification of natural and anthropogenic landscapes, the characteristics of living organisms, their populations and groups in the urban environment, creates acquiring of skills concerned about urban environment, the city as a specific human environment and biota, urbangeosociosystem, landscape regarding the explanation of the environmental, socio-cultural and technological problems of cities.

**Modeling and Environment State Forecasting.** Provides knowledge of mathematical modeling of the environment condition and the basic laws of distribution of pollutants from the source of emission, the food chain to humans, the basic laws of distribution of pollutants in the environment, their impact on the ecosystem components, the ability to estimate radiation doses on humans, as well as patterns of dynamics of populations of living organisms and their impact on the environment.

**Environmental Assessment** Provides knowledge about the normative and legislative basis of ecological-expert activity, general requirements for carrying out ecological examination, peculiarities of conducting geocological 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 geocological expertise; students acquire the skills: to conduct an ecological examination of technologies, raw materials and products.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines “History of Ukrainian Statehood”, “Ethnocultural”, “Philosophy”, “Ukrainian for Professional Purposes”, “Foreign Language (English, German, French, Spanish)”, “Physical Training”, “Labour and Life Safety”, “Legal Personal Culture” see Section 2.1.

**Fundamentals of environmental education and culture** Form knowledge on the main directions of human resource development, stages of environmental development and the consequences of this development, human-induced ecological disasters and ways of their solution, optimal and perspective methods of ecological education and culture in the current conditions of state development, main dimensions of ecological culture, main approaches development of ecological culture and consciousness of the general population, legislative and legal maintenance of rational nature use. Be able to: use the acquired knowledge in practice, distinguish between environmental problems of anthropogenic and natural origin, develop a concept for the development of environmental education at an enterprise or in an educational institution, in the region.

**Chemistry (inorganic and bioorganic).** The program includes theoretical positions of modern inorganic chemistry and peculiarities of chemistry of biogenic elements, such as Hydrogen, Halogens, Oxygen, Sulfur, Nitrogen, Fluor, Carbon, metals. Chemical processes involving these elements and their compounds are considered from the standpoint of electrolytic dissociation, hydrolysis, ocean-bearing processes and the possibility of formation of complex compounds. The main classes of inorganic compounds are considered: oxides, hydroxides, acids, salts.

**Chemistry (organic and bioorganic, physical and colloidal).** During the study of organic chemistry, the nomenclature, finding in nature, the role in the living organism, structure, laboratory and industrial methods of obtaining, chemical properties of the basic classes of organic compounds: alkanes, alkenes, alkadienes, alkenes, cycloalkanes, aromatic compounds, terpenes, and also halogen derivatives are considered. , alcohols, phenols, aldehydes and ketones, carboxylic acids and their esters, anhydrides and halogens, amines and amides, carbohydrates, amino acids and proteins, nucleic acids. During the study of physical and colloidal chemistry, issues of thermodynamics, thermochemistry, solution theory, chemical kinetics and catalysis are considered, the main provisions related to the highly dispersed state of matter, surface phenomena and adsorption.

**Chemistry (analytical).** Includes the basics of qualitative and quantitative chemical analysis. Quantitative methods of gravimetry, acid-base titration, redoximetry, complexometry are considered.

**Scientific Activities Fundamentals.** Provides learning of search method, storage and processing of scientific information, methodology and methods of theoretical research, the structure and technology of the experiment, using modern sources of scientific information; skills using simulation and mathematical analysis of the object of research, plan and analyze the results of the experiment.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Economics of Nature Management.** Provides the formation of students' environmental and economic outlook and provide them with relevant knowledge which will allow future professionals not only determine the level of environmental pollution, the value of damage caused by him, but also conduct effective targeted work on its protection and restoration.

**Chemistry of the basics of biogeochemistry.** Provides formation of knowledge of biogeochemical aspects of the biosphere and principles of operation, types of migration, biological cycle and biogeochemical cycles of living matter; abilities to apply methods of biological indication for environmental biogeochemical zoning predict measures to obtain high-quality environmentally friendly agricultural products, analyze situation of biogeochemical endemic regions, to develop recommendations for optimization of

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anthropogenic landscapes in order to minimize the negative impact of human activity and maintaining a balance between ecosystem components.

**Meteorology and Climatology.** Generates knowledge about basic meteorological factors, structure, properties and physical processes, meteorological phenomena and mechanisms, ensures the acquisition of skills to assess synoptic weather, meteorological factors influencing agrosphere, using meteorological observations for integrated environmental analysis of the environment condition and making weighted environmental solutions.

**International environmental policy** Studying the system of international ecological prology, ecological concepts, principles, approaches, priorities and directions of activity, documented and officially declared (approved), and which determines the relationship between society, the state and the environment, forms the knowledge and skills of future managers in the development of environmental policy , systems of production, management of enterprises, corporations taking into account international experience, through which demonstrates the tendency of management to environmental priorities .

**Organization and management in environmental activities** The subject of studying the discipline is the system of economic, economic, legal, financial relations in the field of provision of environmental protection activities at enterprises of Ukraine, substantiation of the mechanism of planning, control and efficient management of modern environmental projects. The purpose of the discipline is the formation of future specialists in contemporary system thinking and a set of special skills and abilities of the use of a universal tool for environmental project management. The main tasks of studying the discipline are to provide a scientific and methodological basis for students to master the specialty 101 "Ecology" of the main instruments of management of environmental projects of the organization: familiarization with the stages and procedures of the formation of environmental projects, organizational, personnel, resource, financial and information and legal provision of environmental projects, definition economic, financial and social expediency of their implementation at macro and macro levels.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

**Ecology of biological systems.** Provides knowledge of the morphology and physiology of the major groups of microorganisms, their role in the transformation of organic matter in soil processes and increase soil fertility, the role of microorganisms in the synthesis of humus and formation of soil structure, the impact of farming on microbiological processes. Students acquire skills to determine the status of populations of organisms, identify species, measure the number and status of populations, to develop ways to prevent and suppress viral infections.

**Environmental protection.** Provides acquisition of knowledge and professional abilities and skills of basic and applied ecology, environmental protection (in various industries) skills to solve environmental challenges by selecting the application of environmental scientific research and expert control methods of environmental forecasting, of the environment condition design, environmental control, monitoring, certification, auditing, assessment and inspection of various components of the environment, predict, prevent and eliminate environmental risks and hazards at local, regional, national and global levels.

**Sustainable nature management.** Generates knowledge of the socio-economic, environmental and safety, institutional balance of nature by type of land, water, forest management and use of flora and fauna, the concept of ecological safety of agricultural domain. Students acquire the abilities and skills of a systematic approach to identifying and managing the quality of natural resources, development and implementation, assessment of resource and energy-saving agricultural technologies.

**Agroecology.** Provides acquisition of knowledge about the impact of environmental factors on productivity of crops, the structure and dynamics of communities of organisms that live in agroecosystems, the basic laws of agroecology, agroecosystems performance and ways to improve it. Acquire abilities and skills to determine the types of agro-ecosystems and their functioning, ways of greening the various agricultural facilities, and make use of agri-environmental maps and models.

**Ecotoxicology.** The discipline is focused on the theoretical concepts and knowledge about the impact of exogenous toxicants on living organisms, their reaction to the performance of hazardous chemicals, the mechanisms of adaptation of organisms to the action of xenobiotics and counteract them, skills to master the scientific principles of hazard assessment of chemicals on living organisms and prediction of adverse effects this effect.

**Environmental biotechnology.** Generates knowledge about biotransformation, biodegradation and bioavailability of the major biochemical pathways of microbiological transformation of organic xenobiotics, genetic basis for the creation of recombinant microorganisms, skills and abilities for the biological removal of heavy metals and radionuclides, making phytoremediation, biological purification and deodorization gas-emission of microbial processing of organic waste.

**Agricultural Products Quality Management.** Provides acquirement of learning the basics of technological methods that form the parameters of quality of crop production, formation of skills for monitoring and use of chemicals in manufacturing processes get crop production, conservation and improvement of soil fertility, including natural conditions, market production, the use of agrochemicals in order to optimize feed crops , increased productivity and a high quality crop production.

**Radiobiology and Radioecology.** Examines the concept and migration of radioactive substances in the agricultural production and the effect of ionizing radiation on phytocoenosis and zoocenosis within agroecosystem. Forms skills and abilities to develop ways of contamination of the environment, ways and means of decontamination of food raw materials, the study of the biological effects of ionizing radiation on plants and animals.

**Topography with the basics of cartography.** Provides formation of knowledge on significant spatial model, the mathematical basis for maps, coordinate system topography and cartography, modern methods of targeting areas methods of acceptance and use of topographic maps and plans for environmental monitoring. Students acquire skills to conduct topographically-geodetic measurements, mapping modeling and forecasting.

**Psychology and pedagogy** Forms students knowledge of research methods of psychology and pedagogy, patterns of the course of individual psychic phenomena and their interrelations, typology and style of individual management activities; skills and abilities to find the right ways to get out of conflict situations, identify and select the right leadership style of the team.

**Optional Block 2 (Student's Choice)****Optional Block 2.1 «Ecology of agrosphere»**

**Ecological Protection of agroecosystems.** Generates knowledge about the structure and functioning of agricultural ecosystems, methods for optimizing agricultural landscapes, forecasts of crop diseases in agrocenoses, the ability to identify and take records of pests and diseases, to predict their development, optimizing agricultural landscapes based on contour reclamation of agricultural areas.

**Ecological farming** Involves the study of the specificity of formation and functioning of agroecosystems, key anthropogenic factors that affect the environmental sustainability of agro-landscapes, their performance and ways to improve the ecological basis of the principles of ecological basic technological units receiving agricultural products and raw materials. To be able to develop projects of rotation for a particular sector, their development plans, identify common weed species in Ukraine, which vegetate and seed germination make predictions weeds and develop a system of integrated resource-saving protection against them.

**Land Improvement** Provides knowledge on the patterns of placement and development of various activities aimed at radically improving the natural environment; skills and habits of environmental assessment of methods and techniques of land reclamation, determination of expediency and efficiency of reclamation and their complexes in different natural zones, forecasting the development of land reclamation complexes in the territorial and temporal aspects.

**Agrochemistry.** Involves the formation of knowledge about the basic tasks of chemicals as a basis of agriculture, agro-ecological assessment of mineral fertilizers and their impact on the environment and quality of crop production and technology, charts of and machines for application of organic and mineral fertilizers, agro-ecological potential changes in the environment during their violations.

**2.2. Disciplines offered by students****2.2.1. Specialization « Ecological problems of rural agglomerations »**

**Recreational potential of agrolandscapes of Ukraine.** Generates knowledge about the functioning of agro-ecosystems, the role of natural biodiversity in agricultural landscapes stability, structure of agricultural landscapes and ecological sustainability; ability to identify natural resource potential of agricultural landscapes to build statistical models and mapping agro-ecosystems, explore their development by means of modern information systems.

**Balanced development of rural areas.** Generates knowledge of the characteristics of the current state of rural areas and the dynamics of rural settlements priorities of their revival, the basic principles of institutional support for development of rural areas of the country with the European practice. Skills in the field of rural development, reproduction and quality of human resources, improve the efficiency of the rural economy, rational use and restoration of natural resources.

**Social Ecology.** Generates knowledge of the characteristics of social ecology as a science, the concept of eco-oriented social development, ecological goals-oriented activities, the main aspects that determine the ecological imperative in the overall management of socio-economic development, basic laws and patterns of interaction between society and the environment. Skills to research the development of modern social and technological processes, their relationships and characteristics and program development of ecologically safe development.

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**Ecological safety of residential and industrial areas.** Forms of knowledge of the natural reserve fund with the involvement of territorial communities of villages, settlements and businesses, control and responsibility for the discharge of domestic waste, organizing spontaneous dumps, polluted water into surface water bodies in rural areas. Skills to create the conditions for integrated rural development in the public interest that provides competitive rational formation of diversified and versatile agriculture, diversified rural economy enabling environment based on the growth of human and social capital and development partnership between the state and business.

## 2.4. FACULTY LIVESTOCK SCIENCE AND WATER BIORESOURCES

**Dean – Vadim Kondratiuk**, Associated Professor, Candidate of Agricultural Science

Tel.: (044) 527-85-56 E-mail: vadkondratyk@ukr.net

Location: Building № 1, Room. 34

The faculty organizes and coordinates the educational process of bachelors in the following specialties:

### ***207 Water Bioresources and Aquiculture***

Educational-professional Program “**Water Bioresources and Aquiculture**”

Graduating departments:

Department of Aquaculture

Tel.: (044) 527-89-65 E-mail: aqua\_chair@twin.nauu.kiev.ua

Head of Department – Nadiya Vovk, Professor, Doctor of Agricultural Science,

Department of ichthyology and Hydrobiology

Tel.: (044) 527-86-83 E-mail: gidrobio@ukr.net

Head of Department – Petro Shevchenko, Associated Professor, Candidate of Biological Science.

### ***204 Technology of production and processing of livestock products***

Educational-professional Program “**Technology of production and processing of livestock products**”

Graduating departments:

Department of Breeding and Biotechnology of animals

Tel.: (044) 527-82-30 E-mail: rubansy@gmail.com

Head of Department – Sergey Ruban. Professor, Doctor of Agricultural Sciences, Corresponding Member of the National Academy of Agrarian Sciences

Department of Milk and Beef Production Technology

Tel.: (044) 527-83-93, (044) 527-82-32 E-mail: ugnivenko@i.ua

Head of Department – Anatoly Ugnivenko, Professor, Doctor of Agricultural Science

Professor P.D. Pshenichniy Department of Animal Nutrition and Feed Technology

Tel.: (044) 527-85-55 E-mail: feeding\_animals@ukr.net

Head of Department – Mikhail Sychev, Professor, Doctor of Agricultural Science

Department of Horse Breeding and Beekeeping

Tel.: (044) 527-82-68 E-mail: horse\_chair@twin.nauu.kiev.ua

Head of Department – Nicholay Povochnikov, Professor, Doctor of Agricultural Science

Department of Technology in poultry, pig and sheep farming

Tel.: (044) 527-87-60, 527-84-78, 527-88-49 E-mail: zasukha\_y\_u@ukr.net

Head of Department - Yuri Zasuha, Professor, Doctor of Agricultural Science.



**Bachelor**  
**in specialty “Water Bioresources and Aquiculture”**  
**field of knowledge "Agricultural science and food"**  
**Educational-professional Program**  
**"WATER BIORESOURCES AND AQUACULTURE"**

Form of Training:	Licensed number of persons:
– Full-time	75
– Part-time	75
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian, English
Qualification	Technologist of Aquaculture Production

**Concept of training**

Modern fish farming requires new technologies that professionals cannot implement without deep theoretical knowledge of such issues as water quality, ecological status of water bodies, value of hydrocole in functioning of aquatic ecosystems, knowledge of water bio-source potential and its sustainable use.

Development of new and improved fish breeding technologies in natural conditions and in industrial farms also require theoretical knowledge about potency of the species, their physiological and biochemical characteristics, processes of acclimatization and adaptation hydrocole undergo under impact of changing, aquatic environment, intensification of fish farming through the use of bio-active substances with the purpose of enhancing bio- and fish productivity of various ponds, preserving in them biodiversity and harvesting high-quality fish products.

In the course of this program, the students will be taught hydro-ecological disciplines: fish physiology, fish genetics, fish anatomy, aquatic chemistry, hydrochemistry, fish breeding and selection; professionally oriented disciplines: biological basis of fisheries, research methods in fish farming, aquarium basics, bioresources of hydrosphere and their use; fish processing technology and preparation technology: design of fish-breeding enterprises, aquaculture of natural ponds, aquaculture of artificial reservoirs, fisheries hydraulic engineering with the basics of geodesy, fishing farming and others.

By the end of their studies the experts on aquatic biological resources and aquaculture in process of their training acquire the strong fundamental and practical training in cold and warm water fish farming.

**Practical training**

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 "Ukryba", DG "Great Lubin", PJSC "Hmelnytskrybhosp", PE "Aquarium Technologies", PJSC "Sumyrybhosp", PJSC "Hersonrybhosp", JSC "Vilshanka", ARC "Kherson Fishermen", PJSC "Poltavarybhosp", Fishing Farm "Nyvka", IRG NAAS of Ukraine, JSC "Chernihivrybhosp", Astrakhan State Technical University (Astrakhan, Russia) and the Louis Pasteur National Lyceum (France) and others.

**Academic rights of Graduates:** graduates can apply for Master’s Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Upon successful completion of bachelor's degree course the specialist can perform professional work specified under the Classification of Occupations DK 003-2005, approved and put into effect by Resolution № 257 dated 27.07.1995 of State Committee of Ukraine for Standardization under the following classification groups and professional work titles: laboratory technician (biological research), laboratory technician assistant (biological research), fish culturist-technician, aquaculture technician, fish culturist-engineer, aquaculture process engineer, state fisheries inspector and may hold primary positions of a fish culturist, ichthyologist, hydrobiologist and state inspector.

**Bachelor`s Program and Curriculum  
in Specialty «Water Bioresources and Aquaculture»  
Educational-professional program «Water Bioresources and Aquaculture»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Hydrochemistry	8	exam
CC 2	Zoology	9	exam
CC 3	Ontogeny of fish	4	exam
CC 4	Fish anatomy	3	exam
CC 5	Hydroecology	7	exam
CC 6	Latin	3	exam
CC 7	Mathematical Methods in Biology	5	exam
CC 8	Biophysics aquatic	5	exam
<b>Optional components of EPP</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Foreign language	12	exam
OB 1.2	The history of Ukrainian statehood	3	exam
OB 1.3	Ethnoculturology	3	exam
OB 1.4	Ukrainian language for professionals	4	exam
OB 1.5	Physical education	4	credit
OB 1.6	Philosophy	4	exam
OB 1.7	Life and work safety	4	exam
OB 1.8	Personality's legal awareness	3	credit
<b>The volume of components of the general training cycle</b>		<b>81</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Introduction to core professional course	4	exam
CC 2	Hydrobiology	11	exam
CC 3	Ichthyology	8	exam
CC 4	Physiology and Biochemistry of fish	7	exam
CC 5	Fish genetics	4	exam
CC 6	Fishing	7	exam
CC 7	Ichthyopathology	7	exam
CC 8	Cultivation and breeding of fish	8	exam
CC 9	Hydroengineering and technical equipment in fish farming	9	exam
CC 10	Aquatic toxicology	4	exam
CC 11	Feeding of fish	6	exam
CC 12	Biological basis of fish farming	5	exam
CC 13	Aquaculture of natural reservoirs	9	exam
CC 14	Aquaculture of artificial reservoirs	9	exam
CC 15	Fish processing technology	4	exam
CC 16	Economics of fishery enterprises	4	exam
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1	Aquatic microbiology	4	exam
OB 2.1	Bioresources of hydrosphere and their protection	6	exam
OB 2.1	Research methodology in fish farming	4	exam
OB 2.1	Pedagogics	3	credit
OB 2.1	Aquarium study	4	exam
OB 2.1	Principals of livestock farming	4	credit
OB 2.1	Fishery laws	4	credit
<b>The volume of components of the special (professional) training cycle</b>		<b>135</b>	
<b>The total amount of optional components</b>			

3. OTHER TYPES OF TRAINING			
CC 1	<i>Military training course</i>	18	
CC 2	Academic Practice	16	
CC 3	Production Practice	8	
CC 4	State Attestation	1	
<b>THE TOTAL AMOUNT OFF EPP</b>		<b>90</b>	

## 1. GENERAL TRAINING CYCLE

### Compulsory components

**Hydrochemistry.** The discipline examines the chemical composition of natural waters and artificial water bodies; the cycle of chemical elements in water ponds; patterns of temporal and spatial changes in chemical composition of water under the influence of biotic and anthropogenic factors and chemical processes shaping the quality of water.

**Zoology.** The discipline focuses on morphology and anatomy of animals, their physiology and ecology, taxonomy and geographic distribution, location and role animals play in ecosystems and agrocenoses. It contains a fundamental base of knowledge about animals and is an applied discipline for ichthyologists, livestock experts and environment protection engineers.

**Ontogeny of fish.** There is a discipline of biology individual fish from the conception of a new body (fertilization of eggs) to its natural aging and death. Studies features spermatogenesis and oogenesis, fertilization, and embryonic postembryonic periods of fish of different species and taxonomic groups and theoretical basis of modern technologies in fish farming. The discipline covers the biology of a fish development starting from beginning of pregnancy (fertilization of eggs) to its natural aging and death. It studies the peculiarities of spermatogenesis and oogenesis, fertilization, embryonic postembryonic periods of fish of different species and systematic groups and theoretical basis of modern technologies in farm farming.

**Fish anatomy.** This is a morphological discipline that studies the structure of the fish body and is essential for training of ichthyologist/ fish breeder. The study of anatomy lays down foundations of knowledge about the body structure of fish in terms of species and age factors; the main objective of the discipline is to provide students with knowledge about structure and patterns of ichthyoid and fish body in the light of causality and species specificity.

**Latin.** The main objective of the course "Latin" is to teach students Latin terminology used in botany and zoology, open access to a free and conscious perception of biological nomenclature, which is an essential element in education of a full-fledged professional.

**Mathematical methods in biology.** The discipline introduces the students to the personal computer and teaches them to use it for solving problems associated with major disciplines. The discipline considers the structure of personal computers and operating systems; the basics of text and spreadsheet documents and statistical data analysis applications used to optimize them.

**Biophysics aquatic.** The discipline underlies general education and theoretical training of students. The course provides students with a wide knowledge of physics and biophysics fundamentals, studies the physical and physicochemical phenomena in biological objects, as well as fundamental processes forming the basis of wildlife.

The specifics of this course is determined by the need of studying the laws of physics that underlie any processes: physical characteristics and properties of the animal body (mechanical, thermal, electrical, magnetic, optical); effects produced on animals by a variety of external physical factors (light, sound, ultrasound, infrasound temperature, electric and magnetic fields, etc.), the ability of animals to perceive and respond to these factors.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines “History of Ukrainian Statehood”, “Ethnocultural”, “Philosophy”, “Ukrainian for Professional Purposes”, “Foreign Language (English, German, French, Spanish)”, “Physical Training”, “Labour and Life Safety”, “Legal Personal Culture” see Section 2.1.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

**Introduction to core professional course.** The discipline introduces students to the content of future professional work; prepares them to completely and thoroughly master the disciplines of science, professional and practical training cycles, as well as acquire knowledge and skills during their practical hands-on training. The discipline is harmoniously combined with other disciplines that make up the basis of theoretical and practical training, especially with hydrochemical, hydrobiological, ichthyological disciplines and their technological components.

**Hydrobiology.** The discipline examines population of various reservoirs, environmental factors and general patterns of their effect on living organisms; the general laws applicable to life of populations and biomes; formation of water quality and biological productivity in aquatic ecosystems.

**Ichthyology.** This is a basic discipline for ichthyologists, fish breeders who study the structure of ichthyoid and fish, their origin and place among chordate animals; some components of fish living environment and their propagation in continental waters and oceans.

**Physiology and Biochemistry of fish.** The discipline studies specifics of functional activity of all body systems in different fish species at cellular, sub-cellular, tissue, member and body levels, which allows assessing the physiological status of fish under normal conditions and exposed to natural and anthropogenic factors. Physiology of fish introduces students to mechanisms regulating physiological functions of all systems that provide interaction between fish body and the environment. This is a basic discipline that helps students to get acquainted with basic concepts on proteins, lipids, carbohydrates, minerals, vitamins, enzymes, hormones, their biological roles in the body; the discipline is of considerable practical importance. The discipline is an objective foundation for modern fish farming and related industries. Mastering knowledge of aquatic biochemistry allows specialists to understand different biotechnological processes in aquaculture products' production and processing.

**Fish genetics.** The discipline lays down basics of the science of heredity and variation. It plays a leading role in the study of many problems related to the essence of life and evolution. The discipline is a scientific basis for selection and breeding of plants, animals, fish, and microorganisms.

Genetics is necessary to understand the nature of fish immunity against pathogens and develop methods of genetic protection against them. The study of physical and chemical mutagens and their mechanisms is important for breeding work and genetic pollution of environment, protection of heredity in humans, animals and fish against harmful mutagenic action. Knowledge of the genetic information, ways of its implementation in ontogeny and the role of environment will help selecting conditions fostering most useful properties and higher productivity in fish.

**Fishing.** The discipline is aimed at educating skilled professionals whose work is related the protection, cultivation and use of aquatic facilities.

During the program, students will gain knowledge about the most common fishing gear, materials necessary for their production, catching gear, main types and design features of industrial ships.

**Ichthyopathology.** The discipline studies fish diseases of different nature; factors contributing to their occurrence; general pathology; epizootiology, parasitology and host defense mechanisms in fish; modern diagnostic techniques; basic veterinary and sanitary measures that are used in fish farming. Objective of the course is to teach students a creative, integrated approach by using acquired knowledge and taking into account the environmental situation when solving fish health problems in natural and artificial fish communities.

**Breeding and selection of fish.** The discipline is a combination of theoretical and practical knowledge about fish farming and breeding based on studies of contemporary breeding and selection; fish breeding; fish gene pool characteristics; study of the basic methods used to breed and rear replacement youngsters and make up breeding fish shoals; practical introduction to main fish breeding processes and methods.

**Hydroengineering and technical equipment in fish farming.** In the course of professional training of qualified specialists the best practices of modern domestic fishery enterprises is used; the students get familiarized themselves with the structure of fish farms, production facilities, design and construction of hydraulic structures providing water for process purposes. The discipline helps students acquire a theoretical base and practical skills in using qualified technological equipment of reproductive aquaculture systems; provides a general description of fish farming equipment; modes of operation; methods to calculate the amount of equipment required for specific production problems.

The objective of the discipline is to provide students with necessary knowledge about the design of hydraulic structures in fishery farms; designing, building and operating hydraulic structures; technical feasibility of fishery construction; current and capital repairs.

**Aquatic toxicology.** The discipline examines the sources and ways of toxic substances' entry into the water, their migration, transformation and accumulation in aquatic ecosystems; the impact of toxicants on aquatic activity at level of individual organisms, populations and ecosystems.

**Feeding of fish.** The discipline provides future professionals with the basic knowledge about energy conservation, science-based technologies, storage and use of fish feed for achieving high efficient fisheries under conditions of economic activity.

**Biological basis of fish farming.** The discipline is part of fish breeders' training and is meant to foster in students theoretical framework underlying the fish breeding processes considering environmental and biological characteristics of fish facilities, biological acclimatization, artificial reproduction of fish and intensification of fish-breeding.

**Aquaculture of natural reservoirs.** The discipline provides knowledge about technological requirements that apply to mixed-use reservoirs for fishery purposes, to methods of building ichthyofauna and fish breeding biotechnology in these reservoirs. Future aquaculture production technologists require knowledge of this discipline to be able to intensify fish farming in rivers, lakes and reservoirs; improve technologies of artificial

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reproduction of valuable, rare and endangered species, facilitate the processes of fish species' natural reproduction and preservation of biodiversity in aquatic ecosystems.

**Aquaculture of artificial reservoirs.** The discipline examines the organizational structure of pond and industrial fish farms, biological basis of comprehensive intensification in aquaculture designed to increase biological productivity and fish productivity of reservoirs; technologies of cultivation facilities; production of planting material and marketable fish in warm-water and cold-water ponds and industrial aquaculture, taking into account systems, forms and cycles of fisheries management.

**Fish processing technology.** The discipline learns a set of theoretical and practical knowledge about standardization of pond and ocean fish production and processing. The students acquire this knowledge by studying the current state of breeding, selection, pond fish farming and fish processing; properties of basic technological techniques: storing, freezing, drying, curing, smoking, canning and achieving qualitative indicators of semi-finished and finished fish products; methods for determining quality indicators.

**Economics of fishery enterprises.** The object of the study is the accounting system of Ukrainian fisheries. The discipline includes analysis of trends and issues in fish farms accounting. Particular attention is paid to methodological aspects and methods of fisheries recordkeeping, accounting regulations (standards), accounting policies, primary documents, registers, charts of accounts, conducting accounts in conjunction with industry characteristics, account classes, accounting of biological assets, cost accounting and calculation of aquaculture product prime costs, classification of production costs, accounting of fixed assets, accounting of leases, depreciation, inventories, accounting of current assets, accounting of cash funds, accounting of cash payments, long-term liabilities, accounting of labor costs and labor remuneration in fish farming industry, accounting of income and financial results in fish farms, off-balance sheet accounts, balance sheet items (assets, equity, liabilities), basic forms of financial statements (balance sheets, income statements).

### **Optional components**

#### ***Optional Block 2 (Student's Choice)***

**Aquatic microbiology.** The discipline examines the role microorganisms play in enhancing water quality of ponds and integrated industrial fish farms; aquatic feed and microbial bio indicators used in aquatic ecosystems to reduce pathogenic microflora pollution and assess their health status.

**Bioresources of hydrosphere and their protection.** The discipline studies the amount, structure and localization of biological resources in hydrosphere; the laws of their formation; the possibility and extent of their use and reproduction as well as possible ways of using aquatic resources for food, feed, medical, industrial and other purposes.

**Research methodology in fish farming.** The discipline examines methodology of planning, organizing and conducting various types of research to obtain new theoretical knowledge and put it to practice in fish farming. The discipline helps students grasp basic principles of selection and recruitment in aquaculture facilities; basic methods of staging scientific experiments in pond fish farms as well as processing, systematization and generalization methods of research results and their patenting; procedures of drafting research reports.

**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

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the success of the training, skills characterize the organization of educational and training process.

**Aquarium study.** It promotes the study of water as a living habitat of biological objects. Directions of use is research of biology, ecology, animals and plants, their reproduction, nutrition and behavior. Many species of aquatic organisms are objects of study of the impact of toxic chemical and biological substances from the environment.

**Fundamentals of animal husbandry.** The discipline helps students master the basics of anatomy, physiology, breeding, feeding and housing of farm animals; basic production processes in cattle, horse, pig, rabbit breeding, beekeeping and fish farming.

**Fishery laws.** The discipline studies biological resources of World ocean; the possibility and extent of their use and reproduction as well as possible ways of using aquatic resources for food, feed, medical, industrial and other purposes.



**Bachelor**  
**Field of knowledge "Agricultural science and food"**  
**in specialty "TECHNOLOGY OF PRODUCTION AND PROCESSING OF LIVESTOCK PRODUCTS"**  
**Educational-professional Program**  
**«Technology of production and processing of livestock products»**

Form of Training:	Licensed number of persons:
– Full-time	125
– Part-time	60
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian, English
Qualification	Livestock products production and processing technologist

### **Concept of training**

Animal production is an important sector of agriculture. Its level of development defines how well the market demand in high-calorie food such as meat, dairy products, eggs etc, is met. Animal production provides raw materials for the food and light industries (meat, milk, leather, wool, wax, feathers, etc.) as well as for production of some drugs and medicines. It is closely linked with crop farming, for which it supplies organic fertilizers. The structure of animal production includes cattle, pigs, poultry and sheep husbandry. Equally important are horse-, bee breeding, pond fish farming, sericulture, etc.

### **Practical training**

In training of future professionals the department closely interacts and cooperates with educational and research facilities of the University VP NUBiP of Ukraine "Agronomic Research Station", "O. Muzychenko Velykosnitynske NDH", "NDH Vorzel" and the number of Ukrainian front-edge agricultural enterprises.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Upon successful completion of the Bachelor level studies the specialists can choose to work either in University's educational and research farms or at agricultural enterprises of different ownership.

**Bachelor`s Program and Curriculum in Specialty  
«Technology of production and processing of livestock products»  
Educational-professional Program  
«Technology of production and processing of livestock products»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Zoology	5	exam
CC 2	Chemistry	5	exam
CC 3	Morphology of agricultural animals	8	exam
CC 4	Biochemistry in animal husbandry	9	exam
CC 5	Mechanization of production processes in animal husbandry	4	exam
<b>Optional components of EPP</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Foreign language	12	exam
OB 1.2	The history of Ukrainian statehood	3	exam
OB 1.3	Ethnoculturology	3	exam
OB 1.4	Ukrainian language for professionals	4	exam
OB 1.5	Physical education	4	credit
OB 1.6	Philosophy	4	exam
OB 1.7	Life and work safety	4	exam
<b>The volume of components of the general training cycle</b>		<b>65</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Introduction to core professional course	3	exam
CC 2	Physiology of agricultural animals	8	exam
CC 3	Genetics of animals	4	exam
CC 4	Animal nutrition and feed technology	11	exam
CC 5	Ecology in animal husbandry	3	credit
CC 6	Animal hygiene	8	exam
CC 7	Animal breeding	8	exam
CC 8	Technology of rabbit breeding and animal farming	4	exam
CC 9	Ecology in animal husbandry	3	credit
CC 10	Technology of poultry production	5	exam
CC 11	Technology of beekeeping	5	exam
CC 12	Technology of goats production	5	exam
CC 13	Technology of milk and beef production	7	exam
CC 14	Technology of pig production	8	exam
CC 15	Technology of sheep production	5	exam
CC 16	Horse husbandry	5	exam
CC 17	Technology of processing livestock products	4	exam
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1	Mathematical Methods in Biology	3	exam
OB 2.2	Biophysics in animal husbandry	4	exam
OB 2.3	Microbiology in animal husbandry	5	exam
OB 2.4	Forage production	4	exam
OB 2.5	Research methodology	5	exam
OB 2.6	Biotechnology in animal husbandry	8	exam
OB 2.7	Fishing	4	credit
OB 2.8	Principles of veterinary medicine	3	credit
OB 2.9	Meat stockbreeding	4	exam
OB 2.10	Legal regulation in livestock	3	credit

OB 2.11	Economics of animal	3	exam
OB 2.12	EU Directives and Standards in Animal Husbandry	3	credit
OB 2.13	Technology of slaughter products	3	credit
OB 2.14	Pedagogics	3	credit
<b>The volume of components of the special (professional) training cycle</b>		<b>151</b>	
<b>The total amount of optional components</b>			
<b>3. OTHER TYPES OF TRAINING</b>			
CC 1	<i>Military training course</i>	18	
CC 2	Academic Practice	16	
CC 3	Production Practice	8	
CC 4	State Attestation	1	
<b>THE TOTAL AMOUNT OFF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Zoology.** It is a fundamental base of knowledge about animals and considers the animal world from the simplest to the chordate animals. It studies morphology and anatomy of animals, their physiology and ecology, taxonomy and geographic distribution, the place and role of animals in ecosystems and agrocenoses. Special attention given to groups and species of animals which are the most important in practical terms for agriculture, representatives of the local fauna.

**Chemistry.** The discipline studies the basic laws of chemistry and chemical properties of nutrients and their most important compounds, characteristics of chemical processes that accompany the production and processing of animal products. Future specialists learn modern concepts of organic chemistry that allow them to understand the structure of the tissues of animals and chemical processes in living systems. The discipline biochemical processes in living organisms, and biochemical methods which are used to determine the biochemical parameters that characterize the physiological state of the body and the pathology.

**Morphology of agricultural animals.** This is a general biological discipline that studies the domestic animal and poultry anatomy, and is basic in preparation of the animal product production and processing technologists. After having studied the morphology of farm animals the students acquire the foundations of knowledge about domestic animal anatomy from perspective of their species, breed and age.

**Biochemistry in animal husbandry.** There is a basic discipline that provides the basic concepts on proteins, lipids, carbohydrates, minerals, vitamins, enzymes, hormones, their biological roles in the body and has important practical value. It is an objective basis for modern animal husbandry and other related industries. Mastering of knowledge of biochemistry allows the specialist to consciously understand different biotechnological processes for production and processing of livestock products.

**Mechanization of production processes in animal husbandry.** The objective of this discipline is to help students acquire knowledge and skills enabling them to substantiate mechanized processes in animal product production enterprises. The discipline highlights the main provisions of zootechnical requirements for the performance of mechanization processes in animal husbandry; operating principles and process control over animal production machinery and equipment; economic evaluation of machinery and assemblies.

## Optional components

### *Optional Block 1 (University Choice)*

Annotations of disciplines “History of Ukrainian Statehood”, “Ethnocultural”, “Philosophy”, “Ukrainian for Professional Purposes”, “Foreign Language (English, German, French, Spanish)”, “Physical Training”, “Labour and Life Safety”, “Legal Personal Culture” see Section 2.1.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Introduction to core professional course.** The objective of this discipline is to provide future professionals with necessary knowledge about structure of educational institutions and educational system in the country; teach them the concepts of development on which the leading universities in Europe and across the world base their activity; modern technologies of milk, beef, pork, sheep and goat production, beekeeping, horse breeding, poultry, rabbits and fur farming.

**Physiology of agricultural animals.** The discipline provides students with theoretical knowledge about basic physiological processes in the farm animals’ body: circulation, digestion, respiration, metabolism and energy exchange, reproduction, excretion, lactation. It introduces the future professionals to neurohumoral regulatory mechanisms of animals. Special attention is paid to physiology of muscles and nerves in the central nervous system, higher nervous activity and analyzers (senses).

**Genetics in animal husbandry.** The discipline studies cytological and molecular basis of heredity and variation; structure and function of genes; genetics of ontogeny and populations. Genetics is necessary for planning of domestic animals’ breeding and enables the professionals to understand the nature of biodiversity; prevention of hereditary diseases and abnormalities in farm animals. Application of genetic techniques makes it possible to predict manifestations of breeding traits in animal phenotype.

**Animal nutrition and feed technology.** The discipline is aimed at fostering in students the knowledge, abilities and skills in scientifically substantiated animal feeding, storage and rational use of feeds. The students study biology of individual species and sex-age groups of animals, the role played by nutrients in the functions of living organism; organization of full-value animal feeding based on detailed rules, rational methods, preparation of forages with regard to environmental and economic conditions and animal welfare.

**Ecology in animal husbandry.** Studying the relations of organisms (individuals, populations of animals, biocenoses, etc.) with each other and with the environment, the general laws of the functioning of ecosystems, including under the influence of anthropogenic factors and is the basis of safe production of livestock products.

**Animal hygiene.** The discipline helps students to get better knowledge about the science of protecting and preserving animal health; it studies sanitary and veterinary-sanitary requirements for environmental factors and livestock buildings; considers the influence of microclimate and quality of feed, water and soil on animal health and productivity; effective ways of preventing the negative impact of harmful substances on animals; regulations and sanitary requirements for housing, feeding and maintenance of various farm animal types and sex-age groups, livestock buildings and equipment for animals.

**Animal breeding.** The objective of this discipline is to teach students the origins and evolution of agricultural animals; main features of breeds; patterns of individual agricultural animal breeds and species; exterior, interior, agricultural productivity of animals and factors causing them; selection of agricultural animals; evaluation and selection of animals by phenotype, progeny, origins; organizational aspects of agricultural animal selection; methods and forms of agricultural animal selection.

**Technology of rabbit breeding and animal farming.** The objective of this discipline is to provide students with a system of theoretical knowledge and practical skills in breeding, feeding, maintenance of rabbits and production of rabbit products: meat, pelts, down.

**Ecology in livestock.** It studies the relationships of organisms (individuals, animals populations and other biomes.) with each other and with the environment, the general laws of functioning of ecosystems, including those under the influence of anthropogenic factors and is the basis for safe livestock production.

**Technology of poultry production.** The discipline studies breeds and cross breeds of various poultry species; specifics of breeding and incubation of chicken, duck, geese, turkey, quail, guinea fowl and ostrich eggs; modern production and processing of poultry and eggs, and fatty liver of ducks and geese.

**Technology of beekeeping.** The discipline reveals for students the basic provisions of bee colonies' productivity through introduction of technological keeping and breeding methods based on a high genetic potential; creating optimal conditions for the growth and development of bees; compliance with sanitary and hygienic norms and rules; advanced technologies of producing honey, wax, pollen (bee pollen), propolis (bee-glue), royal jelly and bee venom; biology and chemistry of honey, wax and other biologically active products' making process. The discipline allows students to study properties of biologically active products, their effect on quality of different factors and methods of determining fraud; organization of production at the apiaries of different ownership.

**Technology of goats production.** The discipline is part of a special technology and is taught to provide students with a system of theoretical knowledge and practical skills in breeding, biotechnology reproduction, feeding, maintenance of goats and production of goats products.

**Technology of milk and beef production.** The discipline introduces students to biological characteristics, growth parameters, reproduction and breeding of cattle. Students are taught the basics of modeling processes in cattle breeding; technologies of breeding replacement calves and milk production at conventional and specialized farms with extensive use of energy saving technologies.

**Technology of pig production.** The discipline emphasizes the economic importance and prospects of pig breeding; biological and nutritional value of pork; swine origins; biological characteristics of wild and domestic pigs; breeding factors; stages of creating modern breeds; different breeds of pigs; breeding work in farms of different categories; maintenance and feeding of pregnant and lactating females; biological features and critical periods in raising pig lings; substantiation of piglet weaning schedule; technology of pig farming; raising replacement calves; fattening pigs.

**Technology of sheep production.** The discipline is part of a special technology and is taught to provide students with a system of theoretical knowledge and practical skills in breeding, biotechnology reproduction, feeding, maintenance of sheep and production of sheep products.

**Horse husbandry.** The discipline considers the study of the basic ways of horse husbandry development in Ukraine, biological characteristics of horses which are connected with their maintenance, feeding, reproduction, behavior, adaptation to the conditions of existence and utilizes; origin of horses and their wild relatives, study of common origin and characteristics of species differentiation; creating the conditions and

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methods of improvement and improvement of breeds of horses for various purposes; the main areas of productivity and development of the industry in the short and long term (state or private horse breeding).

**Technology of processing livestock products.** The discipline provides knowledge about processes of manufacturing a wide range of high-quality animal products; regulatory requirements for quality of raw materials and manufactured products made from it based on existing technologies and manuals at processing plants; assessment of their quality according to requirements set forth in normative documentation.

### **Optional components**

#### ***Optional Block 2 (Student's Choice)***

**Mathematical methods in Biology.** The discipline introduces the students to the personal computer and teaches them to use it for solving problems associated with major disciplines. The discipline considers the structure of personal computers and operating systems; the basics of text and spreadsheet documents and statistical data analysis applications used to optimize them.

**Biophysics in animal husbandry.** The discipline provides students with a deep knowledge of physics and biophysics fundamentals; it studies the physical and physicochemical phenomena in biological objects; the fundamental processes in wildlife. The specifics of the course are determined by the need to study the laws of physics that underlie any process, physical characteristics and properties (mechanical, thermal, electrical, magnetic, optical) of animals, effects produced on animals by a variety of external physical factors (light, sound, ultrasound, infrasound temperature, electric and magnetic fields, etc.), the ability of animals to perceive and respond to these factors.

**Microbiology in animal husbandry.** The objective of this discipline is introduce students to classification, nomenclature, morphology, physiology and genetics of microorganisms and determine their role in the cycling of matter in nature; study the effect produced on microorganisms by environmental factors; analyze microflora of air, water, soil, food, foodstuff, agricultural and industrial raw materials of plant and animal origin.

**Forage production.** The discipline covers a science-based system of organizational, economic, biological, technological and economic activities of production, harvesting and forage preserving.

**Research methodology.** The discipline studies basic principles of research methodology in animal production; modern classification and methods of zootechnical experiments; selection methods; systematization and analysis of scientific information and research; rules applicable to writing scientific work and protection of intellectual property rights.

**Biotechnology in animal husbandry.** The discipline studies the possible practical applications of basic biology achievements and methods of receiving biologically active substances to improve reproductive function in animals. The discipline also teaches future professionals how to intensify the selection process by receiving and transferring embryos from the best breeding animals.

**Fishing.** The discipline studies the organizational structure of pond fisheries; their arrangement; biology of major cultivation facilities in pond fishery aquaculture; the impact of environmental factors on aquatic activity; the basics of selection and breeding in fish farming; methods and measures applied to intensify pond fishery; fish reproduction techniques; basic technological processes in warm- and cold-water aquaculture; fish diseases and basic health care and prevention activities in fish farming.

**Principles of veterinary medicine.** Provides mastering the basics of the anatomical structure of farm animals, classification and specifics of the diseases spread, methods and ways of prevention and treatment of farm animals diseases.

**Meat stockbreeding.** It provides for students forming of modern deep knowledge by Meat stockbreeding questions in market conditions. The program provides studying of cattle biology, livestock systems of sustentation, feeding of meat breeds cattle, stimulants of animal productivity, production of ecologically pure beef, slaughter and processing of cattle, meat productivity of cattle management.

**Economics of animal.** The discipline provides students with knowledge about the laws underlying development of social production, its mechanisms and the effective use of economic laws for better satisfaction of consumers' physical, social and economic needs. The discipline sets forth basic principles of economic development; basics of market economy; economic growth and socio-economic progress; the world economy and international economic relations.

**EU Directives and standards in animal husbandry.** The discipline envisages the study of EU Directives and state regulatory documents on livestock production technologies. A student must know the requirements of state normative documents (laws, regulations, standards, recommendations, instructions) and EU countries regarding the production of livestock products, be able to assess its compliance with these requirements in order to obtain quality products.

**Technology of slaughter products.** The discipline studies the issues related to quality and technological characteristics of meat productivity of farm animals as raw materials for processing industry; delivery of slaughtered animals to meat processing factories under existing systems and normative documentation; technology and slaughter products' processing and storage; evaluation of meat quality indicators for its technological and culinary properties and methods of preserving meat and meat products.

**Legal regulation of livestock.** It studies general characteristics of legal regulation of livestock; breeding regulation; beekeeping regulation; regulation of dairy production and selling; regulation i of fish farming and fishery; legal support of quality and safety of agricultural products; regulation of production and sale of fur and leather products; regulation of production, procurement, getting, preserving, transport and sale of poultry eggs; regulation of silk; tools of state regulation of the livestock industry in Ukraine.

**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.

## **2.4 EDUCATION AND RESEARCH INSTITUTE OF FORESTRY AND GARDEN-PARK MANAGEMENT**

**Director** - Doctor of Agricultural Sciences, professor **Petro Ivanovych Lakyda**

Tel: (+38044) 527-85-28 E-mail: lakyda@nubip.edu.ua

Location: educational building №1, room 119

The INSTITUTE organizes and coordinates the educational process of bachelors in the following specialties:

### ***205 Forestry***

Educational-professional Program “**Forestry**”

Graduating departments:

Forest restoration and meliorations

Tel.: (044) 527-87-47

E-mail: forest\_crops@nubip.edu.ua

Head of the Department – PhD of Agricultural Sciences, professor Viktor Maurer

Silviculture

Tel.: (044) 527-82-82

E-mail: lisivnutstvo@gmail.com, npuzrina@nubip.edu.ua

Head of the Department – doctor of science, professor Anatolii Bondar

Forest Mensuration and Forest Management

Tel.: (044)527-85-23

E-mail: bilous@nubip.edu.ua

Head of the Department – doctor of science, professor Andrii Bilous

### ***206 Park and Gardening Management***

Educational-professional Program “**Park and Gardening Management**”

Graduating departments:

Landscape Architecture and Phytodesign:

Tel.: (+38044) 527-82-96 E-mail: land\_art@nubip.edu.ua

Head of the department - Doctor of Biological Sciences, professor Elena Kolisnichenko

Botany, Dendrology and Forest Tree Breeding:

Tel.: (+38044) 527-85-18 E-mail: dendrology\_nubip@ukr.net

Head of the department - Candidate of Agricultural Sciences, associated professor Yuri Marchyk

### ***187 Woodworking and furniture technologies***

Educational-professional Program “**Woodworking and furniture technologies**”

Graduating department:

Wood products technologies and design:

Tel.: (+38044) 527-81-67 E-mail: opinchewska@gmail.com

Head of the department - Doctor of Technical Sciences, professor Olena Pinchevska



**Bachelor**  
**Field of Knowledge "Agricultural science and food"**  
**in specialty "FORESTRY"**  
**Educational-professional program "Forestry"**

Form of Training:	Licensed number of persons:
Full-time	125
Part-time	140
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian
Qualification	Bachelor of Forestry

**The concept of training**

Forestry is the sector of the economy that deals with research, account and reproduction of forests, protecting them from fires, pests and diseases, reforestation and afforestation, forest regulation, increasing of forest productivity, aesthetic, sanitary and hygienic conditions of plantings. It is a very important component of the economy of Ukraine.

Training of experts has following main objectives: improving environmental education, public awareness on forestry management and removal of social stress regarding the methods and means of forestry management by informing the public about close to nature forestry, multiple use of forest resources, public involvement in solving forestry problems and consultation with local communities about decisions that have significant ecological, recreational and economic importance and can cause significant social resonance, training in the organization of forest and landscape management on the principles of close to silviculture, providing multifunctional forestry and landscape management and efficient, continuous and sustainable, multi-use forest resources, taking into account landscape and watershed principles of forest management, conservation of natural biodiversity at all levels - from the genetic one to the species, ecosystem and landscape, providing continuous, high-efficient implementation of plantings environmental, economic and social functions at local, national and global levels.

**Practical training**

The bases of practical training are educational, research, training and manufacturing laboratories of the Institute Departments and IP NUBiP Ukraine "Boyarka Forest Research Station," Trainig and Research Nursery of the Reforestation and Afforestation Department, Botanical Garden of NULES of Ukraine.

**Proposed Topics for Bachelor theses**

1. Peculiarities of thinning and selection group cutting in pine stands of forestry enterprises.
2. Natural regeneration of Scotch pine.
3. Condition of forest fire protection in forestry enterprises and ways of its improvement.
4. The analysis of methods for determining the stock of mature spruce stands of forestry enterprise.
5. Harmful insects in the young pine forests in forestry enterprises and their forest values.

6. The analysis of the current condition of hunting fauna and ways to optimize the number of hunting lands in forestry enterprises.
7. The experience of plant growing material in a forest enterprise.
8. Current state and erosion control properties of protective forest plantation in the forestry enterprises.
9. Economic features of management activities in the forest enterprise involving private structures.
10. Peculiarities of reproduction of the German medlar tree using green cuttings.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational-professional programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

After receiving a Bachelor degree graduates can be employed in forestry enterprises of the State Agency of forest resources, communal enterprises of gardening or landscaping, state and private game management farms and forestry research institutions.

**Bachelor`s Program and Curriculum  
in Specialty «Forestry»  
Educational-professional program “Forestry”**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Higher mathematics	4	exam
CC 2	Chemistry	4	exam
CC 3	Botany	8	exam
CC 4	Fundamentals of Ecology and Nature Protection	4	exam
CC 5	Physics	4	exam
CC 6	IT Innovations	6	exam
CC 7	Geodesy	4	exam
CC 8	Dendrology	7	exam
CC 9	Forest pedology	5	exam
CC 10	Biometry	4	exam
CC 11	Earth remote sensing	4	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian Statehood	4	exam
OB 1.2	Philosophy	4	exam
OB 1.3	Ukrainian for professional purposes	4	exam
OB 1.4	Foreign language (English, German, French, Spanish)	6	exam
OB 1.5	Physical training	4	credit
OB 1.6	Labour and life safety	4	exam
OB 1.7	Legal culture of personality	4	exam
<b>The volume of components of the general training cycle</b>		<b>84</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 12	Forest zoology	4	exam
CC 13	Mechanization of forestry work	6	exam
CC 14	Forest phytopathology	4	exam
CC 15	Silviculture	7	exam
CC 16	Forest inventory	7	exam
CC 17	Forest entomology	4	exam
CC 18	Forest plants	10	exam
CC 19	Economics of forestry	4	exam
CC 20	Forest melioration	5	exam
CC 21	Forest Management	7	exam
CC 22	Organization of Forestry Production	6	
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.8	Information Technology of forestry	4	exam
OB 1.9	Forestry entrepreneurship	4	exam
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1.1	Plant physiology	4	exam
OB 2.1.2	Economic theory	4	exam
OB 2.1.3	Forest selection and genetics	5	exam
OB 2.1.4	Non-timber forest resources	5	exam
OB 2.1.5	Fundamentals of hydrotechnical reclamation	5	exam
OB 2.1.6	Urban landscaping	4	exam
OB 2.1.7	Forestry commodity	4	exam
OB 2.1.8	Forest pyrology	4	exam
OB 2.1.9	Accounting in Forestry	4	exam
OB 2.1.10	Politology and sociology	4	exam

OB 2.1.11	Principles of professional training	4	exam
OB 2.1.12	Timber transportation	4	exam
OB 2.1.13	Natural reserves	4	exam
OB 2.1.14	Fundamentals of forest exploitation		
<b>The volume of components of the special (professional) training cycle</b>		<b>132</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 23	Academic Practice	20	
CC 24	Production Practice	3	
CC 25	Preparation and defense of undergraduate final work	4	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Higher mathematics.** Elements of analytic geometry. Linear Algebra. Calculus. Differential calculus of functions of one variable. Integration. Functions of several variables. Differential equations and series.

**Chemistry.** Theoretical foundations of Chemistry. Organic Chemistry. Stoichiometric laws. Structure of atoms, kinetics of chemical reactions. Solutions. Oxidation-reduction reactions. Electrolysis. Corrosion of metals, features of main chemistry elements. Classification of organic compounds. Classification of cations and anions. Action of group reagents, features of the division into groups. Reactions. The analysis of unknown substances. Methods for determining the concentration of solutions. Fundamentals of neutralization, permanganatometry. Determination of related substances in solution.

**Botany.** Structure, activity and plant diversity. The lower and higher plants, their origin, phylogenetic relationships, the value for the national and forest management. Morphology and productivity of forest biocenosis, their sustainable use and conservation.

**Fundamentals of Ecology and Nature Protection.** Theoretical foundations of ecology. The doctrine of the biosphere. Ecosystem and biogeocoenosis. Trophic chains. Pollution. Forestry production and its environmental impact. Cost-effectiveness of environmental measures.

**Physics.** Mechanics, kinematics and dynamics of point and solid. Molecular physics and thermodynamics. Electrostatics. An electric current and electromagnetism. Oscillations and waves. Optics. Elements of quantum mechanics. The structure of the nucleus. Radioactivity. Effect of radiation on biological objects.

**Informatics.** Hardware and software of computers. Personal computers. The system software. Programming languages. Algorithmic and programming tasks. Solving problems on PC.

**Geodesy.** The general concept of geodesy, orientation of lines on the ground; coordinates in geodesy, making measurements with theodolite, ways to determine the area of land; geometric leveling, engineering design for profile, leveling the surface, terrain, topographic map, range maps, solving a topographic map; basics of aerial photography and interpretation of aerial photographs, topographic and geodesy works in forest inventory.

**Dendrology.** Ecology of plants. Type, intraspecific systematic unity. Types of habitats. Life forms and cycles. Phylogenetic system. Dendroflora of Ukraine. Introduction of plants. Phytocenology. Forest formations and associations.

**Forest pedology.** Soil formation processes. Mineral and organic parts of the soil. The pattern of distribution of soils in Ukraine. Soil properties according to vegetation.

**Biometrics.** Fundamentals of the theory of probability. Numerical characteristics and patterns of distribution of a random variable. Statistics. The simplest model analysis of variance. Correlation analysis. Selective methods as a basis for obtaining the forest information.

**Earth remote sensing.** Methods of remote sensing based on registration and further interpretation of the reflected solar radiation from the surface of the soil, vegetation, water and other facilities. Transporting (waftage) of recording device, into the air-Earth space allows you to get a much wider coverage area than ground-based research methods. The quality and applicability of the data (during remote sensing) are influenced by spectral range of shooting, spatial accuracy, radiometric accuracy, spatial coverage, efficiency and repeatability of shooting, and the cost of data.

### Optional components

#### *Optional Block 1 (University Choice)*

Annotations of disciplines “History of Ukrainian Statehood”, “Philosophy”, “Ukrainian for Professional Purposes”, “Foreign Language (English, German, French, Spanish)”, “Physical Training”, “Labour and Life Safety”, “Legal Personal Culture” see Section 2.1.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Forest zoology.** Species composition and peculiarities of forest fauna spreading, results of people’s impact on forest fauna, examples of positive and negative effects of mammals and birds on forest environment, understanding the causes of animals extinction and methods for their preservation, the foundation of legislation to protect wildlife.

**Mechanization of forestry work.** Structure of different machines used in forestry such as tree planters and others. Machines for the protection and preservation of the forest. The mechanization of thinning the forest. Information about machine and tractor units.

**Forest Phytopathology.** Pathogens of seedlings, plants, seeds, pine needles, leaves and symptoms of their manifestation. Root and stem rot. Eatable and poisonous mushrooms. Methods and ways of forest protection. Technology of the forest protection.

**Silviculture.** Silvics as a theory about the forest nature. Biology, morphology, typology and ecology of the forest. Reproduction, development and growth. Practical silviculture. Systems and methods of cuttings. Intermediate cuttings. Increase of forest productivity.

**Forest inventory.** Inventory of wood and wood products. Forestry-taksatsiyni signs and taksatsiyna structure stands. Methods for determining stock and wood increment. Inventory forests. Basic approaches to non-timber forest resources inventory.

**Forest entomology.** Biology, taxonomy and classification of insects. Environmental factors and trophic relationships. Methods of plantations protection. Needles and leaf-eating, stem pests. Seeds, nurseries, young plantations and wood pests.

**Forest planting.** Significance and organization of forest plant nurseries. Peculiarities of plant material cultivation. Planting seeds and seedlings and their maintenance. Cultivation of basic valuable tree species. Technology of artificial forest plantations.

**Economics of forestry.** The Law of demand, offers, cost and competition. Production and resource potential under conditions of a market economic system. Formation of the gross national product in the state regulation of the economy development.

**Forest reclamation.** Major forestry and agroforestry principles that determine the technology of establishment and cultivation of protective forest plantations. Soil erosion and the fight against it. Agrotechnical peculiarities of creation and cultivation of agroforestry plantations on eroded lands. Sands, their consolidation and economic development.

**Forest management.** Forest management as a system of measures for forest inventory and forest management. Economic foundations of forest management in Ukraine. The division into categories of protection forests. The economic organization of forestry. Maturity of forest plantations. The organization of forest management. Inventory of forest resources. State registration of forests and state forest cadaster. Designing forest management during such types of work as the main timber harvesting, logging, reforestation and afforestation, etc. Designing forest management measures and their economic efficiency. Forest management techniques and their classification.

**Organization of Forestry Production.** Organization of production as an applied economic discipline. Forestry enterprises. Organization of work. Organization of the use of means of production. Organization of forest management, forest protection, reforestation, forestry activities. Effective planning of industrial activity. Financial support of production. Efficient analysis of industrial activity.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines "Information technology in the industry" see Section 2.1.

**Forestry entrepreneurship.** Study of Forest Management related Ukrainian Legislation. Business plan: compilation and execution. Organization activity of a forestry enterprise.

#### ***Optional Block 2 (Student's Choice)***

**Plant physiology.** Physiology of plant cell. Water exchange of plants. Photosynthesis. Respiration. Mineral nutrition. Growth and development of plants. Ripening of fruits and seeds. Adaptation of plants and their resistance.

**Economic theory.** Examining the patterns of social production, mechanism of action and effective utilization of economic laws people to best meet their physical, social and economic needs. The general principles of economic development; The general principles of the market; of market economy; economic growth and social and economic progress; formation and development of socio-economic systems; world economy and international economic relations.

**Forest selection and genetics.** Methods of selection. Selective inventory of plants. Selection of main forest species. The basis of genetics/

**Non-timber forest resources.** The course examines the methods of rational use of non-wood forest resources, ways to improve the quality and productivity of grasslands,

harvest methods, technology, collecting fodder, wild fruits, berries, mushrooms, medicinal plants, birch juice. Covers the basics of beekeeping.

**Basics of hydrotechnical reclamation.** The theoretical bases of hydrotechnical reclamation of forest lands, irrigation of forest nurseries and plantations. Sources of irrigation, salinity and measures to control it. Drainage by means of open channels and horizontal drainage system. Use of moisturizing drainage-systems and special drying methods.

**Urban landscaping.** The role of vegetation in creating the environment. Design of landscape. The technology of landscape construction. Landscaping villages and towns. List of woody plants for landscaping.

**Forestry commodity.** The structure, composition, physical and mechanical properties of wood, how to modify them, defects of wood, methods of drying and storage timber. Properties production logging, sawmills, planing, production of special types: standard dimensions, tolerances, allowances, sorting, measurement, recording, marking.

**Forest pyrology.** Forest pyrology examines the basic theory of combustion, fire hazard depending on the nature of the forest and weather conditions and classifies forest fires. We study fire prevention, the role of communication in operational fire detection techniques and tactics of fighting forest fires, estimation of losses from fires. Basic theory of combustion. Classification of forest fires. Preventive measures. Technical ways and tactics of fighting forest fires. Estimation of the damage.

**Accounting in Forestry.** Discipline studies directly accounting records as a management function. The main elements studied are: a system of accounts, forms of record keeping, rendering of accounts, and a rule of double entry accounting as a basic record rule. It also deals with the audit.

**Principles of professional training.** Discipline acquaints students - especially freshmen studying at the university, with the rights and duties of university students, history of the Forestry faculty of the National University of Life and Environmental Sciences of Ukraine, internal rules of the institution, organization of educational process, forms of training according to the curriculum, the hygiene of mental work and general rules of the work with a book and in the library. Emphasis is placed on the study of traditional features of separate discipline groups, which are taught at the faculty.

**Politics and sociology.** Laws, structure and functions of political science. Power and power relations. The political system of society, the role and place in her state. Political consciousness and political culture. Politics and national relations. National and state development of Ukraine. The social nature. Formation of human behavior in the workplace activity and his place in the motivation system and the means of social control. The role of staff members and a small group in achieving production.

**Timber transportation.** Discipline includes the following major sections: Technology of logging and harvesting, organization of transport operations in forestry; automobile, railway and water transport.

**Natural reserves.** The concepts, the task of environmental education, basic directions, forms and methods of natural-guarding propaganda based on natural protected areas, ecological trail as a method of environmental education, training and recreation, environmental movement, religion and nature protection.

**Basics of forest exploitation.** Cutting Fund. The main phases of forest exploitation. Organization of logging operations. Basics of wood processing theory. Methods for moving wood. Performance of cutting and wood processing machines and mechanisms.

**Bachelor**  
**Field of Knowledge "Agricultural science and food"**  
**in specialty "PARK AND GARDENING MANAGEMENT"**  
**Educational-professional program "Park and Gardening Management"**

Form of study	Limit of licensed number of students
Full-time	100
Part-time	60
Learning time	4 years
Credits ECTS	240
Language of teaching	Ukrainian
Qualification of graduates	Bachelor of Park and Gardening Management

**The concept of training**

Park and gardening management is the sector of the economy that deals with research, account and reproduction of forests, parks, gardens and public parks, protecting them from fires, pests and diseases, reforestation and afforestation, aesthetic, sanitary and hygienic conditions of plantings. It is a very important component of the economy of Ukraine.

Training of experts has following main objectives: improving environmental education, public awareness on park and gardening management and removal of social stress regarding the methods and means of forestry management by informing the public about close to nature forestry, public involvement in solving forestry problems and consultation with local communities about decisions that have significant ecological, recreational and economic importance and can cause significant social resonance, training in the organization of forest and landscape management on the principles of close to silviculture, providing multifunctional forestry and landscape management and efficient, continuous and sustainable, multi-use forest resources, taking into account landscape and watershed principles of forest management, conservation of natural biodiversity at all levels - from the genetic one to the species, ecosystem and landscape, providing continuous, high-efficient implementation of plantings environmental, economic and social functions at local, national and global levels.

**Practical training**

The bases of practical training are educational, research, training and manufacturing laboratories of the Institute Departments, Trainig and Research Nursery of the Reforestation and Afforestation Department, Botanical Garden of NULES of Ukraine, MM Gryshko Central Botanical Garden, National Academy of Sciences of Ukraine; Fomin Botanical Garden; Corporation "Ukrzelenbud", CE "Kievzelenstroy" and regional trusts to maintain green spaces, regional and district communal enterprises of gardening.

**Approximate themes of the undergraduate final works  
(Bachelors' Theses)**

1. Natural regeneration of Scotch pine.
2. Economic features of management activities in the forest enterprise involving private structures.



3. Project proposals concerning the reconstruction of green plantations in Kirovograd's park.
4. Project proposals with regard to the reconstruction of parks of landscape architecture memorial value.
5. Landscaping project of the school territory and kindergartens.
6. Dendrological evaluation of the existing assortment of gymnosperms and prospects to replenish the collection of decorative forms at the M.M. Gryshko National Botanic Garden.
7. Technological features of the forcing treatment of sorts Tulipa L. and Crocus L.
8. Peculiarities of reproduction of the German medlar tree using green cuttings.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

After receiving a Bachelor degree graduates can be employed in communal enterprises of gardening or landscaping, state and private game management farms and forestry research institutions.

**Bachelor`s Program and Curriculum in Specialty  
«Park and Gardening Management»  
Educational-professional program «Park and Gardening Management»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Higher mathematics	4,00	exam
CC 2	Chemistry	5,00	exam
CC 3	Physics	4,00	exam
CC 4	Fine arts	6,00	exam
CC 5	Botany	8,00	exam
CC 6	Geodesy	6,00	exam
CC 7	General ecology	4,00	exam
CC 8	Plant physiology	4,00	exam
CC 9	Biometry	4,00	exam
CC 10	Decorative dendrology	11,00	exam
CC 11	Forest pedology	7,00	exam
CC 12	Economic theory	4,00	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Foreign language	5,00	exam
OB 1.2	Professionally-oriented Ukrainian language	4,00	exam
OB 1.3	Physical education *	4,00	test
OB 1.4	History of Ukrainian Statehood, political and sociology science	4,00	exam
OB 1.5	Labour and Life Safety	4,00	exam
OB 1.6	Legal Personal Culture	4,00	exam
OB 1.7	Philosophy	4,00	exam
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 13	Breeding and Genetics ornamental woody plants	6,00	exam
CC 14	Floriculture	6,00	exam
CC 15	Pests and pathogens of woody ornamentals	8,00	exam
CC 16	Lawns	4,00	exam
CC 17	Urban gardening	4,00	exam
CC 18	Introduction and adaptation of decorative plants	4,00	exam
CC 19	Landscape Architecture	8,00	exam
CC 20	Economics of garden-park management	4,00	exam
CC 21	Garden and park construction	7,00	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>118</b>	
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.8	Principles of professional training	4,00	exam
OB 1.9	IT Innovations	5,00	exam
OB 1.10	Entrepreneurship in the gardening industry	4,00	exam
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1	Mechanization of GPM	4,00	exam
OB 2.2	Basics of city planning	4,00	exam
OB 2.3	Plant nurseries and seeds	4,00	exam
OB 2.4	Recreational forestry	4,00	exam
OB 2.5	Basics of composition	4,00	exam
OB 2.6	Computer design	4,00	exam
OB 2.7	Topiary art	4,00	exam
OB 2.8	Decorative plants in greenhouses	4,00	exam

OB 2.9	Inventory of garden-park management	6,00	exam
OB 2.10	Fundamentals of afforestation	4,00	exam
OB 2.11	Urban ecology and phyto-melioration	4,00	exam
OB 2.12	Engineering equipment in GPM	5,00	exam
OB 2.13	Organization of garden-park management	4,00	exam
OB 2.14	Natural reserves	4,00	exam
OB 2.15	Basics of accounting in gardening	4,00	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>105</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 22	Academic Practice	<b>10,0</b>	
CC 23	Production Practice	<b>3,0</b>	
CC 24	Preparation and defense of undergraduate final work	<b>3,0</b>	
CC 25	State attestation	<b>1,0</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Higher mathematics.** Elements of analytic geometry. Linear Algebra. Calculus. Differential calculus of functions of one variable. Integration. Functions of several variables. Differential equations and series.

**Chemistry.** Theoretical foundations of Chemistry. Organic Chemistry. Stoichiometric laws. Structure of atoms, kinetics of chemical reactions. Solutions. Oxidation-reduction reactions. Electrolysis. Corrosion of metals, features of main chemistry elements. Classification of organic compounds. Classification of cations and anions. Action of group reagents, features of the division into groups. Reactions. The analysis of unknown substances. Methods for determining the concentration of solutions. Fundamentals of neutralization, permanganometry. Determination of related substances in solution.

**Physics.** Mechanics, kinematics and dynamics of point and solid. Molecular physics and thermodynamics. Electrostatics. An electric current and electromagnetism. Oscillations and waves. Optics. Elements of quantum mechanics. The structure of the nucleus. Radioactivity. Effect of radiation on biological objects.

**Fine Arts.** It covers issues that provide the skills and abilities to find the necessary artistic means for the transfer of aesthetic value, coloristic features of landscape compositions by means of fine arts. The discipline is directed at acquaintance with the means of fine arts, which can be used to perform demonstrative drawings of the graphic part of the landscape projects.

**Botany.** Structure, activity and plant diversity. The lower and higher plants, their origin, phylogenetic relationships, the value for the national and forest management. Morphology and productivity of forest biocenosis, their sustainable use and conservation.

**Geodesy.** The general concept of geodesy, orientation of lines on the ground; coordinates in geodesy, making measurements with theodolite, ways to determine the area of land; geometric leveling, engineering design for profile, leveling the surface, terrain, topographic map, range maps, solving a topographic map; basics of aerial

photography and interpretation of aerial photographs, topographic and geodesy works in forest inventory.

**General ecology.** The concepts, the task of environmental education, basic directions, forms and methods of natural-guarding propaganda based on natural protected areas, ecological trail as a method of environmental education, training and recreation, environmental movement, religion and nature protection.

**Plant physiology.** Physiology of plant cell. Water exchange of plants. Photosynthesis. Respiration. Mineral nutrition. Growth and development of plants. Ripening of fruits and seeds. Adaptation of plants and their resistance.

**Biometry.** Fundamentals of the theory of probability. Numerical characteristics and patterns of distribution of a random variable. Statistics. The simplest model analysis of variance. Correlation analysis. Selective methods as a basis for obtaining the forest information.

**Decorative dendrology.** Ecology of plants. Type, intraspecific systematic unity. Types of habitats. Life forms and cycles. Phylogenetic system. Dendroflora of Ukraine. Introduction of plants. Phytocenology. Forest formations and associations.

**Forest pedology.** Soil formation processes. Mineral and organic parts of the soil. The pattern of distribution of soils in Ukraine. Soil properties according to vegetation.

**Economic theory.** Examining the patterns of social production, mechanism of action and effective utilization of economic laws people to best meet their physical, social and economic needs. The general principles of economic development; The general principles of the market; of market economy; economic growth and social and economic progress; formation and development of socio-economic systems; world economy and international economic relations.

## Optional components

### Optional Block 1 (University Choice)

**Foreign Language.** Comprehensive teaching of linguistic activities (reading, listening, speaking). Mastering the skills of communication and translation.

**Professionally-oriented Ukrainian language.** Preparation of students for oral and written business communication, which involves working with various types of scientific and business documentation. Work with special texts in the specialty.

**Physical Education\*.** The purpose of teaching discipline is to form the physical culture of a young specialist and the ability to implement it in the social-professional training and family. The task of studying the discipline is to strengthen the health of students and the development of physical abilities that correspond to the professional activity of a future specialist.

**History of Ukrainian Statehood, political and sociology science.** Study of objective laws of development, the Ukrainian state. Adoption of the Constitution of Ukraine. Analysis of the general problems of transition of Ukraine to a social market economy and integration into the world community. National-state development of Ukraine.

**Labour and Life Safety.** General patterns of emergence and development of hazards, emergencies. Their properties, the possible impact on the life and health of man. Safety of life in emergency situations. Organization and management of life safety.

**Legal Personal Culture.** Integrated legal discipline, which is based on the system of scientific knowledge from various branches of legal science. Law science is one of the oldest social sciences. Actually, the emergence of legal science is associated with the emergence and development of law and the first information about the state and law.

**Philosophy.** The system of philosophical knowledge of the main sections of philosophy, developing a type of consciousness, which is based on constructive-critical approaches to the ideals of humanism.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Breeding and Genetics ornamental woody plants.** Methods of selection. Selection inventory of plantings. Selection of the main forest species.

**Floriculture.** Discipline "Floriculture" involves the study of biological and ecological features of the development, propagation and cultivation of flower-ornamental crops unprotected soil, mastering theoretical knowledge of the growth and development of annual, biennial, perennial flowers and ornamental plants that are used to create different types of flower beds, gain practical skills with their propagation and planting in flower beds, flower beds drafting and passing them on objects SPB. The second part of the course provides the study of technology of growing crops in greenhouses under conditions of industrial production.

**Pests and pathogens of woody ornamentals.** The causative agent of seedlings, planting seeds, needles, leaves and symptoms of their display. Root and stem rot. House, edible and poisonous mushrooms. Methods and means for ornamentals. Technology protection forest park plantings. Biology, taxonomy and classification of insects. Environmental factors and trophic relationships. Methods and means of protecting the forest park plantings. Needle- and leaf-eating, stem pests. Pests seeds, nurseries, young plantations and wood.

**Lawns.** The course deals with theoretical and practical aspects of the introduction of lawns, reveals in detail the classification of lawns, ecological and biological characteristics of lawn grass, methods of environmental assessment of lawn grasses and biological bases for selection of species for lawn. The discipline includes theoretical and practical principles of selection and seed production of basic types of lawn grasses in Ukraine and abroad, use of high-quality lawn grass seed.

**Urban gardening.** The role of vegetation in creating the environment. Design of landscape. The technology of landscape construction. Landscaping villages and towns. List of woody plants for landscaping.

**Introduction and adaptation of ornamental plants.** Introduction and adaptation of plants have great theoretical and practical importance. During the course students are introduced to the theoretical and practical aspects of the introduction of plants, acquire skills with techniques evaluate the success and prospects of introduction. Also considered bioecological features of woody plants in the conditions of introduction.

**Landscape Architecture.** Within the discipline, the historical, social and city building aspects of landscape objects formation are studied. We give a historical overview of the development of landscape gardening styles and their impact on modern trends in landscape architecture. The theoretical bases and practical techniques of landscape design, including architectural planning and space making system for formation of park space, natural and artificial components in the construction of garden compositions are considered.

**Economics of garden-park management.** The Law of demand, offers, cost and competition. Production and resource potential under conditions of a market economic system. Formation of the gross national product in the state regulation of the economy development.

**Park and gardening construction.** Landscape construction is an important part of the overall complex urban planning and urban development. Includes a variety of range in

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complexity issues associated with design, construction, maintenance garden and park facilities, creation, formation and maintenance of an important component - ornamental plants. Landscape construction is a complex of measures providing for solving various problems of legal, crop, aesthetic, organizational, operational and commercial, economic, aimed at creating a garden and park facilities for various purposes.

### Optional components

#### Optional Block 1 (University Choice)

**Principles of professional training.** Discipline acquaints students - especially freshmen studying at the university, with the rights and duties of university students, history of the Forestry faculty of the National University of Life and Environmental Sciences of Ukraine, internal rules of the institution, organization of educational process, forms of training according to the curriculum, the hygiene of mental work and general rules of the work with a book and in the library. Emphasis is placed on the study of traditional features of separate discipline groups, which are taught at the faculty.

**IT Innovations.** Hardware and software of computers. Personal computers. The system software. Programming languages. Algorithmic and programming tasks. Solving problems on PC.

**Entrepreneurship in the gardening industry.** Study of the legislation of Ukraine on the maintenance of a garden-park economy. Business plan: compilation and execution. Organization of the enterprise in the field of gardening.

#### Optional Block 2 (Student's Choice)

**Mechanization of GPM.** Structure tillage, nasinnyezbyralnyh, sowing machines. Machines and tools for protection and protection from diseases, pests and fires some trees and forest park plantings.

**Basics of city planning.** Academic discipline has been developed to inform students about the basics of urban planning and place of landscape planning in its structure.

**Plant nurseries and seeds.** Planning activities for growing decorative plant material. Agrotechnical features of decorative woody plants cultivation as well as their propagating material. Organization of works in nurseries.

**Recreational forestry.** The discipline considers the theoretical and practical basis of farming in the forests of recreational use. Attention is paid to applying differentiated farming in forests of different categories with purpose of different methods and types of cuttings in order to create healthy, economically valuable, aesthetically attractive and comfortable recreational forest plantations while maintaining their resistance to recreational effects. We consider the classification of forest and park landscapes, their aesthetic and hygienic properties. We study the succession of forest biocenosis provided various stages of recreational digression.

**Basics of composition.** In the scope of the discipline "Fundamentals of Arrangement" students learn skills in creating flower compositions using natural plant material of live, canned or artificial. Master the theoretical and practical knowledge on the selection of plants, their harvesting, rules of conservation and modification. Particular importance is given to the education of artistic and aesthetic taste, the ability to work freely in different styles and arrangements. In the process of studying the discipline, students master the layout of the material according to the basic rules of compositional decision in European flower design. Landscape inventory.

**Computer design.** The main task of the discipline is to master modern computer programs used in designing gardening objects in order to visualize and demonstrate design solutions. Obtaining basic practical skills in using computer programs in landscape design.

**Topiary art.** Discipline includes studying the history of topiary art, topiary art elements (hedges, borders, walls, bosquets, green cabinets, trellis with espalier, mazes, alleys, etc.). The study of growing technology and hedges laying. Features of reshaping plant forms and sculptural cutting. Study of making frames technology (for plants).

**Decorative plants in greenhouses.** The course "Decorative plants closed ground" involves studying the biological characteristics of plant growth and development of subtropical and tropical regions of growth and areas with dry climates.

**Inventory of garden-park management.** Regulatory and legislative base is aimed at the development of garden and park facilities. Scientific and theoretical foundations of organization of garden-park objects. Organization and procedure of inventory of forest park objects. Inventory of green spaces in cities and other settlements. Use of inventory information for gardening objects.

**Fundamentals of afforestation.** The questions are related to the restoration of forests in urban landscapes. The principles of selection of forest stand types of different agricultural techniques and the purpose of their creation and growth are examined.

**Urban ecology and phyto-melioration.** Discipline provides studying of patterns of urban areas and theoretical bases of cities ecosystems optimization. Urban ecology compared to other ecological disciplines, reveals the impact of urbanization on the environment, changes in urban landscapes and promotes environmental knowledge. The most effective ways to protect urban areas from adverse natural events and anthropogenic impact.

**Engineering equipment in GPM.** In the training course "Engineering equipment of garden-park facilities" the issue of artificial landscaping garden and park facilities have been studied in detail, which are based on projects of horizontal and vertical layout integration, so the structure of the landscape is resolved for solving architectural and artistic as well as engineering-technical challenges faced by professionals of Landscape Architecture. At the same time students will study methods and ways of placing pipelines, laying underground and utilities on the ground.

**Organization of garden-park management.** Management of Garden-Park business. Fundamentals of Garden-Park Management Planning. Organization of landscaping design in cities and towns. The organization of construction in GPM.. Methods of labor groups management.

**Natural reserves.** Theoretical foundations of ecology. The doctrine of the biosphere. Ecosystem and biogeocoenosis. Trophic chains. Pollution. Forestry production and its environmental impact. Cost-effectiveness of environmental measures.

**Basics of accounting in gardening.** The discipline explores direct accounting as a management function. The main elements to be studied in the course are: the system of accounting accounts at enterprises of garden-park management of various forms of ownership, forms of accounting, reporting and the rule of double entry as the main rule of accounting. Audit issues are also considered.

**Bachelor**  
**Field of Knowledge " Production and technologies"**  
**in Specialty "WOODWORKING AND FURNITURE TECHNOLOGIES"**  
**Educational-professional program «Woodworking and Furniture Technologies»**

Form of Training:	Licensed number of persons:
– Full-time	50
– Part-time	100
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian
Qualification	Bachelor of Woodworking and Furniture Technologies

**Concept of training**

The training of specialists involves the mastering of knowledge and skills in the development of constructions and technologies for the production of wood materials and products, the definition of their characteristics and the level of quality, mastering the methods of analysis of existing technological processes, planning and conducting research aimed at optimization and improvement of technological processes of woodworking industry. The basis of preparation is a systematic approach to the study of wood processing technologies and the formation of students' ability to use the equipment, wood and energy resources rationally.

**Practical training**

The bases of practical training are educational, scientific and production laboratories of the university's departments and separate unit of NULES of Ukraine «Boyarka Forest Research Station». Leading forest enterprises of the State Forestry Agency of Ukraine and private woodworking and furniture enterprises.

**Proposed Topics for Bachelor theses**

1. Analysis of furniture design programs for bedrooms
2. Analysis of the square-edged lumber manufacturing process on the State enterprise
3. Features of the sectional doors manufacturing technological process
4. Justification of the design and technology of office furniture manufacturing
5. Analysis of the parquet from low-value wood manufacturing process
6. Proposals for improvement of door finishing process
7. Estimation of the floor coverings assortment expanding possibility
8. Features of the manufacture of parquet friezes
9. Analysis of the methods of applying paint and varnish materials on furniture products
10. Assessment of the possibilities of improving the technological process of decorating kitchen products



**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

After graduating from the bachelor's degree, graduates can be employed at forest enterprises of the State Agency for Forest Resources, state and commercial enterprises for the production and sale of construction materials, state and commercial woodworking and furniture enterprises.

**Bachelor`s Program and Curriculum in Specialty  
«Woodworking and furniture technologies»  
Educational-professional program «Woodworking and furniture technologies»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Descriptive Geometry and Engineering Graphics	5	Exam
CC 2	Physics	9	Exam
CC 3	Higher Mathematics	8	Exam
CC 4	Computational Mathematics and Programming	8	Exam
CC 5	Chemistry (general and organic)	6	Exam
CC 6	Applied Mechanics (strength of materials, engineering)	8	Exam
CC 7	Principles Heating Engineering	4	Exam
CC 8	Electro Technology And Electric Drive	4	Exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Foreign Language	5	Exam
OB 1.2	Physical education	4	Credit
OB 1.3	Ukrainian for professional purposes	4	Exam
OB 1.4	Labour and Life Safety	4	Exam
OB 1.5	Philosophy	4	Exam
<b>The volume of components of the general training cycle</b>		<b>73</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 9	Wood Science	4	Exam
CC 10	Equipment of The Woodworking	5	Exam
CC 11	Technology Of The Sawmills And Woodworking Industries	6	Exam
CC 12	Technology Of Wood Drying And Protection	9	Exam
CC 13	Ecology	4	Exam
CC 14	Principles Of Automation And AVP	4	Exam
CC 15	Computer Graphics	4	Exam
CC 16	Technology Of Wood Products	7	Exam
CC 17	Fundamentals of professional training	4	Exam
CC 18	Design of wood products	5	Exam
CC 19	Designing Of The Woodworking Enterprises	4	Exam
CC 20	Technology of Protective and Decorative Coatings	5	Exam
CC 21	Technology of joiner's products	5	Exam
CC 22	Economy woodworking industry	5	Exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.9	Sociology	4	Exam
OB 1.10	Economic theory	4	Exam
OB 1.11	Materials Science	4	Exam
OB 1.12	Legal culture of personality	4	Exam
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1	Macromolecular Chemistry	4	Exam
OB 2.2	Metrology, Standardization And Certification	4	Exam
OB 2.3	Marketing in the woodworking industry	4	Exam
OB 2.4	Management in the wood-processing enterprises	4	Exam
OB 2.5	Fundamentals of Accounting and Auditing on woodworking enterprises	4	Exam
OB 2.6	Wood composite materials technology	4	Exam
OB 2.7	Technology of structural materials	4	Exam
OB 2.8	Technology Of Wooden House Building	4	Exam
OB 2.9	Protective Treatment Of Wooden Structures	4	Exam

OB 2.10	Modifying of wood and wood-based materials	4	Exam
OB 2.11	Furniture production	8	Exam
OB 2.12	Organization Of woodworking industry	4	Exam
OB 2.13	Technology of manufacturing structural wood elements	4	Exam
<b>The volume of components of the special (professional) training cycle</b>		<b>143</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 23	Academic Practice	16	
CC 24	Production Practice	3	
CC 25	Preparation of Bachelor's Work	4	
CC 26	State Attestation	1	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Descriptive Geometry and Engineering Graphics.** The method of design. Central and parallel projection. The main properties. Surfaces. Classification. Determinant. Line. Fonts. Projection drawings. Sketches and drawings of parts. Straight line crossing above the surface area. Scan of surfaces. The single system of the design documentation. Drawings design. Scales. Formats. Lines. Fonts. Projection drawings. Sketches and drawings of parts.

**Physics.** Mechanics and Dynamics. Kinematics of a point mass. The coordinate system. Movement of solids, deformation of bodies. The oscillatory motion. Molecular physics and thermodynamics. Electricity and magnetism. Optics, the physical nature of light, interference, diffraction, polarization of light.

**Higher mathematics.** Principles of mathematical analysis. The numerical sequence. Derivatives and differentials. Extremum of functions. Differential Equations. Analytic geometry in the plane and in space. Systems of algebraic equations. Matrices and determinants. Fundamentals of probability theory. Multiple correlation.

**Computational Mathematics and Programming.** Introduction. Basic definitions. Hardware. Software. Classification by type of software license. Modern information systems. Document preparation system. Working with documents. Word Processor Word. Working with spreadsheets. The concept of database basics of database management system MS ACCESS. Databases. Data Warehousing. Language SQL. Basics of algorithms. Development of algorithms for solving this problem. The history of the origin and development of programming languages. Basic terms and definitions. Paradigms languages. Object-oriented programming. The programming language Visual Basic 6.

**Chemistry (general and organic).** Theoretical Foundations of Chemistry. Organic Chemistry. Stereometric laws. Structure of atoms, kinetics of chemical reactions. Solutions. Oxidation-reduction reactions. Electrolysis. Corrosion of metals, distinction of major elements chemistry. Classification of organic compounds. The laws and theories of organic chemistry. The main classes of organic compounds, their significance and distribution in nature. Organic constituents of wood, adhesives, resins and other binders.

**Applied Mechanics (strength of materials, engineering).** The objects studied in the discipline of materials strength, their calculation schemes, cross-sectional geometric properties, mechanical properties of materials and the laws of deformation, strength criteria, methods of calculation under static tension, compression, torsion, bending material, methods of calculations under dynamic load and elastic systems fluctuations.

**Principles of Heating Engineering.** The main positions of the technical thermodynamics. Laws of theories of heat and mass exchange, methodology of the heat processes calculation occurring in thermal power installations of the different purposes, principles of operation and design of thermal systems, which are used in woodworking industry, means of the secondary and renewable energy sources use Principles of Automation and AVP. Principles of basic elements of automatic devices work, their advantages and disadvantages, applications. Principles of automatic control systems, management facilities properties.

**Electro Technology and Electric Drive.** The laws of electrical engineering. Modern methods of electromagnetic processes calculation in electrical circuits and devices. Methods of analysis and synthesis of circuits with different parameters of the electricity sources and properties of circles elements.

### Optional components

#### *Optional Block 1 (University Choice)*

Annotations of disciplines, “Philosophy”, “Ukrainian for Professional Purposes”, “Foreign Language (English, German, French, Spanish)”, “Physical Training”, “Labour and Life Safety”.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Wood Science.** Features of the micro-and macroscopic structure of wood. The chemical composition of wood and its use as a chemical raw. Physical and mechanical properties of wood required for the improvement of the existing and creation of new processes. Classifications of wood defects. Classification of forest products and their main characteristics.

**Equipment of the Woodworking.** Basic theories of wood cutting and wood materials, cutting as a workflow of the woodworking machines, wood cutting tools, general information about the hardware of the woodworking enterprises, functional constituent parts and mechanisms of the woodworking machinery, wood cutting machine for general purpose, special equipment of the woodworking industries.

**Technology of the Sawmills and Woodworking Industries.** Cutting-wood productions. Raw materials. Methods, technology and equipment for logs and timber sawing. Warehouses. Timber sorting. Waste recycling. Combination of raw materials use.

**Technology of Wood Drying and Protection.** The discipline studies the problems and stages of the design, the selection of wood drying methods, the selection of equipment for drying, the method for calculation of the performance of the wood drying chambers of the different designs, thermal and aerodynamic calculation of the wood dryers; performance of heat and circulation equipment, planning of the drying shops.

**Ecology.** Theoretical Foundations of Ecology. The doctrine of the biosphere. Ecosystem and biogeocoenosis. Trophic chains. Pollution. Forestry production and its environmental impact. Cost-effectiveness of environmental protection measures.

**Principles Of Automation And AVP.** Principles of the main elements of automatic devices, their advantages and disadvantages, applications. Principles of automatic control systems, properties of control objects.

**Computer Graphics.** The course studies the effective work with documents in MS Word, the practical application of MS Excel spreadsheet (approximation of dependencies, analysis and optimization, linear programming tasks) schemes preparation in Visio system, the use of the statistical software package SPSS.

**The Technology of Wood Products.** Principles of wood products construction taking into the consideration the current requirements of the technical aesthetics, rational consumption of materials and labor force and the technology of their production as a system of rules and methods of wood materials processing into the products based on the modern achievements of science, research and compilation of the best practices. Ways and methods of the technological problems solving at the up-to-date level with the use of research elements. Objectives and methods of products quality management.

**Fundamentals of professional training.** The discipline reveals the peculiarities of studying in higher educational institutions, the students' rights and responsibilities, the rights of the students in the university, the history of the Education and Research Institute of Forestry and Park Gardening and the history of the National University of Life and Environmental Sciences of Ukraine, the internal organization of higher education, the organization of the educational process, the form of educational work in accordance with the educational plan, the hygiene of mental work and the general rules of work with the book and the library. It is emphasized on the traditional features of the certain groups disciplines study that have developed at the institute, the need to study general, general engineering and special disciplines.

**Design of wood products.** Decorating the edges of the walls. Door. Capacity filling of buildings. Shuffle Shelves Support Blocking sections. Fastening of cases and shelves to the wall. Mirrors. Furniture. Computer design and construction of case products. Basic Provisions of the Unified System of Design Documents. Products and their component parts. Types of design documents. Stages of working out of design documentation. Requirements for text documents. Implementation and design of furniture drawings. General requirements for drawings. Drawing dimensions. Development of a technical project. Dimensional drawing. Drawings of a general appearance. Drawings of the general appearance of the product. Specification. Technical description. General design principles. Elements joiner's, constructive: brusks, frames, boxes, shields. Wood as a construction material. Requirements for the design of wood products. Technologicality of products. Joiner connections. Substantive provisions. Frame Angle Connections. Box-terminal connections. Connecting edges. Connection in length. Bond sticker Connection by fasteners Classification of joinery and structural elements. Properties of wood. Requirements for the design of wood products. Technologicality of products. Joiner connections. The basics of interchangeability. System of tolerances and landings. Dimensional chains. Unspecified marginal deviations. Accuracy and interchangeability. Roughness of the surface.

**Designing Woodworking Enterprises.** Scientific basis of design, technological processes design, design of conveyor lines, designing the instrumental, fitter- mechanical and other service shops, the calculation of vehicles; ventilation, heating of wood processing and other shops, forest resources of Ukraine and ways of their use improvement. The tasks of the discipline is the study of the methodological, organizational and scientific bases of industrial buildings design, the bases of technological processes design in the production, composition and volume of the project work, methods of their implementation, composition of the main project-normative documentation, principles of the computer-aided design.

**Technology of Protective and Decorative Coatings.** Varnishes, paints, enamels, prime ground coat, putties. Adhesion and forces of tension. Methods of causing and consolidation of seal coat. Technology and equipment are for finishing of wood. Calculation of the productivity of equipment.

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**Technology of joiner's products.** The task of the discipline is to study the constructions and requirements for various groups of joinery products, their manufacturing technology, the main woodworking equipment used in the manufacture of joiner's products, the study of the directions of rational and integrated use of raw materials and the use of wood substitutes in joinery products.

**Economy of woodworking industry.** Subject, object, method and discipline task; the concept, the mechanism of formation and utilization of fixed and circulating capital. The state and economic analysis of technical equipment and technology. Theory of production, consumption, price, profit, profitability. Markets of resources, capital, labor, and finance. The basic laws of economics and mechanism of action.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines, Sociology, Economic theory, Materials Science, Legal culture of personality see Section 2.1.

#### ***Optional Block 2 (Student's Choice)***

**Macromolecular Chemistry.** The main classes of organic compounds, their significance and distribution in nature. Organic constituents of wood, adhesives, resins and other binders. Relationships between structure, properties and biological functions of organic substances and macromolecular compounds.

**Metrology, Standardization And Certification.** Content of the discipline: quantitative methods for quality assessment and standardization of timber and saw production, wood products, machine tools and equipment, and certification of technological processes in wood processing; product quality management; technical means of measurement; responsibility for non-compliance with standards.

**Marketing in the wood-processing enterprises.** Socio-economic nature of marketing. Formation of the marketing mix. Impact factors of marketing environment on the activity of woodworking companies. Understanding consumer behavior in markets of different types. Marketing research as a basis for making marketing decisions. Functions of marketing. Analytic functions of marketing. Marketing product policy. Pricing. Marketing policy distribution. Marketing promotion policy.

**Management in the wood-processing enterprises.** The concept and nature of management. The history of management. Features managerial activities of woodworking enterprises. Basic theory of managerial decisions. Methods of management decisions. The functions of management and their implementation on woodworking enterprises. Principles and methods of management. Leadership. Fundamentals of human resource management. Ethics and Culture Management.

**Fundamentals of Accounting and Auditing on woodworking enterprises.** The discipline that studies the forms of economic laws at the level of the individual entity. The course involves the study of the functioning of inputs to determine the effectiveness of investments in efficient operation under conditions a market economy, the development of creative approaches to reasoning and management decision-making and analysis of the economic efficiency considering as an example woodworking industry enterprise.

**Wood composite materials technology.** The main task of the discipline is to study the technologies of integrated and rational use of primary and secondary raw materials in the production of glued materials, improving product quality, increasing productivity, reducing the cost of production.

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**Technology of structural materials.** The main task of the discipline is to study raw materials for the production of slabs, requirements for the size and quality of wood particles. An overview of products from chopped wood, features of technology, design of molds. Classification and properties of wood panels.

**Technology of Wooden House Building.** Subject contents: the current status of the wooden constructions production, wooden house building, architectural and planning decision and the design of wooden houses, types of walls, floors and roofs, carpentry in construction, carpentry on the building, the ways of increasing the durability of wood structures, mechanical testing methods, advanced products design and use of wood imitation, preparatory work before the production. The main objective of the discipline is the study of structures and requirements for the different wooden buildings, their production technology, rational and integrated use of raw materials, the study of the basic structural elements the wooden house is made of.

**Modifying Wood and Wood Materials.** Structure, composition, chemical, physical, mechanical and technological properties of modified wood, raw material for the modified wood manufacture. Production and application technology of modified wood.

**Furniture production.** General current state and prospects of development of production of furniture products in Ukraine and abroad. Classification of furniture products. Materials for the manufacture of furniture products. Furniture. Structure of furniture manufacturing technology. Manufacturing and technological process of furniture manufacturing. Typical technological processes for the manufacture of furniture furniture. Calculation of technological process and norms of costs of material and labor resources. Quality of furniture. Indicators and quality control of furniture. Slab and sheet materials cutting. Modern programs for cutting slabs and sheet materials. Equipment for cutting. Laser cutting of wood materials.

**Organization of woodworking industry.** Composition and structure of the woodworking industry. Organization and wages. Organization of wood processing. Planning and funding. Analysis of production.

**Technology of manufacturing structural wood elements.** Chairs and armchairs. Classification and requirements. Basics of Soft Chairs. General information and classification. Chairs installation seats. Fixing seats and backrests. Furniture for sitting and lying. Furniture for sitting and lying, armchairs for rest. Armchairs-beds. Sofas Sofa beds are single and double. Bars of upholstered furniture. Soft spring elements. Soft spring elements are one-sided and two-sided.

## 2.6. FACULTY OF VETERINARY MEDICINE

### **Dean – Mykola I. Tsvilikhovskiy**

Academician of the Ukrainian Academy of Agrarian Sciences, Doctor of Science (Biology), Professor

Tel.: (044) 527-82-31 E-mail: m\_tsvilikhovsky@nubip.edu.ua

Adress: building № 12, room №324 “G”

The faculty organizes and coordinates Bachelor training in the following specialty:

### **211 Veterinary Medicine**

Educational - professional program «**Veterinary Medicine**»

Graduating departments:

Anatomy, histology and pathomorphology animal named after acad. V.G.Kasyanenko

Tel.: (044) 527-86-17. E-mail: museum@nubip.edu.ua

Head of Department – Doctor of Veterinary Sciences, Professor Melnyk Oleg Petrovych

Obstetrics Gynaecology and Animal Reproduction Biotechnology

Tel.: (044) 527-83-46 E-mail: akusherstvo@nubip.edu.ua

Head of Department- Candidate of Veterinary Science, Associate Professor Valchuk Oleksandr Anatoliyovych

Veterinary-sanitary examination

Tel.: (044) 527-88-41 E-mail: vse@nubip.edu.ua

Head of Department - Doctor of Veterinary Sciences, Professor Yakubchak Olga Mykolaivna

Epizootiology and organization of veterinary medicine

Tel.: (044) 527-89-22 E-mail: epizootology@nubip.edu.ua

Head of Department - Doctor of Veterinary Sciences, Professor Nedosekov Vitaliy Volodymyrovych

Parasitology and Tropical Veterinary Medicine

Tel.: (044) 527-83-65 E-mail: parazitologia@nubip.edu.ua

Head of Department - Doctor of Veterinary Sciences, Professor Soroka Natalia Mykhaylivna

Therapy and clinical diagnosis

Tel.: (044) 527-87-92 E-mail: kostenko\_vm@nubip.edu.ua

Head of Department - Candidate of Veterinary Science, Associate Professor Kostenko Vitalii Mykhaylovych

Surgery and pathophysiology named prof. I.O Povazhenka

Tel.: (044) 527-88-68 E-mail: chirurgia@nubip.edu.ua

Head of Department - Doctor of Veterinary Sciences, Associate Professor Malyuk Mykola Oleksiyovych



**Bachelor  
field of knowledge "Veterinary"  
in speciality "VETERINARY MEDICINE"  
Educational - professional program «Veterinary Medicine»**

Form of Training: - full-time studies	Licensed number of persons: 250
Duration of training credits	4 years 240 ECTS
Language of training	English, Ukrainian
Qualification of graduate	Jr. doctor of veterinary medicine

**Concept of training**

According to the standard of education, introduced by the Ministry of Education and Science of Ukraine dated 07.02.2011, № 99 students standard and elective academic disciplines. Graduate receives basic higher education and profession of junior doctor of veterinary medicine, who in production under the guidance of a doctor of veterinary medicine performs veterinary preventive measures that are aimed to prevent disease and death of animals, improve their productivity, quality and safety of animal products, provides preventive and diagnostic measures, treatment of animals, veterinary-sanitary examination slaughter products, ensures compliance of veterinary and sanitary regulations in housing, feeding and reproduction of animals.

**Practical training**

Bases of practical training students are educational, scientific, educational, scientific and industrial laboratories of basic institution of the University (Kyiv), its separate units, especially teaching and research farms of the University ("Velykosnitynske educational and experimental farm named by O. Muzychenko, "Agronomic Research Station," Teaching and Research Farm "Vorzel" Nemishaivo Agricultural College), where laboratory and practical classes, tutorials and practical training of students are kept. In addition, the Department has bilateral agreements with private clinics which deals with small domestic animals, agricultural enterprises of different ownership forms, which are used as a base for practical training.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

Graduates with a degree from the Faculty of Veterinary Medicine junior doctor may be employed in enterprises, institutions and organizations, both state and other forms of ownership where they will carry out work in accordance with the acquired skills.

**Bachelor`s Program and Curriculum  
in Specialty "Veterinary Medicine"  
Educational - professional program "Veterinary Medicine"**

Code n/a	Components of the educational-professional program (educational disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Politology	2	offset
CC 2	Botany	3	offset
CC 3	Zoology	3	offset
CC 4	Latin	2	offset
CC 5	Bioinorganic Chemistry	2	offset
CC 6	Organic Chemistry	2	offset
CC 7	Biophysics	2	offset
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian Statehood	3	exam
OB1.2	Ethnocultural	3	offset
OB 1.3	Philosophy	3	exam
OB 1.4	Ukrainian language for professional purposes	5	exam
OB 1.5	Foreign Language (for professional purposes)	8	exam
OB 1.6	Physical education	2	offset
OB 1.7	Safety of labor and vital activity	2	offset
OB 1.8	The history of Ukrainian culture	3	offset
<b>The volume of components of the general training cycle</b>		<b>45</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Anatomy of domestic animals	8	exam
CC 2	Biochemistry of animals with the basics of physical and colloid chemistry	4	exam
CC 3	Cytology, histology, embryology	5	exam
CC 4	Animal physiology	5	offset
CC 5	Fundamentals of Biosafety, Bioethics	2	offset
CC 6	Veterinary Ecology	2	offset
CC 7	Veterinary Sanitation and Hygiene	2	offset
CC 8	Veterinary Microbiology	3	exam
CC 9	Veterinary Immunology	2	offset
CC 10	Veterinary virology	3	exam
CC 11	Biotechnology in veterinary medicine	2	offset
CC 12	Pathological Physiology	5	exam
CC 13	Obstetrics, Gynaecology and Animal Reproduction Biotechnology	5	exam
CC 14	Veterinary-sanitary examination	4	exam
CC 15	Epizootology and infectious diseases	7	exam
CC 16	General and Special Surgery	6	exam
CC 17	Operative surgery, anesthesiology and topographical anatomy	4	exam
CC 18	Parasitology and invasive disease	6	exam
CC 19	Pathological anatomy and dissection	6	exam
CC 20	Internal diseases of domestic animals	8	exam
CC 21	Veterinary Pharmacology	6	exam
CC 22	Veterinary clinical biochemistry	2	offset
CC 23	Clinical diagnostics animals diseases	6	exam
CC 24	The organization and economics of veterinary affairs	3	exam
CC 25	Veterinary toxicology	3	offset

<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.9	History of Veterinary Medicine	3	offset
OB 1.10	Feeding of animals	4	offset
OB 1.11	Basics of breeding	4	offset
OB 1.12	Veterinary radiobiology	4	offset
OB 1.13	Medicinal Herbs	3	offset
OB 1.14	Professional Ethics	2	offset
OB 1.15	Genetics in Veterinary Medicine	3	offset
OB 1.16	Management and Marketing in Veterinary Medicine	3	offset
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1	Sociology	1	offset
OB 2.2	Economic theory	2	offset
OB 2.3	Science of law	1	offset
OB 2.4	Ukrainian business language and culture of speech	1	offset
OB 2.5	Fundamentals of psychology and pedagogy	1	offset
OB 2.6	Anatomy of exotic animals	2	offset
OB 2.7	Computer science in Veterinary Medicine	2	offset
OB 2.8	Fundamentals of Veterinary Sanitation, Microbiology and Virology	2	offset
OB 2.9	Methods for microbiological studies	2	offset
OB 2.10	Infectious diseases of small animals	4	offset
OB 2.11	Quality and Safety of Agricultural Products	3	offset
OB 2.12	Biotechnology of Animal Reproduction	3	offset
OB 2.13	Surgical diseases of productive animals	4	offset
OB 2.14	Parasitic diseases of productive animals	4	offset
OB 2.15	Fundamentals of judicial Veterinary	4	offset
OB 2.16	Veterinary oncomorphology	4	offset
OB 2.17	Diagnosis and treatment of internal diseases of productive animals	4	offset
OB 2.18	Fundamentals veterinary legislation Ukraine	4	offset
<b>The volume of components of the special (professional) training</b>		<b>168</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 1	Educational practice	<b>16</b>	offset
CC 2	Production practice	<b>9</b>	offset
CC 3	<b>State certification</b>	<b>2</b>	exam
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

### Annotations of disciplines in the curriculum

#### 1. GENERAL TRAINING CYCLE

##### Compulsory components

**Politology.** Politics as a particular social phenomenon, Ukrainian political science, its main and dominant and Ukrainian political thought in general.

**Botany.** Learn plant life, structure, diversity, geographic distribution, environmental cenotic features, biological and economic properties of plants.

**Zoology.** Studies the animal world from the simplest to the chordate animals, patterns of their occurrence and development of animal organisms, body composition, reproduction of different types of certain animals

**Latin.** Latin grammar, spelling rules and specific terms of veterinary medicine.

**Bioinorganic Chemistry.** Chemical structure of matter, the basic theory of chemical processes, complex compounds. Chemistry of inorganic elements and their role in the life of the body, basis of chemical isotopes. Volumetric analysis, acid-base titration, redoksometria, physical and chemical analysis, photometry, chromatography.

**Organic Chemistry.** Structure, methods of production, physical and chemical properties, and use of the major classes of organic compounds - carbohydrates, alcohols, aldehydes, ketones, amines, acids, heterocyclic compounds. Properties of amino acids, carbohydrates, lipids, nucleic acids and proteins.

**Biophysics.** Physical and physico-chemical processes occurring in biological systems, the fundamental phenomena that form the basis of wildlife. Physical characteristics and physical properties of the body farm animals.

### **Optional components** ***Optional Block 1 (University Choice)***

**History of Ukrainian Statehood.** The content of the educational discipline "History of Ukrainian Statehood" is the study of basic stages of formation and development of statehood on the Ukrainian lands, distinctive state building way of the Ukrainian nation. Building of the independent state needs highly skilled, patriotically inclined, socially oriented professionals able to continue the best traditions of the Ukrainians. The response to these circumstances is the study of this discipline in universities. It will allow to master the theoretical course, creatively apply their knowledge in practice and comprehend their own laws of the state building process, orientate in political life and feel their involvement in the state-thousand-year tradition of the Ukrainian people.

**Ethnocultural.** Content «Ethnocultural» due course need comprehensive development of strategic directions of Ukrainian statehood, achieve, the role and place of Ukrainian culture in the context of foreign culture. In the discipline given meaningful information about the origin of Ukrainian, their spiritual culture, economy, life, family. The realization of economic, social and political reforms require an appropriate level of human and national culture. Only through the mind of the individual, because of its high ethical and patriotic feelings may be real change in Ukrainian society.

**Philosophy.** The course introduces the system of knowledge in such fields of philosophy as ontology, gnoseology (theory of cognition), social philosophy, historical types of philosophy that explain the essence of relation "a human-being – the world" in its most important manifestations. The course is characterized by world outlook orientation which allows to synthesize obtained knowledge of special and humanitarian disciplines in integral conception of the world – theoretical basis of university level of specialists training.

**Ukrainian language for professional purposes.** The objective of the discipline is the improvement of the level of general language training, communicative competencies of students, practical mastering in the principles of stylistics of Ukrainian language that will provide professional communication at proper language level. The discipline is aimed at generalization and systematization of the knowledge in Ukrainian language, to form abilities and skills for optimal language behavior in professional sphere.

**Foreign Language (for professional purposes).** A comprehensive study of language activities (reading, listening, speaking). Learn how to communicate and translate.

**Physical education.** The aim of the discipline is formation of physical culture of junior specialist and the ability to realize it in social and professional training and in family life. The objectives of the discipline are to improve students' health and develop physical abilities in accordance with the professional activity of a future specialist.

**Safety of labor and vital activity.** The aim of study of the discipline that combines such disciplines as «The fundamentals of labor protection» and «Safety of vital activity» is to obtain skills and knowledge for realization of effective professional activity providing optimal control of labor protection at enterprises, to form in students responsibility for

personal and collective safety considering risk of anthropogenic emergencies, nature disasters and industrial accidents.

**The history of Ukrainian culture.** Ukrainian mental culture as part of the global cultural process. The role of culture in the formation of identity in the lives of the Ukrainian people. Objective and subjective factors of growth of cultural norms at the present stage of Ukraine.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Anatomy of domestic animals.** The structure of the body of animals exists in close connection with its functions. The machine movement. Osteology. Syndesmology. Myology. Overall cover. Splanchnology. Digestive apparatus. Breathing apparatus. Urogenital. Angiology. Endocrine glands. The nervous system. Senses. Features of the anatomy of poultry.

**Biochemistry of animals with the basics of physical and colloid chemistry.** Physical and chemical properties of organic compounds and solutions. Structure, function and metabolism of proteins, fats, carbohydrates, amino acids, nucleic acids, vitamins, enzymes, macro- and micronutrients that constitute the basis of the structure of body tissues. Biochemical processes underlying the functional activity of certain organs and systems.

**Cytology, histology, embryology.** Study of the cell. General embryology. Study of tissues. Histology of organs and systems.

**Animal physiology.** Physiological processes in animals, including the physiology of blood, lymph, heart and circulatory, physiology of respiration, digestion, metabolism and energy, thermoregulation, excretion, endocrine physiology, reproduction, lactation, muscular and nervous systems, higher nervous activity analyzers.

**Fundamentals of Biosafety, Bioethics.** Examines the terms of use of laboratory animals in veterinary medicine, measures to prevent the spread of infectious and parasitic diseases, the rules of work with particularly dangerous infections.

**Veterinary Ecology.** Fundamental properties (functions) of life. The body and the environment. Patterns of development, and the existence of the biosphere. Circulation of matter and energy in the biosphere. The structure of modern ecology.

**Veterinary Sanitation and Hygiene.** Learn sanitary and veterinary-sanitary requirements for environmental factors, livestock buildings, feed, water, soil, air and hygiene regulations and requirements for housing, feeding and maintenance of various types and age-sex groups of animals.

**Veterinary Microbiology.** Systematics, morphology and physiology of microorganisms spread in nature, their role in the transformation of matter in nature. The impact of environmental factors on microorganisms. Infection. Immunology. Types and features of pathogens: bacteria, bacilli, fuzibacteria and actinomycetes, mycobacteria, vibrio, spirochetes, mycoplasmas, rickettsia and chlamydia, microscopic fungi.

**Veterinary Immunology.** Examines the central and peripheral organs of the immune system, mechanisms of immune responses, antibodies and antigens. Immunological diagnosis of infectious diseases. Serological diagnosis of disease response.

**Veterinary virology.** Physical structure and chemical composition of vibrios and viruses. Taxonomy, reproduction and cultivation of viruses. Effects on viruses of physical and chemical factors. Ecology of viruses. Genetics of viruses. Pathogenesis of viral diseases of animals. Features of antiviral immunity. Specific diagnosis and prevention of viral diseases of animals.

**Biotechnology in veterinary medicine.** Genetic and cellular engineering, Immunobiotechnology, Applied Biochemistry, Enzymology engineering, industrial engineering or microbiology. Transplantation of embryos, early identification and regulation of gender of animals, cloning and transgenic reception, monozygotic and chimeric animals. Hybridoma technologies for monoclonal antibodies and their usage.

**Pathological Physiology.** General patterns of emergence, development and completion of the disease. Nosology. Role of reactivity in pathology. Characteristics, classification of typical pathological processes; inflammation, dysplasia tissue disorders typical regional blood flow, metabolism, acid-base balance, thermoregulation; hypoxia, starvation. Adaptive-compensatory reactions in animals aimed at eliminating violations. Pathological physiology of organs and systems.

**Obstetrics, Gynaecology and Biotechnology Animals Reproduction.** Physiological basis and technique of obtaining sperm. Physiology and biochemistry of semen. The technology of artificial insemination of females and embryo transfer. Andrology. Physiology and Pathology of pregnancy, birth and the postpartum period. Operative Obstetrics. Obstetrical and gynecological check-ups. Diseases of the newborn. Diseases of the breast. Gynecology. Female and male infertility.

**Veterinary-sanitary examination.** The rules and methods of Veterinary evaluation of animal origin and foundation of technology and standardization of their production. Examination of slaughter products of healthy and sick animals, food poisoning and toxicity. The basic technology and hygiene of preserving, hygiene of production, veterinary and sanitary examination of eggs, milk and milk products, meat of wild animals, wildfowl, fish and marine mammals . Veterinary-sanitary inspection of food in the markets.

**Epizootology and infectious diseases.** Infection and Immunity. Evolution and classification of infectious animal diseases. Treatment and prevention of infectious diseases of ruminants, pigs, horses, birds, chicks, dogs and fur animals, bees and fish. Veterinary Sanitation. Diseases common to several species of animals and people.

**General and Special Surgery.** Veterinary traumatology. Surgical infection. Diseases of the skin, muscles, tendons, tendon sheaths and bursa, blood vessels, joints ,injuries of nerves and brain. Tumors. Diseases in the area of the head, neck, withers, back, and chest wall, abdomen, pelvis and tail. Andrologic disease. Veterinary Orthopedics.

**Operative surgery, anesthesiology and topographical anatomy.** The doctrine of surgery due to topographic and anatomical features of certain parts of the body of animals. Anesthesiology, fixation, and the overthrow of drug reassurance. Technology and organization of mass operations. Prevention of infections in the work of doctor of veterinary medicine. Injection and puncture. Desmurgy. Surgical operations on the parts of bodies of animals.

**Parasitology and invasive diseases.** The emergence, development and extinction of invasive animal diseases. General parasitology. Veterinary Helminthology, Entomology, arachnology, protozoology.

**Pathological anatomy and dissection.** General patanatomy. Death and posthumous changes. Compensatory and recovery processes. Inflammation. Immunomorphology and immunopathology. Special pathological anatomy, diseases of the respiratory, digestive, cardiovascular, genitourinary and nervous systems. Diseases of the skin. Pathomorphology of infectious diseases. Sectional course. Forensic veterinary examination. Procession part. Special part.

**Internal diseases of domestic animals.** Internal diseases of farm animals, their etiology, pathogenesis, symptoms, course, diagnosis, treatment and prevention; laboratory studies. Diseases of the young animals. Diseases of poultry. Diseases of fur-bearing animals, rabbits and dogs.

**Veterinary Pharmacology.** Pharmacodynamics of drugs. Conditions affecting on the action of drugs. Key features and pharmacokinetic characteristics of different groups of drugs, their dosage. Compounding technology and formulations.

**Veterinary clinical biochemistry.** Using of variety of biochemical methods for the study clinical conditions of animals, especially of their use in the study of certain organs and systems to determine exact diagnosis and development of treatment and prevention of diseases. Biochemical tests and symptoms (syndromes) metabolic disorders and other animal diseases.

**Clinical diagnostics animals diseases.** Methods and peculiarities of the clinical studies of various animals, their use in the study of individual organs and systems, symptoms, syndromes and main stages of recognition of the disease. Special methods of research the conditions of separate organs and systems, detection of diseases in animals.

**The organization and economics of veterinary affairs.** Legislation on veterinary medicine in Ukraine. Organization and logistics of veterinary services and veterinary checks in regions, cities and farms. Planning, organization and economics of veterinary measures. Veterinary accounting, reporting and record keeping. The international veterinary organizations and veterinary services in some foreign countries.

**Veterinary toxicology.** Toxicology of mineral poisons, phosphorus and chlororganic compounds. Organic derivatives of mercury. Toxicology of phenoloksyacids and phenol. Toxicology of poisonous substances vegetable and animal origin. Poisoning by poor quality animal feed. Chemical and toxicological analysis.

### **Optional components** ***Optional Block 1 (University Choice)***

**History of Veterinary Medicine.** History of Veterinary in the primitive community, in Kievan Rus` principalities IX-XIV century, in Russia XVI11 and XIX century. History of veterinary medicine in the USSR. The current state of veterinary medicine in Ukraine.

**Feeding of animals.** Scientific basis of feeding farm animals, feed and nutritional evaluation the needs of animals in the factors of complete feeding. The physiological significance of individual nutrients feedstuff and usefulness of the concept of nutrition, assessment of nutritional feed and rations.

**Basics of breeding.** Breeding farm animals. Livestock. Pig. Sheep. Poultry. Equine.

**Veterinary radiobiology.** Biological effects of ionizing radiation. Radiation injury of animals. Radioecology and toxicology of radioactive substances. Radiological and veterinary-sanitary examination of objects under veterinary supervision. The use of ionizing radiation in animal husbandry and veterinary medicine.

**Medicinal Herbs.** The flora of the planet and Ukraine, medicinal and poisonous flora; Collecting and harvesting of medicinal plant raw materials, processing technology and processing, chemical composition, pharmacological action, purpose, dosage forms, dosage, indications and contraindications for use.

**Professional Ethics.** Morality and ethics. Functions of morality in the development of personality doctor of veterinary medicine. Deontology. Universal values and moral code veterinarian by supreme moral values. Laws of Ukraine and International Law on the basics of Professional Ethics doctor of veterinary medicine.

**Genetics in Veterinary Medicine.** Studies the the basics of heredity and variation in organisms, reveals the principles of storage, transmission and realization of genetic information, including cytological and molecular basis of heredity, the laws of inheritance, characteristics (disability, illness), linked inheritance, basic genetic engineering, population and clean lines, basic immunogenetics.

**Management and Marketing in Veterinary Medicine.** Business plan: preparation and execution. The organization of the enterprise. Marketing operations.

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**Optional Block 2 (Student's Choice)**

**Sociology.** Explore the society as a complete system, social institutions, and community groups, social causes of individual and mass behavior, the processes of human social relations.

**Economic theory.** The content of the basic laws and categories of economic theory, characteristics of the market economy and solving the problems of its creation in Ukraine of the positive experience of the market economy in developed countries.

**Science of law.** Patterns of State and Law, certain areas of legislation Ukraine. Description of the constitutional, labor, environmental, land, civil, administrative, criminal and family law.

**Ukrainian business language and culture of speech.** Preparing students for oral and written business communication, which involves working with different kinds of scientific and business documents. Working with special lyrics by profession.

**Fundamentals of psychology and pedagogy.** Provides psycho-pedagogical training of future professionals that will enhance overall psychological and pedagogical culture, a cohesive idea of the psychological characteristics of man as a factor in the success of its operations, the ability to think independently and to foresee the consequences of their actions.

**Anatomy of exotic animals.** Studies the of the structure of organs and systems of the exotic animals in conjunction of their structure and functions, and their development during ontogenesis and phylogenesis.

**Computer science in Veterinary Medicine.** The main goal of discipline is to master modern information computer technologies used in veterinary medicine to highlight the research results with sufficient validity and clarity.

**Fundamentals of veterinary sanitation, microbiology and virology.** Teaches evaluate microbes that are in the environment, studies microbiological parameters hygienic regulation, methods for monitoring the disinfection of objects of the environment as well as identify infectious animal diseases of bacterial and viral etiology.

**Methods for microbiological studies.** Studies the modern laboratory methods for detecting and identifying bacteria, viruses and fungi on animal health and pathology, quality and safety.

**Infectious diseases of small animals.** Studies the diseases that cause significant changes in animal organisms and lead to decrease of physiological and working skills of small animals, and not seldom causes death. The study of this subject will enable students to gain knowledge of methods of diagnosis of the disease at any stage of its development, planning and timely laboratory diagnosis using modern methods, devices and methods, development, providing and monitoring of sanitation in farms of different ownership forms, at the objects of the environment, and prediction of diseases.

**Quality and safety of agricultural products.** Rules and methods of veterinary-sanitary assessment of products of animal origin and basis of technology and standardization of their production. Examination of products of slaughter of healthy and sick animals, food poisoning and toxicity. Fundamentals of technology and production hygiene, veterinary-sanitary examination of eggs, milk and milk products, meat, fish and animals. Veterinary-sanitary inspection of food in the markets.

**Biotechnology of Animal Reproduction.** To form for a future doctor of veterinary medicine knowledge and skills in the physiology of animal reproduction, modern methods of identifying the optimal time of insemination, methods of obtaining semen from bulls and their evaluation insemination of females. Use and implementation of new directions of animal biotechnology (embryo transfer, sexing semen) in cattle.



**Surgical diseases of productive animals.** Studies surgical disease patterns of development and the general principles of treatment based on localization of pathological process in farm animals.

**Parasitic diseases of productive animals.** Studies localization of agents in animals, dissemination, ways of infection and factors of transmission of agents, pathogenesis of invasive disease in farm animals, principles of laboratory diagnostics and prevention and combating invasive diseases of farm animals.

**Fundamentals of judicial Veterinary.** Examines the complex issues related to the legal framework of a doctor of veterinary medicine. Covers the basics of the legal framework of Ukraine, peculiarities of forensic veterinary examination in case of death of animals from different reasons.

**Veterinary oncomorphology.** Studies cell morphology tumor pathology, its structure, mechanisms of cooperation and breach of metabolic and functional mechanisms.

**Diagnosis and treatment of internal diseases of productive animals.** Examines clinical, instrumental and laboratory techniques for sick farm animals and causes, mechanisms of development, clinical and morphological manifestation, course and treatment of internal diseases.

**Principles of veterinary legislation Ukraine.** The course examines the theoretical and practical foundations of legal and legislative activity in the field of veterinary medicine. Considering the law as "the laws of social nature, embodied in legislation", this discipline manifests the importance of a legal activity in the field of veterinary medicine. Study of legally significant, legally regulated actions and operations aimed at meeting the public and private interests in the veterinary field.

## **2.7. FACULTY OF ALIMENTARY TECHNOLOGIES AND MANAGING BY QUALITY OF PRODUCTS OF AGRICULTURAL COMPLEX**

**Dean** – doctor of sciences, professor **Bal-Prylypko Larissa Vatslavivna**

Phone: (044) 527-89-50, E-mail: [bplv@mail.ru](mailto:bplv@mail.ru)

Location: training housing # 12, rooms 305 and 306

The faculty organizes and coordinates the process of training of bachelors by specialty:

### ***181 Food Technologies***

Educational-professional Program «**Food Technologies**»

Graduating department:

Technology of meat and fish products, and of sea foods

Phone: (044) 527- 88-85, E- mail: [slob2210@ukr.net](mailto:slob2210@ukr.net)

Head of the chair – doctor of biological sciences, professor Derevianko Liudmila Petrivna

**Bachelor**  
**Field of knowledge of “Manufacturing and technologies”**  
**in Specialty “FOOD TECHNOLOGIES”**  
**Educational-professional Program «Food Technologies»**

Form of training:	Licensed number of persons:
– daytime	100
– extramural	100
Term of training	3 years and 10 months
Credits	240 ECTS
Language used in training	Ukrainian, English
Qualification of graduates	engineer-technologists

**Concept of training**

The successful practical realization of solutions used in realization of important for Ukraine problems of reprocessing of raw materials for producing of foodstuffs is possible in training of engineers-technologists of level of education of “Bachelor” by specialty of “Alimentary technologies”. The factors that define the problems to be solved in training of experts by specialty of “Alimentary technologies” are: increasing of output of high-quality traditional and innovative foods, development and introduction of intense technologies in use of results of fundamental research in sphere of biotechnology, realization of modern technical and technological solutions. The causes of studying of said problems are those that the modern processes of development of native and foreign industry are formed on base of functioning of enterprises that operate in sphere of biotechnical industry character by the closed cycle of manufacturing. The principal peculiarities of processes they use are realization of principle of purposeful reprocessing of food raw materials in concrete foodstuffs and specific mounting of technological equipment in their production.

**Practical training**

TOV “Globinskii meat-packing factory» Poltava region, STOV «Agricultural firm KUibyshevo» Poltava region, TOV «Agricultural firm Stolichnaya» Kyiv region, TOV «Kovin’ko-kovbasy», Vinnitsa region, TOV «Cherkas’ka prodovolcha kompaniia», city of Cherkasy, PP «Gaisynmiasokombinat» Vinnitsa region., «O. Muzychenko «Velykosnityns’ke NDG», PAT «Koziatynskii miasokombinat», Vinnitsa province., TOV «Lityns’kii miasokombinat», Vinnitsa region, TOV «Polis», Kyiv region., TOV «Boyarski kovbasy» Kyiv region, VAT «Ochakivskii rybokonservnyi kombinat», Mykolaiv region, TOV «Rybni promyslovi tekhnologiji», city of Zhitomir, ZAT «Chernigivs’ke pidpryyemstvo po pererobtsi ta realizatsiji rybnykh tovariv «Chernigivryba», city of Chernigiv, TOV «Rybkoopprodukt», village of Pinchuki, Kyiv region.

**Proposed Topics for Bachelor theses**

1. Project of meat and fat producing complex of productivity of 23 tons of meat per shift including 30 % of porcine meat in skin and 70 % of beef.
2. Project of workshop of productive capacity of 2.5 tons of sausages per shift including 10 % of small sausages.
3. Project of industrial complex by producing of 28 tons of meat of birds per shift, including 50 % of hen and 50 % of broilers.

4. Project of workshop by producing of semi-finished meat products of productive capacity of 7.0 tons of finished products per shift, including 40 % of production packed in paste case.

5. Project of workshop by production of dried fish.

6. Project of workshop by producing of frozen fish.

7. Project of workshop by producing of preserved fish in small packing.

8. Project of workshop by producing of canned fish made of raw materials taken from the Black and Azov seas.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

As provides the branch standard of higher education of Ukraine, the graduate obtains after finishing of training the qualification of engineer-technologist. The specialists are capable to carry out the work at certain positions by specialty accordingly to norms of the State classifier of professions of DK 003-96. The main sphere of their activities is work at industrial enterprises of meat- and fish industries, as well as at enterprises and firms of all forms of property that operate at conjugated spheres of activities. The principal types of their operation is carrying out of organizational, managing, industrial, pedagogical, projecting and R&D works in spheres of investigation of novel and betterment of existing technologies of producing of meat and meat products, and fish and fish products. After obtaining of the necessary qualification, graduates can work at enterprises of food and reprocessing enterprises of agricultural sphere of economy.

**Bachelor`s Program and Curriculum  
in Specialty «Food technologies»  
Educational-professional Program «Food Technologies»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Higher mathematics	7,0	examination
CC 2	Chemicalbaseofalimentary technologies, including:	23,0	test
CC 2.1	General and inorganic chemistry	6,0	examination
CC 2.2	Analytical chemistry	5,0	test
CC 2.3	Organic chemistry	6,0	Examination
CC 2.4	Physical and colloid chemistry	6,0	examination
CC 3	Engineering and computer' graphics	7,0	test
CC 4	Physics	5,0	examination
CC 5	Biochemistry	6,0	examination
CC 6	Heat engineering	3,0	test
CC 7	Electric engineering	3,0	test
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukraine	3,0	examination
OB 1.2	Ukrainianlanguage (by profession)	4,0	examination
OB 1.3	History of Ukrainian culture	3,0	test
OB 1.4	Foreign language	5,0	examination
OB 1.5	Jurisprudence	3,0	test
OB 1.6	Philosophy	4,0	examination
OB 1.7	Fundamentals of religion	3,0	test
OB 1.8	Fundamentals of psychology	3,0	test
OB 1.9	Physical training	4,0	test
<b>The volume of components of the general training cycle</b>		<b>86,0</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Processes and apparatus used in alimentary technologies	9,0	examination
CC 2	Technical microbiology	3,0	examination
CC 3	Generalized technologies used in industry by producing of alimentary production	17,0	examination
CC 4	Information technologies used in engineering calculations in the branch-industry	6,0	test
CC 5	Technology of producing of polysaccharides and their use in food industry	3,0	test
CC 6	Automation of process of manufacturing	3,0	examination
CC 7	Safety of work and life	4,0	test
CC 8	Technological equipment used in the branch-industry	5,0	examination
CC 9	Standardization, metrology, certification and quality management	5,0	test
CC 10	R&D work of students	4,0	test
CC 11	Economy of enterprises	3,0	examination
CC 12	Theoretical base of alimentary technologies	3,0	test
CC 13	Fundamental principles of mechanics and reliability of equipment used in the branch-industry	3,0	examination
CC 14	Applied mechanics	4,0	examination
CC 15	Informatics and information policy	3,0	test
CC 16	Technology of producing of sanitary foodstuffs	3,0	test
CC 17	Material science	3,0	test

<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Education in universities	3,0	test
OB 1.2	Ethics and culture of nutrition	3,0	test
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1	Political science and fundamentals of sociology	3,0	test
OB 2.2	Fundamentals of animal husbandry	4,0	test
OB 2.3	Fundamentals of physiology and hygiene of nutrition	3,0	test
OB 2.4	Hygiene and sanitary at enterprises that produce foods	3,0	test
OB 2.5	Management at enterprises of the branch-industry and fundamentals of business undertakings	3,0	test
OB 2.6	Fundamentals of construction in industry	3,0	test
OB 2.7	Physicochemical and technical base of processes of refrigeration	3,0	test
OB 2.8	Technological calculations and accounting in the branch-industry	3,0	test
OB 2.9	Industrial ecology of reprocessing enterprises	3,5	test
OB 2.10	Control of quality and safety of production of branch-industry	3,5	test
OB 2.11	Physicochemical and biochemical processes of reprocessing of meat	4,0	examination
OB 2.12	Technologies used in the branch-industry	13,0	examination
OB 2.13	Biochemistry of meat and meat products	3,0	test
OB 2.14	Projecting of enterprises of meat-processing industry	3,0	examination
OB 2.15	Microbiology of meat and meat products	3,0	test
OB 2.16	Physicochemical and biochemical works by reprocessing of fish and seafood	4,0	examination
OB 2.17	Biochemistry of fish and seafood	3,0	test
OB 2.18	Projecting of enterprises of fish-processing industry	3,0	examination
OB 2.19	Microbiology of fish and seafood	3,0	test
<b>The volume of components of the special (professional) training cycle</b>		<b>145</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 3.1	Work experience courses	3,0	test
CC 3.2	Practical training	3,0	examination
CC 3.3	Preparation of bachelor' diploma (project)	3,0	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Higher mathematics.** Determinants and systems of equations, functions, derivatives, methods of integration, differential equations of first order and upper orders, systems of differential equations, use of differential calculus in studying of functions and plotting of graphs.

**General and inorganic chemistry.** Structure of matter, types of chemical bonds, general regularities of passing of chemical processes, electrolytic dissociation and hydrolysis, oxidative and reducing equations, basic properties of chemical elements and their compounds.

**Analytical chemistry.** Gravimetric analysis, titrimetric analysis (acid-base interaction, methods of precipitation and forming of complexes), electrometric method, conductometry, polarography and amperometry, emission spectrometric analysis, luminescence.

**Organic chemistry.** Albumens, amino acids, enzymes, lipids, carboxylic (nutritional) acids, hydrocarbons, properties of organic compounds.

**Physical and colloid chemistry.** Chemical equilibrium, equilibrium of phases, chemical kinetics and catalysis, solutions of electrolytes, electrochemical processes and electromotive forces, structure of molecule, molecular spectra, intermolecular interaction, molecularly-kinetic and optical properties of disperse systems, surface effects and adsorption, emulsions and foams, aerosols, structure and properties of high-molecular compounds.

**Engineering and computer graphics.** Methods of projection, curve lines on surface, their practical use in constructing of technological equipment, machine graphics, use of computers in projecting and constructional work.

**Physics.** Physical foundations of mechanics, fundamentals of molecular physics and thermodynamics, direct electrical current, electromagnetism, electromagnetic oscillations and waves.

**Biochemistry.** Interrelation of processes of metabolism in organisms; biochemical processes occurred in storage and reprocessing of food raw materials; types of fermentation (alcoholic, propionic-acid, amylic), generalized regularities of metabolism, energetic metabolism.

**Informatics and information technologies.** Technical and programmatic means of realization of informative processes, algorithmization and programming, software and computer graphics, use of system of "Internet".

**Heat engineering.** Heat-exchanging apparatus, boiler installations, systems of supply of heat to enterprises, which produce foods, protection of environment.

**Electric engineering.** Electric machines, transformers, electric lighting, supply of energy to enterprises that produce foods, saving of electric energy.

**Optional components**  
**Optional Block 1 (University Choice)**

Annotations of disciplines "History of Ukrainian Statehood", "Ethnocultural", "Philosophy", "Ukrainian for Professional Purposes", "Foreign Language (English, German, French, Spanish)", "Physical Training", "Labour and Life Safety", "Legal Personal Culture" see Section 2.1.

**2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**  
**Compulsory components**

**Processes and apparatus used in alimentary technologies.** Constructions and basic characteristics of modern equipment of enterprises that produce foods, technological processes and parameters, which are used in producing of various types of foodstuffs.

**Technical microbiology.** Interrelations of microorganisms among themselves and with other organisms, genetics and ecology of microorganisms, microbiological processes occurred in process of storage and reprocessing of food raw materials, control of microbiological, sanitary and hygienic conditions of manufactures.

**Generalized technologies used in industry by producing of alimentary production.** Assortment of foodstuffs, level of development and tendencies of progress of branches of economy in Ukraine and abroad. Composition, properties and quality of vegetative and zoic raw materials used in alimentary technologies. Advanced technological schemes used in the food industry. Complex schemes of reprocessing of raw materials in food industry. Efficient use of secondary raw materials.

**Information technologies used in engineering calculations in the branch-industry.** Theoretical and practical training of students by use of information and investigatory complex of data used in alimentary technologies and organization of access to modern informative resources, giving of knowledge on effective means and methods of development, storage, processing and transmission of information.

**Technology of producing of polysaccharides and their use in food industry.** Information of general character, nomenclature of polysaccharides. Classification of food additives of group of polysaccharides. Use of polysaccharides in food industry. Study of influence of polysaccharides on organisms of men.

**Automation of processes of manufacturing.** Technological processes of food industry subjected to automation, automated systems of operation by technological processes, elements of projecting of systems of automation of alimentary technologies, use and servicing of computerized systems of servicing of enterprises, which produce foods.

**Technology of producing of sanitary foodstuffs.** General characteristic and classification of foodstuffs, characteristics of basic functional ingredients and principles of development of functional foodstuffs.

**Technological equipment used in the branch-industry.** Principle of development of modern equipment to be used in the branch-industry. Rational methods of exploitation of the advanced equipment used in the branch-industry. Basic directions of progress of processes of mechanization and automation of technological lines.

**Standardization, metrology, certification and quality management.** Types of standards, procedures of their development and revision. State supervision and legal problems of standardization. Quality of production, control of work in ensuring of its proper



quality. Certification. metrological service of the enterprise. Notions of measurement and means of measurement.

**R&D works of students.** Theoretical investigations and their experiments verification, factorial experiment, operation in processing of data by methods of mathematical statistics, basic knowledge on patent law, computerization of process of development of technical solutions.

**Economy of enterprises.** General characteristic of economy of food industry. Fixed funds of manufactures. Amortization of fixed manufacturing funds. Circulating assets of food industry enterprises.

**Theoretical base of alimentary technologies.** Basic concepts of technologies, procedures of their choose, as well as theoretical bases and regularities used in accomplishing of technological processes of food industry; theoretical base of processes of mechanical treatment of food raw materials,; physicochemical processes put in base of food technologies and theoretical base of work in thermal treating of food raw materials.

**Fundamental principles of mechanics and reliability of equipment used in the branch-industry.** Generalized principles of projecting of technical and technological schemes that should have the specified level of reliability. Investigation of wearing of technological environments in process of their exploitation and identification of longevity of servicing of details of technological equipment. Choose of constructive materials to be used for assuring of the specified level of reliability of operation of machines and apparatus in producing of foodstuffs.

**Material science.** Physicochemical and technical characteristics of materials, classification and specific features of materials.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

**Education in universities.** Basic directions of activities of bachelors specialized in work at enterprises that produce foods, general concepts and information on engineering processes and development of food-producing enterprises, data on kinds of scientific information, types and kinds of editions, role of libraries in storage and search for information.

**Ethics and culture of nutrition.** Nutritional base of mankind in history and now, stages of formation and progress of culture of nutrition worldwide and in Ukraine, causes of origination of events of crisis in alimentation and methods of their overcoming during the history of men's civilizations, general principles of progress of alimentary technologies and culture of consumption of foodstuffs.

#### ***Optional Block 2 (Student's Choice)***

**Political science and fundamentals of sociology.** Formation of knowledge (basic stages of formation and progress of psychology of personality; methods used in its development, inter personal relations, processes occurred in groups, basic problems, concepts, social and psychological phenomenon.

**Fundamentals of animal husbandry.** Types of species, biology, methods of natural and artificial reproducing of animals, feeding and breeding of animals, basic technological processes of manufacture of products of husbandry.

**Fundamentals of physiology and hygiene of nutrition.** Fundamentals of theory of nutrition, hygienic characteristic of various foodstuffs, food additives, methods of

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development of conditions of safety of foodstuffs that are of high nutritional and biological value.

**Hygiene and sanitary at enterprises that produce foods.** The training program presumes studying of fundamental problems of sanitary and hygiene to be observed at enterprises that produce foods, as well as observance of established conditions of safety in manufacturing premises, at workshops and lines, as well as of norms of personal hygiene of personnel of the enterprise. There are considered also the problems of use apparatus of sanitary treatment of equipment and premises, as well as detailing of properties of detergents and disinfectants used in it.

**Management of enterprises of the branch-industry and fundamentals of business undertakings.** Organization principles of functioning of enterprises. Planning and organization of operation of the main manufacture. Principles of scientific organization of labor. Normalization and organization of system of remuneration of personnel for their work. Organization of material and technical servicing of manufacture.

**Fundamentals of construction in industry.** Fundamental principles of construction in industry, planning of productive areas and fundamentals of sanitary technique.

**Physicochemical and technical base of processes of refrigeration.** Principles of operation of modern refrigerating equipment used in the branch-industry, its rational use and methods of advancement of processes of mechanization and automation of refrigerating technological lines.

**Technological calculations and accounting in the branch-industry.** Calculation of quantities of basic raw materials and auxiliary materials to be used in producing of finished products, calculation of their prospective output. Choose of basic technological equipment, which would operate under the guidance of computerized means of control. Use of taken knowledge in conditions of optimization of realized processes of manufacturing; rational technological solutions; analysis of current situations at manufactures.

**Industrial ecology of reprocessing enterprises.** Ecological state of enterprises that produce foods and the foodstuffs proper, energetics and ecology, monitoring of environment, sources of pollution and classification of pollutants of biosphere, environmental norms, protection of aerial environment, water resources and biosphere.

**Control of quality and safety of production of the branch-industry.** Inventory of raw materials in its accepting. Control of quality of raw materials in its acceptance for reprocessing, control of quality of finished products. Identification of loss of raw materials in processes of their transportation and preliminary treatment. Identification of mass parts of water, dry substances, pH, mineral substances, albumens, fats, hydrocarbons, vitamins pectin etc. in raw materials, semi-finished and finished products.

**Merchandising and packing of foodstuffs.** Practice and methods of evaluation of quality, forecasting of level of integrity and guarantees of safety of consumption of foodstuffs. Categorical apparatus of merchandising, its terms and definitions, nomenclature of indices of quality of new types of foodstuffs and their unification by observance of clauses of normative documents of international category.

**Physicochemical and biochemical processes of reprocessing of meat.** Biochemical and physicochemical processes occurred in processes of storage and reprocessing of meat, interrelations of microorganisms amongst themselves and with other organisms in storage of finished products, generalized regularities of metabolism, energetic exchange.

**Technologies used in the branch industry.** Structure of the branch-industry. Assortment of products of the branch-industry. Nutritional value and properties of products in their consumption, their organoleptic and physicochemical indices of quality. Technology of producing of products of preliminary and finishing reprocessing of raw materials used in

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the branch-industry. Complex reprocessing of raw materials used in the branch-industry. Advanced methods of fabrication of foodstuffs. Imperfections of products, causes of their origination and methods of prevention of their repeated appearance.

**Biochemistry of meat and meat products.** Identification of chemical composition of muscular and other tissues, which form meat of various kinds of domestic animals and birds; studying of biochemical processes that occur in live and slaughtered animals (in process of after ripening of meat and in process of its deterioration), identifying of their influence on passing of processes of producing of high-quality products; studying of biochemical indices of quality of meat and meat products, as well as identification of influence on their quality of various factors (quality of fattening, conditions of keeping, season, sex, physiological conditions of animals, conditions of environment etc.).

**Projecting of enterprises of meat-processing industry.** Studying by students of methods of projecting, carrying out of calculation of technological parameters of enterprises and their graphical representation in process of projecting of technological lines used in meat-processing industry.

**Microbiology of meat and meat products.** Role of microorganisms in various processes of reprocessing and storage of meat raw materials; acquiring of practical experience in indication and identification of microorganisms, which vital activity influences on indices of quality and safety of meat and meat products; studying of etiology of ripening of meat and meat products; studying of systematic of prophylactic measures to be taken for prevention of occurrence of food poisoning and inflectional diseases of men caused by consumption of rotten meat and meat products.

**Physicochemical and biochemical works by reprocessing of fish and seafood.** Physicochemical and biochemical processes occurred in raw materials and products in process of their salting, freezing, thermal treatment, smoking, drying and new methods of technological treatment that have the purpose of reaching of optimum conditions of producing, forming of functional properties of raw materials and quality of finished products.

**Technologies used in the branch-industry.** Theoretical and practical problems arisen in realization of processes of reprocessing of fish, backboneless and other hydrobiontes; acquirement by students by knowledge of chemical composition, biological and energetic value of fish and seafood, basic technologies of their reprocessing, reasoning of decisions taken in development of related technologies, choose of methods of carrying out of technological operations and calculation of parameters of processes of manufacturing.

**Biochemistry of fish and seafood.** Biochemical processes occurred in tissues and organs of fish during its life, during the post mortal period and in process of its reprocessing; acquainting with chemical methods of identification of level of quality and freshness of fish and seafood.

**Projecting of enterprises of fish-processing industry.** The program of training presumes studying of theoretical and practical problems that arise in process of realization of typical processes of storage, preservation and reprocessing of fish, use of elements of the system of automated projecting of fish-processing enterprises, technological projects of manufactures of fish and seafood; technological projects of enterprises by producing of fish products; accounting and graphical chapters of works by projecting of related enterprises.

**Microbiology of fish and seafood.** Studying of morphology and physiology of basic groups of microorganisms, which vital activity influences on quality of fish and seafood; causes of deterioration of quality of fish and seafood; studying of the system of prophylactic measures to be taken for prevention of occurrence of food poisoning and inflectional diseases of men caused by consumption of rotten fish and seafood.

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## 2.8. FACULTY OF MECHANICS - TECHNOLOGY

**Dean** - Associate Professor **Yaroslav Mykhaylovich**

Tel .: (044) 527-85-34 E-mail : mtf11k@ukr.net

Location: educational building number 11, room. 309

The faculty organizes and coordinates Bachelor training in the following specialties:

### **208 Agroengineering**

Educational-professional Program «**Agroengineering**»

The graduating departments:

Agricultural machinery and systems engineering them. Acad. P.M. Vasylenka

Tel .: (044) 527-85-37 E-mail: \_sgms@ukr.net

Head of Department – PhD, Gumenyuk Yuriy Olegovych

Mechanization of livestock

Tel .: (044) 527-85-35 E-mail: mechaniz\_chair@twin.nauu.kiev.ua

Head of Department – PhD, Khmelovskiy Vasyl Stepanovych

Technical service and engineering management .. them M.P. Momotenka

Tel .:( 044) 527-88-53\_ E-mail: vdv-tsim@ukr.net

Head of Department - Doctor of Technical Sciences, prof . Voytyuk Valery D.

Occupational Health and environment engineering

Tel .:( 044) 527-82-99\_ E-mail: voynaiov@bigmir.net

Head of Department - PhD. Voinalovych Alexander V.

Tractors and cars and biological energy systems

Tel .:( 044) 527-88-95 E-mail: gagolub@mail.ru

Head of Department - Doctor of Technical Sciences prof Golub Gennadii A.

### **275.03 Transport Technologies (on the Road Transport)**

Educational-professional Program «**Transport Technologies (on the Road Transport)**»

The graduating departments:

Transport technology and tools in agriculture

Tel .:( 044) 527-86-32 E-mail: p.ovchar22@ukr.net

Head of Department – PhD, Ovchar Petro A.

Tractors and cars and biological energy systems

Tel .:( 044) 527-88-95 E-mail: gagolub@ukr.net

Head of Department - Doctor of Technical Sciences prof Golub Gennady Anatolievich

Technical service and engineering management them MP Momotenka

Tel .:( 044) 527-88-53\_ E-mail: vdv-tsim@ukr.net

Head of Department - Doctor of Technical Sciences, prof . Voytyuk Valery D.

**Bachelor**  
**Field of Knowledge "Agricultural science and food"**  
**in Specialty "AGROENGINEERING"**  
**Educational-professional program «Agroengineering»**

Form of Training:	Licensed number of persons:
– Full-time	200
– Part-time	200
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian, English
Qualification	Bachelor of Agroengineering

**Concept of training**

Of knowledge and skills specialist in next generation processes, machines and equipment for plant growing, cattle breeding, biotechnology, process industry etc. 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.

**Practical training**

passage education (Trial, repair and metalwork) and industrial (mechanical-technological, vocational and technological, production in enterprises) recommended practices 127 enterprises, including strategic partners: KUHN Ukraine; John Deere Ukraine; Amaco Ukraine; Technician enerzhi; Astra; Zeppelin Ukraine; Lemken Ukraine; Vaderstadt Ukraine; Tan; HARDI; NSC "Institute of Mechanization and Electrification of Agriculture"; UkrNDIPVT them. Leonid Pogorelii.

**Proposed Topics for Bachelor theses**

1. Development of the process and rationale of cars growing crops (wheat, barley, rye, sorghum, sugar beet, corn, sunflower, etc.).
2. Development of technology and justification of technical service of agricultural machinery (by brand and type).
3. Evaluation of technical state of working of agricultural machinery (by brand mobile power tools, tractors, grain, corn, forage harvesters, beet machines, sowing complexes, etc.) in the development process of their recovery.
4. Development of technology and of technical substantiation of construction machinery (brands and types).
5. Development of the process and rationale of machine processing of agricultural products.
6. Development of the process and rationale of machines for the production of biofuels (biogas).
7. Development Process repairing agricultural machinery (brands) and justification (development) set of means of implementation.
8. Rationale kit machinery and equipment (vivotsefermy, MTF, pig, etc.) to the research process (maintenance, feeding, etc.).
9. Justification measures to prevent accidents and injuries in manufacturing processes APC.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Receives basic higher education and can work in positions that correspond to the 3rd and 4th qualifying levels under state classifier professions: Head of the repair shop, mechanized detachment chief engineer on the use of ICC technical service engineer, engineer, inspector health and safety.

**Bachelor`s Program and Curriculum  
in Specialty «Agroengineering»  
Educational-professional program «Agroengineering»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Physics	5,0	exam
CC 2	Descriptive geometry and computer graphics	5,0	exam
CC 3	Higher Mathematics	5,0	exam
CC 4	Higher and Applied Mathematics	3,0	exam
CC 5	Chemistry	5,0	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Ukraine history	3,0	exam
OB 1.2	Ethnocultural	3,0	exam
OB 1.3	Ukrainian language for professional purposes	3,0	exam
OB 1.4	Foreign Language	6,0	exam
OB 1.5	Physical Training	5,0	test
OB 1.6	Philosophy	5,0	exam
OB 1.7	Social sciences	4,0	exam
OB 1.8	Safety and life	4,0	exam
OB 1.9	Legal culture of the person	3,0	exam
<b>The volume of components of the general training cycle</b>		<b>59</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 6	Materials science and TCM	4,0	exam
CC 7	Theoretical Mechanics	4,0	exam
CC 8	Theory of mechanisms and machines	6,0	exam
CC 9	Mechanics of materials and structure	5,0	exam
CC 10	Tractors and cars	12,0	exam
CC 11	Agriculture machines	12,0	exam
CC 12	Fuel and lubricants and other operating supplies	4,0	exam
CC 13	Standardization and technical measurements	3,0	exam
CC 14	Parts of machines	4,0	exam
CC 15	Lifting machines	3,0	exam
CC 16	Machines and equipment for livestock	4,0	exam
CC 17	Machines in stockbreeding	6,0	exam
CC 18	Operation of machines and equipment	6,0	exam
CC 19	Technical service of machines	6,0	exam
CC 20	Reliability of equipment	4,0	exam
CC 21	Machines and equipment for processing of agricultural products	4,0	exam
CC 22	Basics of production management	3,0	exam
CC 23	Repair of machines	4,0	exam
CC 24	Electric agriculture Appliances	3,0	exam
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1	Technology of growing, processing and storage agriculture products	4,0	exam
OB 2.2	Computers and Computer Technology	3,0	exam
OB 2.3	The " machine -field - biological matrix "	3,0	exam
OB 2.4	Heating Engineering	4,0	exam
OB 2.5	Hydraulics	3,0	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.6	Basics of car and equipment management	4,0	exam
OB 2.7	Theoretical foundations of electrical engineering	4,0	exam
OB 2.8	Mechanical and technological properties agriculture materials	3,0	exam
OB 2.9	History and philosophy agriculture techincs	3,0	exam
OB2.10	Standardization and certification machinery and equipment	3,0	exam
OB 2.11	Hydro and Pneumodrive of new machines	5,0	exam
OB 2.12	Economic discipline	7,0	exam
OB 2.13	Machinery and equipment for biotechnology	4,0	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>147</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 25	Teaching practice	14	
CC 26	Practical training	7	
CC 27	Cultural education training	6	
CC 28	Preparation to diplom project	5	
CC 29	State certification	2	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Physics.** Increased knowledge and understanding of phenomena and laws of nature, reflected in classical and modern physics and related to the use of industrial, technology and everyday life to environmental protection and life safety.

**Descriptive geometry and computer graphics.** Formation of knowledge on the formation of geometric objects, and perform reading technical drawings, imaging techniques including computer graphics; teach students to geometric modeling of objects and processes to give them the knowledge and skills required to perform and read drawings for various purposes, such as that carried out by hand or computer, and solving for the pictures, drawings and model engineering geometric problems.

**Higher and Applied Mathematics.** Formation of theoretical knowledge and practical skills on the basis of mathematical apparatus, the main methods of quantitative measurement chance of factors affecting any processes, principles of mathematical statistics used in the planning, organization and management of production and technological processes.

**Chemistry.** Submit student basic theoretical issues of physical chemistry and basic concepts of Macromolecular Chemistry.

**Materials science and TCM.** Provide future skill set of knowledge and skills of fixed assets dimensional processing of structural materials and tools needed for understanding of modern agricultural engineering production.

**Theoretical Mechanics.** To deepen students' knowledge of theoretical material on the basic laws of nature on which settlement schemes create needed in the construction business, but also as a means of education to the future builders skills for scientific generalizations.

**Theory of mechanisms and machines.** To deepen students' knowledge of theoretical material on the basic laws of nature on which settlement schemes create



needed in engineering, but also as a means of education for future mechanical engineers skills for scientific generalizations.

**Mechanics of materials and structures.** Forming students' knowledge of strength of materials; Geometric characteristics of flat sections; external and internal forces; the method of sections; diagrams of the internal forces; tensile and compression; mechanical properties of materials; calculation for strength and rigidity at a stretching and compression; basic theory of stress and strain state; strength criteria; shift; torsion; bend; additional questions bending theory; sophisticated resistance; general theorem resilient systems, common methods for determining the movements; statistically undetectable system; calculation of plane curves beams; calculation of thick-walled cylinders and rotating discs; elements of the theory of thin shells; design calculation for the boundary conditions; stability of compressed rods; elastic vibrations; Strength of Materials steps to re-stress variables; payments under shock loads; contact stress; fracture mechanics bases.

**Tractors and cars.** Forming students' knowledge of basic operational characteristics of cars and tractors; Theory cars and tractors; design and calculation of the vehicle; structure and dynamics of internal combustion engines; construction of cars and tractors.

**Agricultural machinery.** The course provides future professionals with deep knowledge of the structure, construction and commissioning for the specific conditions of work agricultural machines, theory and calculation processes and working bodies of machines that are necessary for highly efficient use of means of mechanization in agricultural production, research aimed at improving the existing and new machines.

**Fuel and lubricants and other operating supplies.** In the study discipline deals with the theory and practice of fuel and lubricants for machines agricultural production. The course is designed for students to obtain knowledge on the rational use of fuels, lubricants, technical liquids and non-metallic materials, manufacture of fuels and lubricants, their assortments, properties of qualities as affecting the reliability and efficiency of engines units work machines agricultural production, ways of implementing fuels and lubricants not based on oil.

**Standardization and technical measurements.** Forming students' knowledge and skills that allow you to improve the quality of products qualified agricultural engineer, use of standards, regulations interchangeability, metrology and quality control.

**Parts of machines.** The study operating principles of calculation and design of machine parts and mechanisms of general purpose and handling equipment. We study kinematic calculations, the basis of calculation for strength and stiffness, design methods, the rational choice of materials.

**Lifting machines.** Study structure handling machines and the agricultural production mechanization and automation of agricultural production, methods of calculation and design.

**Machinery and equipment for livestock.** To provide students with knowledge about the structure, management, basic theory and methods of calculation machines and equipment for animal based ahrozotekhnichnyh, sanitary-veterinary and technical and economic requirements and work conditions.

**Machines in stockbreeding.** To acquaint students with the basics of streaming-design production lines in animal husbandry, installation and commissioning, production and technical service, research equipment and processes.

**Operation of machines and equipment.** Training specialist who can competently decide on operation of machines and equipment in conditions of farmers and individual farms, rental companies and peasant unions. The subject of the study is streaming mechanized processes of production of crops, methods of experimental determination and

theoretical calculation of basic technical and operational parameters of machine and tractor units and complete plants and their work in setting up producer.

**Technical service machines.** Obtaining theoretical knowledge and practical skills that will be needed in practice: design principles of maintenance of machinery and equipment APC; principles of the industrial and technological base of manufacturing equipment; procedure for installation and commissioning of machinery and equipment APC; principles for determining prospective directions of the agricultural and services service; basis of analysis and research designs of machinery and equipment and evaluation of their technical level; order documentation on the supply of logistics, preparation of reporting documentation, conducting technical examination and registration of complaints; procedure and methods of diagnosing complex machines, flaw details.

**Reliability of equipment.** Mastering the future mechanical engineer basics of technological processes of repair of machines and assemblies, get practical skills perform common maintenance operations.

**Machines and equipment for processing agricultural products.** To provide students with knowledge about the structure, management, basic theory and methods of calculation machines and equipment for processing agricultural products taking into account properties of agricultural materials and technical and economic requirements and working conditions.

**Basics of production management.** To acquaint students with the basics of streaming-design production lines in the processing industry, construction and commissioning, production and technical service, research equipment and processes.

**Repair of machines** Mastering the future mechanical engineer basics of mastering the basics of organizing repair facilities and bases of calculation and design of repair facilities.

**Electric agriculture Appliances.** Familiarization with basic electric and automation applications with automated control nodes, mechanisms and units of machines, advanced inspection systems and the latest electric drive and automation of calculation and automated management, introduction of integrated tools in the operating system, as well as in most software programming language.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines "Ukraine history", "Ethnocultural", "Philosophy", "Ukrainian language for professional purposes", "Foreign Language (English, German, French, Spanish)", "Physical Training", "Labour and Life Safety", "Social sciences", "Safety and life", "Legal culture of the person" see Section 2.1.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

Annotations disciplines "History of Ukraine and ethnocultural", "Philosophy", "Ukrainian language for professional orientation", "foreign language", "Physical Education", "Safety and life", "legal culture of personality" see. Section 2.1.

**Optional Block 2 (Student's Choice)**

**Technology of growing, processing and storage agriculture products.** The development of the system of knowledge development and evaluation of agricultural products, effective implementation of the selection process in the desired direction and organization biologically reasonable and economically expedient production technology, processing and storage of agricultural products.

**Computers and computer technology.** Requires educational and professional program students must be able to: build a comprehensive axonometric drawings and three-dimensional images of objects; intsydentnist solve the problem on two geometric figures (point, line, plane surface); solve problems at the intersection of two geometric shapes (straight, plane surface); find the distance between the geometric shapes and angles between them; law for a given formation projection points to build curves and surfaces; perform cuts and cross sections of complex geometric shapes; find life-size oblique sections; execute engineering and construction drawings for YESKD standards; Know: Principles and methods of construction projection images; positional methods for solving problems; metric methods for solving problems; methods of formation curves and surfaces; YESKD state standards.

**The "machine-field - biological matrix".** Academic discipline studies the basic principles of environmentally sound and cost-effective functioning of the "machine - biological matrix" in terms of vehicles in terms of interaction with the biological environment. As a result of the discipline the student acquires knowledge of the elements and indicators that define the system "machine - biological matrix 'lines and methods that improve the functioning of the" machine - biological media "and contributes to the quality of technological and transport operations under the terms of the ecological aspects of the use of mobile agricultural machinery and vehicles.

**Heating Engineering.** Mastering knowledge systems of methods of obtaining, transformation, transmission and use of heat and principle of thermal machines and apparatus intended for this purpose thermodynamics, heat transfer (heat transfer) that make up the theoretical foundations of heat engineering.

**Hydraulics** Formation of skills that allow the material to make the right choice considering the mechanical movement of fluid in various natural and man-made environment

**Basics of car and equipment management.** Forming students' knowledge of organizational and methodological foundations of practical training students in the process of driving and mobile agricultural machinery of machinery, technology, economics, planning, organization and management.

**Mechanical and technological properties of agricultural materials.** Formation of skills that allow to make the correct choice of material based agricultural mechanics and technological properties, provide savings in materials, weight; Theoretical Foundations of mastery.

**History and philosophy of agricultural machinery.** Introducing students to further their independent deliberation history increment of scientific knowledge within the individual branches of natural sciences, humanities, social and technical sciences under certain historical stages of development of science and culture in general in order to master the intellectual wealth of the world scientific culture, which is stored in history and the which is based modern science.

**Standardization and certification machinery and equipment.** Sets out the general principles of standardization, metrology and certification of agricultural machinery and equipment. Deals with the laws of Ukraine on standardization, metrology and certification and ISO Basis of normative documents for formation of specifications, processes for the manufacture of machinery and equipment, quality control cards and company standards.

**Hydro Pneumodrive and agricultural machinery.** The formation of future professionals skills and knowledge of modern methods of design, production and operation of modern machines agricultural production, which are equipped with hydraulic and pneumatic.

**Economic discipline.** The formation of future professionals of the agricultural sector of the special knowledge and practical skills in the field of Agricultural Economics, Planning indicators of industrial and economic activity, the use of agricultural economic management organization considering factors external and internal environment.

**Machinery and plant biotechnology.** To provide students with knowledge about the structure, management, basic theory and methods of calculation machinery and equipment. The development of a system of knowledge on the theoretical and practical foundations for the study of biotechnology processes with environmental focus and addressing related environmental challenges utilization (biopererobky) waste and rubbish, the degradation of the different nature of pollution, ensure the production of environmentally friendly products based on cheap and available raw materials.

**Bachelor**  
**Field of Knowledge "Transport"**  
**in Specialty "«Transport Technologies (on the Road Transport)»"**  
**Educational-professional program**  
**«Transport Technologies (on the Road Transport)»**

Form of Training:	Licensed number of persons:
– Full-time	100
– Part-time	100
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian, English
Qualification	Bachelor of transport technologies

**Concept of training**

Providing knowledge, skills and professional skills in the field of next generation transport technologies in the agricultural and environmental sectors 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.

**Practical training**

Passage education (trial, on management techniques) and industrial (professional and technological, production in transport companies) recommended practices 89 enterprises.

**Proposed Topics for Bachelor theses**

1. Development (improvement) of traffic on the street settlement using elements of the automated traffic control system.
2. Development of rational international routes of vehicles for the carriage of agricultural goods.
3. Development of transport and process crops for harvesting company (association management, etc).
4. Development of recommendations to improve the safety of vehicles and pedestrians on the road along the street (Avenue, Square, etc.) the settlement.
5. Development of transport and production process when transporting farm animals in the enterprise (association management, etc).
6. Development of transport and production process at transportation of poultry in terms of the company (association management, etc).
7. Development of transport and production process for the carriage reproductive material of farm animals and poultry in terms of the company (association management, etc).
8. Development of measures to improve the use of vehicles in ATP.
9. Development of transport and production processes during transportation of agricultural products (milk and milk products, bread and bakery products, etc.) in terms of business.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Receives basic higher education and can work in positions that correspond to the 3rd and 4th qualifying levels under state classifier professions: specialist logistics, logistics expert, a technical expert in management, transport operations inspector, the inspector of traffic safety, inspector of safety and quality, detachment chief vehicle engineer of the use of vehicles, technical service engineer.

**Bachelor`s Program and Curriculum in Specialty  
«Transport Technologies (on the Road Transport)»  
Educational-professional program  
«Transport Technologies (on the Road Transport)»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Physics	3	exam
CC 2	Higher Mathematics	11	exam
CC 3	Basics of customs legislation	3	exam
CC 4	Chemistry	3	exam
CC 5	Probability and Mat.statystyky	4	exam
CC 6	General Course of Transport	4	exam
CC 7	Tansportne Law	5	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian Statehood	3	exam
OB 1.2	Ethnocultural	3	exam
OB 1.4	Ukrainian for professional purposes	3	exam
OB 1.5	Foreign language (English, German, French, Spanish)	6	exam
OB 1.6	Physical educationphilosophy	4	test
<b>The volume of components of the general training cycle</b>		...	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 8	Vehicles	4	exam
CC 9	Basic theory of transport processes and systems	7	exam
CC 10	Shipping trasologii	3	exam
CC 11	General course of transport	4	exam
CC 12	Basic theory of transport processes and systems	7	exam
CC 13	Organization of traffic	4	exam
CC 14	Operational properties of roads and buildings	3	exam
CC 15	Information Systems and Technology	8	exam
CC 16	Freight transport	8	exam
CC 17	Technologically transport processes in agriculture production	4	exam
CC 18	Passenger transportation	7	exam
CC 19	Interaction of transport	6	exam
CC 20	Technical means of traffic	4	exam
CC 21	Fundamentals of economy of transport ( tariffs and tariff system)	6	exam
CC 22	Logistics	4	exam
CC 23	Technology storage of agricultural products during transportation	3	exam
CC 24	Safety and life	3	exam
CC 25	Vehicle safety	3	exam
CC 26	Organization of international road	3	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.7	Social sciences	7	test
OB 1.8	Philosophy	4	exam
OB 1.9	Safety and life	3	exam
<b>Optional Block 2 (Student`s Choice)</b>			
<b>Optional Block 2.1</b>			
OB 2.1.1	Engineering and Computer Graphics	3	exam
OB 2.1.2	The "machine - biological matrix "	3	exam
OB 2.1.3	Technical mechanics	3	exam
<b>Optional Block 2.2</b>			

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.2.1	Knowledge of cargo	3	exam
OB 2.2.2	Hoisting machinery	3	exam
OB 2.2.3	Traffic rules	3	exam
OB 2.2.4	Lubricants and other operating supplies	3	exam
OB 2.2.5	Fundamentals of Engineering Management	3	exam
OB 2.2.6	Performance Features vehicles	3	exam
OB 2.2.7	Maintenance vehicle	3	exam
OB 2.2.8	Technology storage of agricultural products during transportation	3	exam
<b>The volume of components of the special (professional) training cycle</b>		...	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 27	Military training	29.0	test
CC 28	Cultural education preparing	6.0	test
CC 29	Teaching practice	14.0	test
CC 30	Manufacturing Practice	7.0	test
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	<b>7200</b>

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Physics.** Increased knowledge and understanding of phenomena and laws of nature, reflected in classical and modern physics and related to the use of industrial, technology and everyday life to environmental protection and life safety.

**Higher mathematics.** Formation of theoretical knowledge and practical skills on the basis of mathematical apparatus, the main methods of quantitative measurement chance of factors affecting any processes, principles of mathematical statistics used in the planning, organization and management of production and technological processes.

**Basics of customs legislation.** Mastering the students basic theoretical and methodological foundations of customs regulation of foreign economic activity in the integration of Ukraine into the world community, as well as providing them with knowledge of tariffs as a tool to implement foreign policy and national security of Ukraine, the formation of the state budget.

**Vehicles.** Forming students' knowledge in the field of transport, review of the research and development of various types of vehicles. Specifications, parameters and indicators of vehicles, their design features and operation.

**Chemistry.** Submit student basic theoretical issues of physical chemistry and basic concepts of Macromolecular Chemistry.

**Probability and Mathematical Statistics.** Formation of theoretical knowledge and practical skills on the basis of mathematical apparatus of the theory of probability and mathematical statistics, basic methods of quantitative measurement chance of factors affecting any processes, principles of mathematical statistics used in the planning, organization and management of production and technological processes.

**Operations research in transport systems.** Formation of theoretical knowledge and practical skills formalize control problems in transportation systems using specialized optimization methods.

**Transport trasologii.** Provide students with a system of theoretical knowledge and practical skills to form a correct application of the law in the expert trasoloha.



General course of transport. Mastering the concept of "integrated transport system", "integrated transport network", and the acquisition of knowledge on the importance of all forms of transport for the timely and quality to meet the needs of industries and population in traffic, increase economic efficiency of the transport system.

### ***Optional Block 1 (University Choice)***

Annotations disciplines "History of Ukraine and Ethnocultural", "Philosophy", "Ukrainian language for professional orientation", "foreign language", "Physical Education", "Safety and life", "legal culture of personality" see. Section 2.1.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

**Principles and theories of management.** Forming students' knowledge on the general methodology of focus, methods, systems theory and systems analysis applied in the management of organizations and decision-making regarding administrative, financial and production problems, the theory of purposeful systems, their modeling and research, targeted for use in transportation technology .

**Basic theory of transport processes and systems.** Formation of the conceptual apparatus systematology, acquiring knowledge about the mathematical foundations of describing transport systems, modeling and analysis of their functioning within the system approach; acquiring the necessary skills application of knowledge to solve practical problems. The subject of discipline is the process of transport for passengers and goods and resources for its operation.

**Operations research in transport systems.** Formation of theoretical knowledge and practical skills formalize control problems in transportation systems using specialized optimization methods.

**The organization of the road.** Forming students theoretical and clear legal knowledge and skills for surveillance of road transportation of dangerous, oversized and heavy cargo and practical skills to use them in practice SAI; deep understanding of the importance of traffic management and surveillance of roads, flawless performance of official duties, self-help tasks facing the traffic police Internal Affairs of Ukraine, and functions related to the implementation of traffic management services; identifying and documenting crimes related to the maintenance and operation of roads, buildings and road crossings, transportation of dangerous, oversized and heavy cargo.

**Operational properties of roads and buildings.** Learn the basics of technology and production organization roads and buildings, structures and products; determine the direction of the production base; teach the technical and economic indicators perform selection flowsheets, raw materials and equipment with the use of operational properties of roads and buildings.

**Information systems and technology.** Forming students' knowledge of sustainable building modern information systems and technology, and develop skills to create databases using modern database management systems and data banks.

**Freight transport.** Forming students' academic and professional expertise in organizing, planning and managing various kinds of cargo transportation. Subject dysziplyny is a process of cargo units, transportation of goods from shipment to places of consumption and processes to ensure their implementation.

**Technologically transport processes in agricultural production.** Learn the basics of technology and technology-organization of transport processes in agricultural

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production, to teach the technical and economic indicators to justify the choice to carry out technological schemes of raw materials and equipment.

**Passenger traffic.** Formation of knowledge and understandings conceptual foundations of the organization and management of passenger traffic, the acquisition of skills for process control passenger traffic. The subject is discipline techniques and methods of organization of passenger transport.

**Interaction of transport.** Study of the main provisions of the complex problems of development and interaction between different modes of transport as a unified system. The subject of discipline are the ways of interaction between different modes of transport in transport nodes. According to this expert in the field of transport technologies should know: bases the development process of delivery, method of transport process operational management, fundamentals of interaction modes of transport, estimate the interaction of transport networks and nodes; be able to: analyze in the transport of intermodal traffic, organize planning and management to determine the costs and benefits to find ways of further development, to determine the characteristics of traffic in mixed traffic, to determine compliance with transportation and processing facilities of interacting modes of transport and to choose the means to harmonize their performance, analyze Technology Combined transport in order to establish areas of use, costs and benefits to find ways of further development, predict traffic development prospects in mixed traffic; have an understanding of the organization of control over the implementation of the process, the organization of monitoring and control and execution of certain operations of the complex as a whole.

**Technical means of traffic management.** Explore Foundations of placement of road signs, markings use in accordance with road conditions, operation of means of control, road and fence rails devices, materials and equipment for marking.

**Fundamentals of transport economics.** Getting students the knowledge, skills and abilities that allow to structure and solve the economic problems of transport and thus ensure its competitiveness in the transport market.

**Transport Law.** The objective of discipline is legal provisions extrapolation to the field of industrial relations as preparing qualified obtaining them requires the relevant set of legal expertise and practical skills in international and national transport law needed to work on national and international markets of transport services, as well as the formation of his understanding of contemporary issues legal organization of transport, international legal norms and principles governing the relations of the transport market.

**Logistics.** Summary course provides students acquisition of theoretical knowledge in management of logistics, means of production and commodity-material stocks transport companies, trade organizations and databases in the marketplace.

**Transport planning of rural areas.** Mastering the basics of designing residential areas of the village, the industrial zone of the village, street and backbone of the village, landscape and recreational areas, rural infrastructure.

**Security vehicles.** Learn the basics for safe operation and use of vehicles, studying the theoretical foundations of traffic safety on the streets, etc., studies the movement of vehicles.

**Organization of international road transport.** Learn the basics of technology and organization, definitions, basic provisions, state road transport in Europe, the role of the transport factor in the economy of Ukraine, international freight transport in Ukraine, problems of improving the competitiveness of road transport Ukraine, information transport, the general concept of the document.

### Optional components

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**Optional Block 2 (Student's Choice)**

**Engineering and computer graphics.** Formation of knowledge on the formation of geometric objects, and perform reading technical drawings, imaging techniques including computer graphics; teach students to geometric modeling of objects and processes to give them the knowledge and skills required to perform and read drawings for various purposes, such as that carried out by hand or computer, and solving for the pictures, drawings and model engineering geometric problems.

**The "machine-biological media"** Provide scientific principles and teach future specialist car transporter synthesis and properties of biological matrix when used in industrial processes transport.

**Technical mechanics.** To deepen students' knowledge of theoretical material on the basic laws of nature on which settlement schemes create needed in transport technologies, but also as a means of education in the future of transport skills for scientific generalizations.

**Optional Block 2 (Student's Choice)**

**Knowledge of cargo.** He studies the properties of objects and materials related to the process of transportation.

**Hoisting machinery.** Study structure handling mechanization and automation of agricultural production, methods of calculation and design.

**Lubricants and other operating supplies.** In the study discipline deals with the theory and practice of fuel and lubricants for road transport. The course is designed for students to obtain knowledge on the rational use of fuels, lubricants, technical liquids and non-metallic materials, manufacture of fuels and lubricants, their assortments, properties of qualities as affecting the reliability and efficiency of work of engines units of cars by introducing fuel and lubricants for not petroleum-based.

**Performance Features vehicles.** Consider the basic laws of motion of vehicles, as well as their relationship with the specifications, design parameters and conditions of movement of vehicles.

**Fundamentals of Engineering Management.** Formation of modern management thinking, the basics of system management organizations of any species - adequate decision-making on the future place of work. Forming students-Transport Knowledge of theoretical foundations and practical skills of management and marketing.

**Maintenance vehicles.** To study the main factors that determine the organization of maintenance and repair of vehicles, economic and geographical characteristics of the city (district) mode of production divisions, selection and adjustment of standards for the design of transport, the calculation of the production program of the company TOR, the calculation of the production program of maintenance and repair by the number of technical acts, the calculation of the production program of maintenance and repair work units, the calculation of the production program ancillary works.

**Technology of storage of agricultural products during transportation.** To give students a basic knowledge of the technologies of agricultural products plant and animal origin to the transportation and direct transport various technical means of modern technologies with minimal losses; teach students to find and implement the most effective technology and mechanization of transportation of agricultural products; justify hygiene requirements for the quality of raw materials and finished products during transportation of agricultural products.

## 2.9. FACULTY OF CONSTRUCTION AND DESIGN

**Dean** – Ph.D. (Technical Sciences), associate professor **Zynoviy Ruzhylo**

Tel.: +38 (044) 527-81-29 E-mail: dekanat\_kd@ukr.net

Location: building № 11, room 305

The faculty organizes and coordinates Bachelor training in the following specialties:

### **133 Sectoral engineering**

Educational-professional program «**Sectoral engineering**»

Graduating departments:

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

Reliability of Machinery

Tel.: (044) 527-87-71 E-mail: novitskiyAV@ukr.net

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

Tractors and automobiles and bio energy system

Tel.: +38 (044) 527-88-95 E-mail: [gagolub@ukr.net](mailto:gagolub@ukr.net)

Head of department – Doctor of Technical Sciences, professor Gennady Golub

Mechanics

Tel.: +38 (044) 527-83-25 E-mail: berezovyi@nubip.edu.ua

Head of department – Ph.D. (Technical Sciences), associate professor Mykola Berezovyi

### **192 Construction and civil engineering**

Educational-professional Program «**Construction and civil engineering**»

Graduating departments:

Construction

Tel.: (044) 527-85-78 E-mail: bakulin959@ukr.net

Head of department – Candidate of Technical Sciences, associate professor Evgenyi Anatolyevich Bakulin

Mechanics

Tel.: +38 (044) 527-83-25 E-mail: berezovyi@nubip.edu.ua

Head of department – Ph.D. (Technical Sciences), associate professor Mykola Berezovyi

**Bachelor  
in speciality «SECTORAL ENGINEERING»  
Educational and professional program «Sectoral engineering»**

Form of Training:	Licensed number of persons:
– full-time studying	170 students
– part-time studying	120 students
Duration of studying:	
– full-time studying	4 years
– part-time studying	5 years
Credits	240 ECTS
Language	Ukrainian, English
Academic degree	Bachelor of Engineering

**Conception of training**

Today agroindustrial production requires the presence of multifunction machines and equipment. Such machines can be created only at presence of highly skilled staff – engineers-designers. Training of engineers-designers is based at high level of teaching of fundamental and general technical disciplines, and also knowledge of perspective development of agricultural machines constructions.

**Practical training**

During practical training the faculty is oriented on close co-operation and collaboration with educational-experimental enterprises of university, such as: Separated subdivision of NULES of Ukraine “Velykosnytynske Education and Research Farm named after O. Muzychenka”, Separated subdivision of NULES of Ukraine “Agronomic Research Station”, Separated subdivision of NULES of Ukraine “Education and Research Farm “Vorzel”, Separated subdivision of NULES of Ukraine “Boyarka Forestry Research Station”.

**Proposed Topics for Bachelor theses**

1. An improvement of oil filter in the diesel biofuel production line;
2. An improvement of methane-tank construction for the biogas production;
3. Development of machine for trees transplantation;
4. Development of turn mechanism of stationary wrecker crane;
5. An improvement of device of sprinkler of the field cultures for liquid mineral fertilizers application.

**Academic rights of Graduates:** graduates can apply for Master’s Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

The enterprises of the special purpose of specialist training and bases of practical studying are offered for further employment or at leading enterprises of agroindustrial and nature protection industries of economy of Ukraine.

**Bachelor`s Program and Curriculum  
in Specialty «Sectoral engineering»  
Educational-professional program «Sectoral engineering»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Higher mathematics	9	exam
CC 2	Chemistry	3	test
CC 3	Informatics and computer equipment	3	test
CC 4	Descriptive geometry	3	exam
CC 5	Physics	5	exam
CC 6	Applied mathematics	3	test
CC 7	Theoretical mechanics	5	exam
CC 8	Material sciences	5	exam
CC 9	Technology of constructing materials	4	exam
CC 10	Mechanics of materials and constructions	7	exam
CC 11	Interchangeability, Standardization and technical measuring	5	exam
CC 12	Theory of mechanisms and machines	8	exam
CC 13	Engineering and computer graphics	6	test
CC 14	Mechanical and technological properties of agricultural materials	3	test
CC 15	Parts of machines	7	exam
CC 16	Machines and equipment for crop production	6	exam
CC 17	Basis of machines constructions for animal production	6	exam
CC 18	Machinery and equipment for bioenergetics	3	exam
CC 19	Hydraulic driving devices of agricultural technics	4	exam
CC 20	Heating engineering	3	exam
CC 21	Dynamics and durability	3	test
CC 22	Professional orientation	3	test
CC 23	Technology of mechanical engineering	7	exam
CC 24	Basis of constructing of mobile power vehicles	7	exam
CC 25	Lifting and transporting machines	3	test
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Ethnocultural	3	exam
OB 1.2	Philosophy	3	exam
OB 1.3	Foreign Language	5	test
OB 1.4	History of Ukrainian statehood	3	exam
OB 1.5	Ukrainian for professional purposes	3	test
OB 1.6	Patent and Copyright	3	test
OB 1.7	Basis of electrical engineering	3	exam
OB 1.8	Labor protection	4	exam
OB 1.9	Hydraulics	3	exam
OB 2.0	Physical training	-	test
OB 2.1	Facilities for automation of technics	3	test
OB 2.2	Fundamentals of management, marketing and entrepreneurship	3	test
<b>The volume of components of the general training cycle</b>		<b>159</b>	
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1 «Machines and equipment of agricultural productions»</b>			
OB 2.1.1	Technology of animal production	3	test
OB 2.1.2	Technology of crop products production	8	test
OB 2.1.3	Designing of agricultural machines	6	test
OB 2.1.4	Modeling machines and aggregates	4	test
OB 2.1.5	Fuels, oils and other consumables	3	test
OB 2.1.6	Tillage mechanics	3	test

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.1.7	Theory of cutting, metal-working and instruments	4	test
OB 2.1.8	Bioenergy systems in agricultural production	3	test
OB 2.1.9	Reliability of agricultural technics	4	exam
OB 2.2.0	Constructing of agricultural machines	9	exam
OB 2.2.1	Economic effectiveness of design solutions	3	test
OB 2.2.3	Fundamentals of technics control	5	test
<b>Optional Block 3.1 «Equipment of forest complex»</b>			
OB 3.1.1	Timber plant species	3	test
OB 3.1.2	Machines and equipment for forestry	8	exam
OB 3.1.3	Theory of cutting, woodworking machine-tools and equipment	6	test
OB 3.1.4	Fuels, oils and other consumables	4	test
OB 3.1.5	Woods cutting and transporting	3	test
OB 3.1.6	Designing of machines for forestry	3	test
OB 3.1.7	Woodworking technology	4	test
OB 3.1.8	Standardization and certification of machines	3	test
OB 3.1.9	Basics of technology management	4	test
OB 3.2.0.	Constructing of machines for forestry	9	exam
OB 3.2.1.	Economic efficiency of construction solutions	3	test
OB 3.2.2.	Reliability equipment of forest complex	5	exam
OB 3.1.1	Technical maintenance of machines and equipment of forest complex	4	test
<b>Optional Block 4.1 «Robotics and robotic systems and complexes»</b>			
OB 4.1.1	Robot and UAV control systems	3	test
OB 4.1.2	Robot touch devices	3	test
OB 4.1.3	Optimization of robot motion modes and UAV	8	test
OB 4.1.4	Operating systems and robot programming languages and UAV	6	test
OB 4.1.5	Fuels, oils and other consumables	4	test
OB 4.1.6	Robot and UAV mechatronic systems	3	test
OB 4.1.7	Mobile platforms and robot drives	5	test
OB 4.1.8	Robot, manipulator and UAV dynamics	3	test
OB 4.1.9	Reliability of robotic systems	6	exam
OB 4.2.0.	Calculation and construction of robots and manipulators	12	exam
OB 4.2.1.	Economic efficiency of construction solutions	3	test
OB 4.2.2.	Basics of technology management	3	test
<b>The volume of components of the special (professional) training cycle</b>		<b>173</b>	
<b>5. OTHER TYPES OF TRAINING</b>			
CC 5.1	Military training course		
CC 5.2	Academic Practice	9	test
CC 5.3	Production Practice	6	test
CC 5.4	Driver training		
<b>THE TOTAL AMOUNT OF EPP</b>		<b>332</b>	

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Higher mathematics.** The study of this discipline allows learning to use mathematical (analytical) methods for description and study of physical, technical, technological and other processes. Knowledge of the systems of linear equalizations, basis of vector algebra, equalizations of line and plane in space, basic formulas and

theorems of differential and integral calculation, substantive provisions and methods of decisions of differential equalizations will allow to decide and analyse the systems of linear equalizations, decide the tasks of analytical geometry and mathematical analysis, apply knowledge in practice, ground decision, conduct the analysis of decision, apply mathematical methods to the decision of the applied technical and technological tasks.

**Chemistry.** (Fundamental discipline «chemistry» provides students of knowledge about composition, structure, properties and transformations of matters, which are basis of construction materials, and knowledge of terms of protracted, saving, ecologically – safe exploitation of machines and systems of natural resources using. The study of chemistry provides a basis for training students professionally – the oriented and special disciplines and it promotes forming of modern world view of a man.)

**Computer science and equipment.** The informative processes, methods and facilities of getting, transformation, transmission, storage and usage of information, application of information technologies are studied in the discipline course. The purpose of discipline study is forming of modern level of informative and computer culture, grant to the students and fixing by them knowledge of basis of computer science and computing engineering, acquisition of practical skills of work on a modern computer technique, and also ability to apply them during work with the modern computer systems of treatment of information.

**Descriptive geometry.** (Discipline studies dimensional forms and methods of their image on a plane, examines the methods of construction of images and methods of decision of dimensional tasks by these images. The study of discipline allows developing dimensional thought and capacities for the analysis of geometrical forms, forms skills of construction of volume graphic models, operation by draft as the mean of graphic information transfer.)

**Physics.** (The discipline studies properties of the material world, a variety of physical phenomena, principles of co-operation and motion of material bodies, and also processes and mechanisms for their control, called to form students' analytical and modelling thinking. A student acquires physical knowledge during the process of mastering of physical concepts, principles, and theories for the further learning general technical disciplines.)

**Applied mathematics.** (The applied mathematics which is based on a theory of chances and mathematical statistics is the important constituent of mathematical education of future specialists. The purpose of discipline – to teach future specialists bases of modern mathematical tools, necessary for an analysis and decision of practical tasks, to assist in forming the students' skills in mathematical design and using of mathematical methods to solve applied tasks.)

**Theoretical mechanics.** (The discipline studies general acts and principles of mechanical motion, equilibrium of material objects, mechanical systems and existent methods and facilities of solving tasks, drafting of calculation models of the real technical objects.)

**Material science.** (Principles, which determine structure and properties of materials depending on their composition and terms of treatment, are studied in this course. The course allows to study the modern high-efficiency methods of increasing the properties of durability, corrosive firmness, heating- and frost resistant alloys, effective methods of treatment of surface of wares with the purpose of substantial increasing of anticorrosive firmness, development and use of new polymeric and composition materials with the set complex of properties.)

**Technology of construction materials.** (This discipline studies basic information about the methods of receipt of construction materials and methods of its physical and chemical, technological and mechanical treatment with the purpose of providing of



necessary properties and forming of wares in the proper constructions of machines and mechanisms.)

**Mechanics of materials and constructions.** (The discipline studies the methods of engineering calculations of machine details, elements of construction on durability, inflexibility and firmness in the conditions of action of the static and dynamic loadings recognition change of temperature and processes, related to duration of exploitation at simultaneous reliability, longevity and economy.)

**Interchangeability, standardization and technical measuring.** (The discipline purpose is studying principles of organization of machine-building production on the basis of interchangeability, acquaintance with the operating norms of precision and quality, capture methods and methods of their control, studying bases of standardization and quality management of products in machine industry. Mastering of discipline will allow to the future engineers to provide the necessary level of planning of machines and technological rigging due to using of decisions which are based on principles of interchangeability and standardization.)

**Theory of mechanisms and machines.** (The discipline studies bases of research, calculation and planning of the mechanical systems, devices, mechanisms and equipment in the conditions of editing, exploitation and unitization of working machines in modern agricultural building, and also general methods of structural, kinematics and dynamic analysis and synthesis of mechanisms and machines of agricultural technique.)

**Engineering and computer graphic arts.** (The questions of imaging by projection method of technical wares, units and details, methods of details connection; the rules of presentation of information of their making technology and application conditions are studied in discipline. The studying of standards, related to the drafts of details, is carried out in the process of implementation of graphic tasks.)

**Mechanical and technological properties of agricultural materials.** (It is complex discipline which studies physical and mechanical properties of such agricultural materials, as soil, fertilizers and material of hypogenous taking into account the changes of temperature and humidity.)

**Parts of machines.** (It is base technical discipline which studies methods, rules and norms of calculation and constructing of typical details and frame-clamping units of machines. Bases of calculations are also studied on durability and inflexibility, methods of constructing, rational choice of materials and methods of connection of details. The task of course is to get skills of calculation and constructing of machine details and units, to master methods, rule and planning norms, which are provided of making the reliable and economic constructions, and also development engineering thinking of students.)

**Machines and equipment for crop production.** (The constructions of machines, types and structure of their workings organs and occasions, process of co-operation of worker of parts, are examined with the processed material and environment, and also technological adjusting and classification of machines and equipment which is used in a plant-grower.)

**Basis of machines constructions for animal production.** (It is complex discipline which studies the value of mechanization of technological processes of production of goods of stock-raising and zootechnic requirements to the processes and hardware, that they are executed. The question of structure, principle of action, classification and estimation, and also basis of constructing and calculation of machines and equipment of stock-raising enterprises is considered.)

**Machinery and equipment for bioenergetics.** (The discipline involves studying the theoretical principles and methods of machines and equipment parameters calculation for the production of renewable energy from biomass, the acquisition of practical skills for working processes and adjustment of engineering tools for making and effective using of biofuels in agricultural sector.)

**Hydraulic driving devices of agricultural technicians.** (Discipline studies structures, theories of workings processes and rules of exploitation of hydraulic driving devices, which are needed for the high-efficiency use of agricultural technique, high-quality service and repair, purposeful perfection. The study of construction, principle of action, adjusting, hydrokinetics, characteristics of speed and power of hydraulic driving devices used in agricultural machines and bases of theory is foreseen to the calculation of hydraulic devices.)

**Heating engineering.** (The discipline studies features and technical aspects of transformation of natural energy resources (organic and nuclear fuel, warmth of bowels of the earth, energy of sun, water and wind and others) in the directly in-use forms of energy (warmth, work and their derivatives, for example – electric energy). Discipline includes technical thermodynamics, theory of heating- and mass-transfer, examines heat-engines and refrigeration devices, compressors and ventilators, fuel burning equipment and caldron settings.)

**Dynamics and durability.** (It is complex discipline, which studies the methods of engineering calculations of details of machines, elements of construction on durability, inflexibility and firmness at additional influence of forces of inertia, which arise up at the dynamic loading and swaying processes. The separate section of this discipline is devoted to the methods of engineering calculations of details of machines and elements of construction on durability, inflexibility and firmness at presence of cracks.)

**Professional orientation.** (The course reveals the essence of training specialists in the speciality "Mechanical engineering» develops an understanding of the specifics of the field of "Machinery & materials", acquaints students with their capabilities in order to offer them to choose one of the most appropriate professions taking into account the needs of production.)

**Technology of mechanical engineering.** (The discipline studies the methods of obtaining and processing of blanks to ensure high quality of products, economy of materials, high productivity. It includes the development of technological processes (routing and operating) the receipt and processing of work pieces, that make various of structural materials, their technical and economic characteristics, the study of the schematics of equipment and tooling, design shops of machine-building plants issues manufacturability of designs blanks, parts, machines and equipment, taking into account methods of their obtaining, technological methods of increase of reliability of machine.)

**Basis of constructing of mobile power tools.** (The discipline gives to the future engineers necessary knowledge from bases of theory and methods of substantiation of parameters and indicators of tractors and cars and their engines, definition of dependence of their performance against speed and power indicators, construction and working conditions, methods and equipment for testing of tractors and automobiles, basic tendencies and directions of their improvement, acquires the skills to formulate requirements to the properties and operating characteristics of tractors and cars depending on the operation conditions, perform analytical substantiation of their main parameters, taking into account the perform analytical substantiation of their main parameters under particular conditions of agricultural production and the achieved level of autotractor industry, independently solve the problems of the heat and dynamic calculation of automotive engines and traction and dynamic calculations of tractors and cars.)

**Lifting and transporting machines.** (At the study of discipline the structure of different types of a lifting-transport equipment, methods of planning of modern facilities of mechanization and automation of constituent and movable operations, is examined, in a that number conveyers, conveyers, robots, manipulators, and also facilities of small mechanization, method of calculation, constructing, planning and exploitation of machines and mechanisms which execute lifting-transport operations.)

**Optional components*****Optional Block 1 (University Choice)***

**Ukrainian language (professional direction).** The purpose of the discipline is to improve the level of general language training, communicative competence of students, practical mastery of the basics of Ukrainian language stylistics, will ensure professional communication at an appropriate level. The discipline is designed to generalize and systematize knowledge of the Ukrainian language, to form skills and abilities for optimal speech behavior in the professional sphere.

**History of Ukrainian statehood.** Study course provides a deep understanding of student learning and the history and formation of the Ukrainian people and Ukrainian statehood, strengthening national identity, political coverage classes and social groups in Ukraine at certain stages of historical development. Total calling rate is based on processes that humanization of higher education, professional integration and socio-humanitarian training, improved content structure of the course, the achievements of world and domestic opinion, human values, carry out training of highly qualified specialists agriculture.

**Foreign language (English, German, French).** Study course develops the students' communicative competence, namely the use of skills, abilities and knowledge of a foreign language in the course of business relations with other countries on various issues related to business and the labor market in agriculture, preparations for participation in international conferences, projects and discussions, and presentations, a written exchange of business information (formal and informal letters, resumes the different types of research articles and reports), contributing thus inconsistency student's development and socialization in a foreign language society.

**Philosophy.** The course is taught a system of knowledge of these parts of philosophy as ontology, epistemology (theory of knowledge), social philosophy, philosophy of historical types, revealing the nature of relations "man - the world" in its most basic forms. The course is marked ideological orientation that allows to synthesize the knowledge gained in professional and humanitarian disciplines in a holistic worldview - a theoretical basis for university level training.

**Physical education.** The purpose of teaching the discipline is to form a physical culture of a young specialist and the ability to implement it in social and professional training and in the family. The objective of the discipline is to strengthen the health of students and the development of physical abilities corresponding to the professional activity of a future specialist.

**Ethnocultural.** Discipline studies the patterns of development and functioning of the cultural life of society, the mechanisms of formation of ethnic, managing cultural processes. In the discipline are considered main stages of the world and national culture, social organizations and movements in the socio-political and cultural life of the community, identity and politics, political culture, global cultural process.

**Patenting and copyright.** The study of this discipline allows future specialists in the field of agricultural engineering to obtain the necessary knowledge of the system of intellectual property protection, the ability to apply in practice methods of legal protection of scientific and technical achievements and creative products.

**Basis of electrical engineering.** (The main task of the course is a study of bases of power supply, electromechanic and facilities of electricity safety. During studying student masters basic principles, applied at the analysis of electric circles, basic methods of analysis of electric circles, seizes the general method of construction of scheme and mathematical models of electrical engineering chains, able to analyze typical electrical engineering chains at typical external influences, has practical skills of analytical, numeral

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and experimental research of basic processes which take place in electrical engineering chains, knows rules and charts of power supply, electrical driving devices and safety of electricity.)

**Life Safety** (The discipline covers legal and organizational issues of labor protection, hazardous and harmful factors of the working environment and methods of their reduction to standard values, the basics of fire safety and electrical safety in order to prevent accidents and occupational diseases at work. The purpose of the discipline is theoretical and practical training of specialists, who on the basis of the knowledge were able to develop and implement safe working conditions at the working places of agro-industrial complex employees, to design technical asobi safety. The objective of the discipline is to train future specialists capable of implementing labor protection solutions aimed at improving working conditions, reducing injuries and occupational diseases in the field of agro-industrial complex, and increasing efficiency.)

**Hydraulics.** (In the cycle of disciplines the basic physical and mechanical properties of liquids, substantive provisions of hydrostatics, hydrodynamics are marked. The existing structures of hydraulic machines, basis of hydraulic driving devices are studied. The planning and calculation of the agricultural water systems are conducted.)

**Facilities of automation of agricultural technicians.** (The purpose of course is to obtain knowledge on questions the features of construction and work of separate elements and systems of electrical equipment: principles and facilities of power supply, construction of facilities of lamplight and methods of its calculation, principles of construction and calculation of the electric heating and electrotechnology, construction of systems of electromechanic and use of separate types of electromechanic in a modern agricultural production.)

**Fundamentals of management, marketing and entrepreneurship.** Formation of the ability to solve professional issues; formation of practical skills in organizational design, financial resources management, etc.; to teach to make appropriate and reasonable managerial decisions, to analyze the generalizing economic performance of a construction organization, to defend their point of view adopted decisions, to lead a discussion. Formation of legislative base for creation and running own business.

### ***Optional Block 2 (Student's Choice)***

#### ***Optional Block 2 „Machines and equipment of agricultural productions”***

**Technology of animal products production.** (Discipline is included in the block of disciplines after the choice of student, which form a bachelor, capable on the basis of knowledge of biological features of agricultural animals and progressive technologies of purveyance of forage and technologies of production of milk, beef, pork, products of the pig breeding and sheep breeding to get the products of high quality with the least charges of forage and labour. In discipline the biological features of agricultural animals, progressive technologies of purveyance of forage and technology of production of different types of products of stock-raising, zootechnic requirements, are examined to the machines, equipment and facilities of mechanization and automation on stock-raising farms and complexes.)

**Technology of crop products production.** (A course is occupied by a central place in agricultural production and built on principles (principles) of biological science, which studies the features of development of plants, their requirement to the terms of environment. On principle it is important to capture the complex of modern knowledge and skills, which allow to promote the productivity of agricultural cultures, improve quality and stored of products on the basis of knowledge of biology of cultures in relation to concrete

ground-climatic terms, a future engineer, and also effectively to use ground-climatic resources and guard of environment.)

**Design and ergonomics of agricultural machines.**(In an educational course disciplines are examined substantive provisions of design are sciences about the artistic constructing of technique, his category, their property and quality. Facilities and methods of prosecution are studied of form, composition of machine; skills of development of characters of functions of control and management are obtained; students meet with the right of ownership on developments in industry of design and bases of its defence.The main points of ergonomics are considered – scientific and practical discipline, which studies activity of man, instruments and facilities of its activity, environment in the process of their co-operating with the purpose of providing of efficiency, safety and comfort of vital functions of man. Influence of psychical tension, fatigue, emotional factors and personal qualities of man is investigated on efficiency of labour activity. The features of perception, attention, memory, thought of man are studied, it agile vehicle, possibility of perception and redoing of information.)

**Modelling of agricultural processes.** (Bases of design of agricultural processes on the computer are considered, basic concepts and determinations are set, and the methods of application of computer are investigated for management processes in the production.)

**Fuel, oil and other consumables.** (The discipline studies theoretical and practical questions of fuel properties, lubricants and other consumable (paints, adhesives, interior materials and the impact of the quality of technical and economic indicators of machines and equipment of agricultural and forestry production; develops the skills of definition of the basic indicators of the quality and selection of suitable varieties and brands of petroleum products, special liquids and other consumables.)

**Tillage mechanics.** (The methods of formalization of agricultural materials and environments and methods of construction of equalizations which describe co-operating with them of workings organs of machines of Agrarian complex with the purpose of determination of kinematics and dynamic parameters of workings organs are examined.)

**Theory of cutting, metal-working and instruments.** (The discipline studies a concept and deadlines for processing by cutting, physics and mechanics processes, construction and geometry of cutting tools and materials for their manufacture, construction of metal-cutting machines and accessories to them, and the types that do not run on them with a substantiation of rational cutting modes, discusses the physical and chemical processing of machine parts.)

**Bioenergy systems in livestock.** (Discipline examines concepts and terms regarding bioenergy systems that are used in animal husbandry, the structure of bioenergy systems, basic principles of their operation, the theoretical basis of calculation of their structural and energy parameters, technical and economic indicators of the use of bioenergy in livestock.)

**Reliability of agricultural machines.** (It is complex discipline which studies: engineering-physical bases of reliability of agricultural technique, test of machines are on reliability, methods of providing of reliability of agricultural machines, terms and determinations of the system of technical service and repair; technological processes of repair of machines; technologies of typical component, knots and aggregates overhaul; processes of loss and proceeding in the capacity of agricultural machines.)

**Constructing of agricultural machines.** (The discipline foresees the study of theoretical bases and basic methods of planning of competitive resource saving of agricultural machines, technological equipment and mechanized processes. A receipt of skills students is from the calculations of machines with the use of modern methods and computer programs, that will allow promote the technical and aesthetically beautiful level of machines, reduce their prime price.)

**Economic effectiveness of design solutions** (Studying the economic aspects of making design decisions in order to maximize the benefits. Auditory and practical classes on discipline envisage students mastering the economic foundations of production in agro-industrial enterprises.)

**Fundamentals of technics control.** (The discipline deals with the study of operating control of tractors and self-propelled agricultural purpose facilities, preparing them for the work and performance of agricultural machinery. Provided technical design capabilities tractors and units can be fully applied only at excellent learning and rational use of qualified control techniques in different engines conditions, which requires good knowledge of the structure and interaction mechanisms and systems of machines, rules of their maintenance and operation.)

### ***Optional Block 2 (Student's Choice)***

### ***Optional Block 3, „Equipment of forest complex”***

**Timber plant species.** (Educational discipline examines the wide circle of questions, which touch ecology, biology and technology of artificial forest renewing and propagation. Taking into account that most specialists of forestry industry work with artificially renewed forests, the primary objective of discipline is directed to study of new technologies of forest propagation considering the regional and local typical conditions of plantings.)

**Machines and equipment for forestry.** (Educational discipline studies the modern state, problems and prospects of development of engineer for forestry, types of modern tractors, intended for forestry, machines for collection and treatment of seed, machine for bringing organic-mineral fertilizers, sowing and forest-planting machines, machines for the deck-houses of care of the forest, for a fight against forest fires, and also machines for uprooting of stumps and export of them from a silvicultural area.)

**Theory of cutting, woodworking machine-tools and equipment.** (The discipline studies a concept and deadlines for processing by cutting, physics and mechanics processes, construction and geometry of cutting tools and materials for their manufacture, construction of woodworking machines and accessories to them, and the types that do not run on them with a substantiation of rational cutting modes, discusses the physical and chemical processing of wood.)

**Fuel, oil and other consumables.** (The discipline studies theoretical and practical questions of fuel properties, lubricants and other consumable (paints, adhesives, interior materials and the impact of the quality of technical and economic indicators of machines and equipment of agricultural and forestry production; develops the skills of definition of the basic indicators of the quality and selection of suitable varieties and brands of petroleum products, special liquids and other consumables.)

**Woods cutting and transporting.** (Educational discipline studies the question of technique and technology of purveyance of wood raw material, his roughing-out and supply to the users, acquaints with the methods of work in forestry at the tree felling of wood, to the effective forms of management of organization of labour at the use of new machines and mechanisms, to the decline of energy consumption and financial resources.)

**Designing of machines for forestry.** (In an educational course disciplines are examined substantive provisions of design are sciences about the artistic constructing of technique, his category, their property and quality. Facilities and methods of prosecution are studied of form, composition of machine; skills of development of characters of functions of control and management are obtained; students meet with the right of ownership on developments in industry of design and bases of its defence.)

**Using of machines for forestry.** (The study of discipline provides future specialists theoretical and practical knowledge on questions a technique and its exploitation in the new terms of technologies of purveyance of wood raw material, his roughing-out and supply to the users.)

**Standardization and certification of machines.** (General principles of standardization, metrology and certification of technique are expounded in discipline. It is reflected accordingly Principles of Ukraine on standardization, metrology and certification and national standards of basis of drafting of normative documents, technical requirements intended for forming, technological processes on making of technique and equipment, maps of control of their quality and standards of enterprise, the rules of the metrology providing of processes of estimation of quality of technique and their certification are resulted.)

**Basics of technology management** (The discipline deals with the issues of methods of studying the management bodies of self-propelled forest products, their preparation for work and work with forest machinery. Technical possibilities of tractors and aggregates provided by the design can be fully used only at excellent mastering and rational application of qualification methods of machine control in different conditions, for which it is necessary to know well the structure and interaction of mechanisms and systems of machines, rules of their service and operation.)

**Constructing of machines for forestry.** (The method of constructing of machines for forestry is examined, analytical pre-conditions of conformities to principle of workings processes of knots and units are grounded, and also dependences are set for determination of rational parameters and modes of operations of machines.)

**Economic efficiency of construction solutions.**(Technological processes of engineering tools intervention in the structure of living matter to change its properties in usefulness of the person are studied. Lectures and workshops on the discipline provide for students assimilating the basics of biofuel production process engineering in terms of agricultural enterprises).

**Reliability equipment of forest complex.** (It is complex discipline which studies: terms and determinations of reliability; engineering and physical bases of reliability of equipment of forest complex; mathematical theory of reliability; there is a reliability test of machines; methods of providing of reliability of equipment of forest complex. Purpose of discipline – to teach future specialists to provide reliability of equipment of forest complex during the set time on condition of optimum charges of financial and labour resources on their planning, production, exploitation, technical service and repair.)

**Technical maintenance of machines and equipment of forest complex.** (Discipline is the special scientifically applied to the cycle of professional preparation of specialist from constructing and design of machines. In discipline general principles of maintenance of the in good condition state and operability technique for users with the use of the preventive-maintenance system of technical service, basic principles of accompaniment of the constructed and made machines are expounded regulated normatively technical by a document on exploitation of machines, technical service, repair, by requirements to fuels and oils materials, by a nomenclature on made spare parts (numeration and authentication).

**Optional Block 2 (Student's Choice)****Optional Block 4 "Robotics and robotic systems and complexes"**

**Robot and UAV control systems.** The course focuses on the application of control theory in robotics. Topics to be covered include: an overview of classical and modern methods of control system development, such as PID control, status feedback, optimal control, adaptive control and hybrid system control; mobile robot control; controlling of with robot manipulators.

**Robot touch devices.** Learn the structure and operation of digital and analogue sensors. Special attention is paid to the methods of signal processing.

**Optimization of robot motion modes and UAV.** This course introduces you to modern methods of mode optimization. Setting and isolating optimization tasks on dynamic robot models. The influence of terminal and integral optimization criteria on the robots' movement is studied. On physical models of robots students implement the obtained optimal modes of motion.

**Operating systems and robot programming languages and UAV.** Discipline covers the problem of achieving the correct synchronization of robotic systems, which means ensuring that the system responds to real-time requirements. The course teaches how to plan real-time systems in theory using established mathematical methods and how to implement them in practice using common planning methods. Students will also learn how to program a C system using the FreeRTOS real-time core. It also examines future real-time systems, namely multi-core real-time systems.

**Fuel, oil and other consumables.** The discipline studies theoretical and practical questions of fuel properties, lubricants and other consumable (paints, adhesives, interior materials and the impact of the quality of technical and economic indicators of machines and equipment of agricultural and forestry production; develops the skills of definition of the basic indicators of the quality and selection of suitable varieties and brands of petroleum products, special liquids and other consumables.)

**Robot and UAV mechatronic systems.** The course is devoted to the presentation of the general initial basics of robotics for junior students as an introduction to their future specialty. The course covers a wide range of issues: from the classification of industrial robots, control systems, kinematics, means of adaptation of robots to robotic technological complexes used in various industries.

**Mobile platforms and robot drives.** The task of studying the discipline is to present the basic concepts and algorithms necessary for the development of mobile robots operating autonomously in complex environments. The main emphasis is on mobile and kinematic mobile work, perception of the environment, localization and cartography on the basis of probability map and motion planning. Lectures and exercises in this course include several types of robots, such as wheeled and tracked i-tracks and drones.

**Robot, manipulator and UAV dynamics.** In this course, students will learn how to develop dynamic models of robotic manipulators, mobile robots and drones (quadrotors). We will look at robot dynamics, path generation, motion planning and non-linear control, and develop real-time planning and control software modules for robotic systems. This course provides basic theoretical tools and allows you to develop control algorithms.

**Reliability of robotic systems.** It is a complex discipline studying: terms and definitions of reliability; engineering and physical foundations of reliability of robotic systems; mathematical theory of reliability; testing of machines for reliability; ways to ensure reliability of equipment. The purpose of the discipline is to teach future specialists to ensure the reliability of robotic systems within the established time at the optimal cost of material and labor resources for their design, production, operation, maintenance and repair.



**Calculation and construction of robots and manipulators.** Modern computer-aided robot design systems are being studied. Modern methods of calculation and optimization of robot construction. Methods of additive manufacturing of robot constructions.

**Economic efficiency of construction solutions.** The economic aspects of making construction decisions are studied in order to obtain maximum benefit. Auditorium and practical classes in the discipline provide for students to obtain the economic basics of production in the conditions of agro-industrial enterprises.

**Basics of technology management.** The discipline deals with the issues of methods of studying the controls of self-propelled agricultural machinery, robotic systems and complexes, their preparation for work and work with machinery. Technical capabilities of tractors and aggregates provided by the design can be fully used only at excellent assimilation and rational application of qualifying methods of machine control in various conditions, for which it is necessary to know well the structure and interaction of mechanisms and systems of machines, rules of their service and operation.

**Bachelor**  
**In speciality «CONSTRUCTION AND CIVIL ENGINEERING»**  
**Educational-professional program «Construction and civil engineering»**

Forms of Learning, licensed volume:

– fixed-time	50
– correspondence	50
Terms of Learning	4 years
Credits	240 ECTS
Language of instruction	Ukrainian
Qualification graduate	Bachelor (Technical) in Building

**Concept of Learning**

Knowledge, skills and professional skills of new generation in construction of agricultural and environmental systems based on modern standards of education adapted to requirements of the world's best educational programs for public and private sectors in Ukraine.

**Practical training**

passing study (trial, geodesic) and industrial (vocational, technical, industrial enterprises) practices recommended by 52 companies, including strategic partners: John Deere Ukraine, Ukraine Amaco; Knauf Ukraine, Astra.

**Approximate topics of Bachelor project**

1. Project of construction of rural, agricultural and environmental systems.
2. The project of building fortifications agricultural and environmental systems.
3. Development of technology for building production facilities in rural areas, agriculture and environmental protection facilities.
4. Development of technologies for inspection and testing of buildings in rural areas, agriculture and environmental protection facilities.
5. Evaluation of properties of metals and materials in the construction of rural, agricultural and environmental systems.
6. The development process and rationale of building machines for specific production conditions.
7. The development process and rationale mechatronic systems construction equipment.
8. Evaluation of the technical work of building machines (by brand) with the development of the process of recovery.
9. Justification measures to prevent accidents and injuries in production processes in construction.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

**Areas of employment of graduates**

receives basic higher education and can work in positions that correspond to 3rd and 4th levels of qualification according to state of professions: head (another supervisor) district (division) in construction, Head of Logistics, Head of CAD managers (stewards) in construction, engineer in architecture and engineering, head of construction team, squad chief mechanical engineer of use of construction equipment, technical service engineer, civil engineer, building inspector and fire safety.

**Bachelor`s Program and Curriculum  
in Specialty «Construction and civil engineering»  
Educational-professional program «Construction and civil engineering»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Physics	7	exam
CC 2	Descriptive geometry and engineering graphics	7	exam
CC 3	Higher Mathematics	10	exam
CC 4	Chemistry	3	test
CC 5	Theory of mechanisms and machines	4	exam
CC 6	Theoretical Mechanics	6	exam
CC 7	Mechanics of materials and structures	6	exam
CC 8	Construction technique	4	test
CC 9	Architecture buildings	8	exam
CC 10	Structural Mechanics	6	exam
CC 11	Bases and foundations	8	exam
CC 12	Fundamentals of design and construction business	4	exam
CC 13	Water supply and sanitation	3	test
CC 14	Construction technology	4	exam
CC 15	Metal structures	6	exam
CC 16	Reliability construction equipment	3	test
CC 17	Heat and ventilation	4	exam
CC 18	Building construction	4	exam
CC 19	Reinforced concrete and stone structures	7	exam
CC 20	The production base construction	3	test
CC 21	Organization of construction	7	exam
CC 22	Engineering calculation software	5	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian statehood	4	exam
OB 1.2	Ukrainian language (for professional purposes)	4	test
OB 1.3	Foreign language (for professional purposes)	6	test
OB 1.4	Philosophy	4	exam
OB 1.5	Labour protection (Integrated)	4	exam
OB 1.6	Computers and computer technology	3	test
OB 1.7	Ethnocultural	5	test
OB 1.8	Science of law (integrated)	3	test
OB 1.9	Introduction to the profession	3	test
OB 2.0	Physical training	-	test
<b>The volume of components of the general training cycle</b>		<b>156</b>	
<b>Optional Block 2 (Disciplines offered by students)</b>			
OB 2.1.1	Fundamentals of management, marketing and entrepreneurship	3	test
OB 2.1.2	Engineering geodesy (general rate)	5	exam
OB 2.1.3	Engineering geology soil mechanics and foundations	3	test
OB 2.1.4	Building materials	6	exam
OB 2.1.5	Construction economy	3	test
OB 2.1.6	Inspection and testing of buildings	4	test
OB 2.1.7	Seismology	3	test
OB 2.1.8	Basics of computer-aided design in construction	4	exam
OB 2.1.9	Software engineering calculations	3	test
OB 2.2.0	Technical maintenance and repair of buildings	5	test
OB 2.2.1	Engineering geodesy (general rate)	3	test
OB 2.2.3	Modern building materials	5	exam
OB 3.1.1	Constructions of wood and plastic	3	test

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 3.1.2	Metals and welding in construction	3	test
OB 3.1.3	Engineering structures	5	exam
OB 3.1.4	Organization of construction	6	exam
OB 3.1.5	Metrology and Standardization	5	exam
OB 3.1.6	Electrical construction	3	test
OB 3.1.7	Computers and computer technology	3	test
<b>3. OTHER TYPES OF TRAINING</b>			
CC 4.1	Military training course		
CC 4.2	Driver training		
CC 4.3	Educational studying, geodesic	9	
CC 4.4	Educational technological	9	
CC 4.5	Industrial production	9	
CC 4.6	Production at construction enterprises	9	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>263</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Physics.** (The discipline studies properties of the material world, a variety of physical phenomena, principles of co-operation and motion of material bodies, and also processes and mechanisms for their control, called to form students' analytical and modelling thinking. A student acquires physical knowledge during the process of mastering of physical concepts, principles, and theories for the further learning general technical disciplines.)

**Descriptive geometry.** (Discipline studies dimensional forms and methods of their image on a plane, examines the methods of construction of images and methods of decision of dimensional tasks by these images. The study of discipline allows developing dimensional thought and capacities for the analysis of geometrical forms, forms skills of construction of volume graphic models, operation by draft as the mean of graphic information transfer. Mastering knowledge of descriptive geometry provides further study of such disciplines as engineering and computer graphics, machine parts and machines, theoretical mechanics, etc., helps to increase the level of execution of drawings of course and diploma projects.)

**Higher mathematics.** (The study of this discipline allows learning to use mathematical (analytical) methods for description and study of physical, technical, technological and other processes. Knowledge of the systems of linear equalizations, basis of vector algebra, equalizations of line and plane in space, basic formulas and theorems of differential and integral calculation, substantive provisions and methods of decisions of differential equalizations will allow to decide and analyse the systems of linear equalizations, decide the tasks of analytical geometry and mathematical analysis, apply knowledge in practice, ground decision, conduct the analysis of decision, apply mathematical methods to the decision of the applied technical and technological tasks.)

**Chemistry.** (Fundamental discipline «chemistry» provides students of knowledge about composition, structure, properties and transformations of matters, which are basis of construction materials, and knowledge of terms of protracted, saving, ecologically – safe exploitation of machines and systems of natural resources using. The study of chemistry provides a basis for training students professionally – the oriented and special disciplines and it promotes forming of modern world view of a man.)

**Theory of mechanisms and machines.** (The discipline studies bases of research, calculation and planning of the mechanical systems, devices, mechanisms and equipment in the conditions of editing, exploitation and unitization of working machines in modern agricultural building, and also general methods of structural, kinematics and dynamic analysis and synthesis of mechanisms and machines of agricultural technique.)

**Theoretical mechanics.** (The discipline studies general acts and principles of mechanical motion, equilibrium of material objects, mechanical systems and existent methods and facilities of solving tasks, drafting of calculation models of the real technical objects.)

**Mechanics of materials and constructions.** (The discipline studies the methods of engineering calculations of machine details, elements of construction on durability, inflexibility and firmness in the conditions of action of the static and dynamic loadings recognition change of temperature and processes, related to duration of exploitation at simultaneous reliability, longevity and economy.)

**Construction technique.** (Forming students knowledge of modern construction machinery, equipment and power tool, learning basic types of design solutions and construction machinery and equipment, their use in industry, development of skills of self-selection sets of machines and equipment considering type of work and conditions of use.)

**Architecture of Buildings and Constructions.** (Develop students' creativity, their creative ideas can be realized only in material form in products and structures made of concrete materials to teach properly select materials for buildings on which building material is made in tree or rock, metal or concrete in monolith, depends on architectural appearance and design solution and cost, terms and conditions for use of building.)

**Structural Mechanics.** (Forming students knowledge of structural mechanics, kinematics analysis systems statically definable structure, movable load calculations, general theorem on elastic system, statically undetectable system, spatial rod systems, numerical methods for calculation of elastic metal structures; terms in calculation of strength of metal construction machinery, accounts for strength of metal structures of road vehicles beam type; calculations for strength metal frame type structures, lattice calculations of metal structures, metal structures calculated in form of beams, walls, plates and shells, estimates of strength of major components of cars, free vibrations of mechanical systems machines, forced oscillations, dynamics of problem is not oscillatory systems.)

**Bases and foundations.** (Deepening knowledge of soil properties of different origin, composition and condition; better knowledge of soil properties change under influence of external factors, accounting contemporary theoretical developments in field of soil mechanics, accounting practices foundation of modern construction. The student should be able to: carry out selection framework to assess IHU construction site, type, construction and main dimensions of foundation, based on IHU construction site, perform calculations compatible bases and foundations as one of parts of building; create technical drawings on your PC using one of common graphics packages according to requirements of state standards, know: method for determining type of soil on basis of research and design characteristics of soil, Foundations of shallow and deep foundations lay, basis of calculation bases for boundary condition (I, II), requirements of national standards for design bases and foundations.)

**Fundamentals of design and construction business.** (Forming students knowledge about selection of effective design solutions for high-level design, general information about buildings and structures, their classification, basic concepts with definitions of basic requirements for buildings and their components, classification of construction and design of buildings and main provisions of unification, standardization and modular coordination in building size, foundation and underground construction solutions foundations of buildings, designs exterior and interior walls of buildings to meet

modern standards, requirements, classification and design solutions for ceilings, floors, roofs and roofs of buildings, foundation design of industrial single and multi-storey buildings, principles of choice of space-planning and design decisions related to functional purpose and placement processes, the formation of master plans.)

**Water supply and sanitation.** The formation of future professionals with the skills and knowledge of modern methods of design, construction and operation of water and wastewater populated cities, residential and industrial projects (basic provisions and requirements of state standards for water and wastewater systems, classification and basic characteristics of systems and schemes of water supply and wastewater settlements, residential and industrial projects, principles and choice of scheme water and wastewater facility; basic principles of sanitation equipment of buildings and structures, the definition of the design of the fence, water supply and preparation of different water quality requirements, the definition of the design of drainage and sewage from different customers).

**Construction technology.** To deepen students' knowledge of theory, and acquire skills to make independent technological and organizational solutions in terms of installation of precast concrete structures, design technology and comprehensive mechanization of assembly processes.

**Metal structures.** Forming students knowledge about elements of metal, mixed frames of industrial buildings – beams, girders, trusses, girders, columns, connections, etc.; sheet structures, which include large-diameter pipelines, storage capacity for liquids (tanks), gas (gas holders), granular materials (bunkers and silos), construction and installation of steel, refineries, chemical plants, energy facilities (protective shell and carrying domain, air, distillation columns, reactors, etc.), high-rise buildings – towers and masts line radio and Tellez communications, networks, power, drilling tower, surveying marks, smoke and vent pipes, construction road and rail bridges, viaducts companies, moving bridge structure, tower and gantry cranes, large excavators, hydraulic structures, etc.; multi-frame (tall) civic buildings; span roof construction of hangars, shops aircraft, shipbuilding and engineering, laboratories, public buildings (theaters, concert halls, markets, indoor stadiums, exhibition halls), other structures, which impose special requirements, eg related to space exploration, nuclear energy and so on.

**Reliability construction equipment** (Discipline that studies: terms and definitions of reliability; engineering and the physical basis of reliability of building structures; mathematical theory of reliability; reliability testing; ways to ensure reliability. The purpose of discipline - to train future professionals to ensure the reliability of objects within a specified time with optimal costs of material and labor resources for their design, manufacture, operation, maintenance and repair.)

**Heat and ventilation** (Consolidate theoretical knowledge on properties of moist air, consolidate theoretical knowledge construction process heating and cooling with constant and variable moisture content, fixing basic assumptions of theory of heat transfer, familiarity with method of calculating value of thermal resistance of enclosing structures of buildings and determining heat loss room, determine estimated cost of heat for heating, ventilation and hot water, execution trace heating systems and selection of diameters pipelines heating system.)

**Building construction.** (To acquaint students with basics of building: with individual products and design elements that are part of buildings, with appointment of structures and relationships between them, with the basic requirements that apply to structural elements of buildings and buildings themselves taking into account specific conditions of use.)

**Reinforced concrete and stone structures.** (Entry students knowledge of methods of calculation, design, construction and operation of concrete and masonry structures, taking into account requirements for reliable and safe operation, efficiency and environmental friendliness of these structures.)

**The production base construction.** (Learn basics of technology and manufacture of building materials, structures and products, identify areas of production base construction, to teach technical and economic parameters to perform selection process diagrams, raw materials and equipment.)

### **Optional components**

#### ***Optional Block 1 (University Choice)***

**Ukrainian language (for professional purposes)** The purpose of the discipline is to improve the level of general language training, communicative competence of students, practical mastery of the basics of Ukrainian language stylistics, will ensure professional communication at an appropriate level. The discipline is designed to generalize and systematize knowledge of the Ukrainian language, to form skills and abilities for optimal speech behavior in the professional sphere.

**History of Ukrainian statehood** Study course provides a deep understanding of student learning and the history and formation of the Ukrainian people and Ukrainian statehood, strengthening national identity, political coverage classes and social groups in Ukraine at certain stages of historical development. Total calling rate is based on processes that humanization of higher education, professional integration and socio-humanitarian training, improved content structure of the course, the achievements of world and domestic opinion, human values, carry out training of highly qualified specialists agriculture.

**Foreign language (English, German, French).** Study course develops the students' communicative competence, namely the use of skills, abilities and knowledge of a foreign language in the course of business relations with other countries on various issues related to business and the labor market in agriculture, preparations for participation in international conferences , projects and discussions, and presentations, a written exchange of business information (formal and informal letters, resumes the different types of research articles and reports), contributing thus inconsistency student's development and socialization in a foreign language society.

**Philosophy.** The course is taught a system of knowledge of these parts of philosophy as ontology, epistemology (theory of knowledge), social philosophy, philosophy of historical types, revealing the nature of relations "man - the world" in its most basic forms. The course is marked ideological orientation that allows to synthesize the knowledge gained in professional and humanitarian disciplines in a holistic worldview - a theoretical basis for university level training.

**Physical education.** The purpose of teaching the discipline is to form a physical culture of a young specialist and the ability to implement it in social and professional training and in the family. The objective of the discipline is to strengthen the health of students and the development of physical abilities corresponding to the professional activity of a future specialist.

**Labour protection.** Forming students' knowledge of the legal and regulatory framework for safety; state guarantee conditions and safety; management and supervision of work and its organization in the workplace; training on safety; investigation and registration of accidents, occupational diseases and accidents; stimulation of safety and responsibility for its violation.

**Computers and computer technology.** As required educational and professional program students must be able to: build a comprehensive axonometric drawings and three-dimensional images of objects; intsydentnist solve problems on two geometric figures (point, line, plane surface); solve problems at the intersection of two geometric shapes (straight, plane surface); find the distance between geometric shapes and angles between them; for a given law education to build projection points of curves and surfaces; perform cuts and cross sections of complex geometric shapes; find life-size oblique sections; execute engineering

and construction drawings for YESKD standards; Know: Principles and methods of projection images; positional methods for solving problems; methods for solving metric problems; methods of formation of curves and surfaces; YESKD state standards.

**Ethnocultural.** Discipline studies the patterns of development and functioning of the cultural life of society, the mechanisms of formation of ethnic, managing cultural processes. In the discipline are considered main stages of the world and national culture, social organizations and movements in the socio-political and cultural life of the community, identity and politics, political culture, global cultural process.

**Introduction to the profession.** Introducing students to the basics of building as complex production process. Trace the entire construction process from design work linked to the area, construction management, training and provision of necessary equipment, in fact the process of construction of modern technologies, ordering the construction area, communication software structure and more.

### **Optional components**

#### ***Optional Block 2 (Student's Choice)***

**Fundamentals of management, marketing and entrepreneurship.** Formation of the ability to solve professional issues; formation of practical skills in organizational design, financial resources management, etc.; to teach to make appropriate and reasonable managerial decisions, to analyze the generalizing economic performance of a construction organization, to defend their point of view adopted decisions, to lead a discussion. Formation of legislative base for creation and running own business.

**Engineering geodesy (general rate)** Learning contents and main directions of geodetic activities, mastering basic methods of surveying, geodetic surveys, development of surveying instruments.

**Engineering geology.** Graphically display lithologic composition of rocks area, describe the terrain, perform analysis and assessment of current state of geophysical environment, perform long-term weather conditions and changes that occur in geophysical environments and forms of relief for a long time to carry out individual sections of engineering and survey reports in construction.

**Building materials.** Study of fundamental properties of building materials and their changes in operating conditions, study range of building materials and their production technologies, study of relationship of features "structure - structure - property" as well as their patterns of changes in physics-chemical, physical, mechanical and other effects and to identify effective construction materials field functionality.

**Construction economy.** Formation of future professionals building management system specialized knowledge and practical skills in field of construction economics, planning indicators of industrial and economic activities, use of economic management construction company based on factors external and internal environment.



**Inspection and testing of buildings** Preparation of bachelors and engineers builders who have deep knowledge of methods and tools for studying the basic properties of building materials, research and evaluation of the stress-strain state of constructions, buildings and structures in all production stages (from design to operation); are competent in organization systems, application methods and non-destructive quality control of construction products; oriented design scheme in construction of buildings, perfectly aware of the methodology of experimental research, know and be able to apply appropriate methods and means of measurement; capable of quality control in construction perform inspection and to test structures, buildings and facilities, to draw conclusions about their condition and the possibility of further exploitation.

**Seismology.** Study of theoretical knowledge about causes of emergence, spread and effects of earthquakes in seismically active areas of country on basis of current research activity of earth's surface motion of tectonic plates and continents. Installation and determine effect of mechanical waves on construction sites of various designs. Study and application of modern methods of increasing seismic.

**Basics of computer-aided design in construction.** Introduction to basic computer programs aided design of building structures, modern and review the latest software systems of calculation and aided design, introduction of integrated tools in the operating rd s Windows and MS Office, as well as in most software programming language VBA for Applications.

Software engineering calculations. Feasibility studies and calculations different variant solutions design, research organizations for different types of design.

**Modern building materials.** Formation of skills that allow you to make right choice of material based on operating conditions, provide cost savings in materials, weight and buildings, mastering theoretical basis of design

**Constructions of wood and plastic.** To teach students properly handled and hold works, use beams, purlins, studs, rafters, arches, frames, trusses, spatial span and special design.

**Metals and welding in construction.** Provide scientific principles and teach future professional bachelor properties of metals when used in technological processes of welding in construction industry.

**Engineering structures** To acquaint students with basics of building: with individual products and design elements that are part of buildings, with appointment of structures and relationships between them, with basic requirements that apply to structural elements of buildings and buildings themselves taking into account specific conditions of use.

**Organization of construction.** Gaining theoretical knowledge and practical skills that will be needed in practice. Interdependent system of training to perform certain types of work, installation and maintenance of general order on construction site, order and timing of works, supply all kinds of resources to ensure effectiveness and quality of certain types of work or construction projects.

**Metrology and Standardization.** Preparation Bachelor-builder who needs to know metrological support of production and main methods and means of measurement in engineering practice and familiarize yourself with legal framework of metrology and statistical analysis and evaluation of measurement errors. Familiar with methods of measuring linear displacements and deformations by mechanical and electromechanical devices, methods of measurement of mechanical quantities using electrical transducers, methods of non-destructive quality control and testing of buildings and structures. Familiar with basics of standardization.

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**Electrical construction.** Forming students' knowledge of electrical construction; linear range DC; linear range of single-phase alternating current; three-phase current; transformers; Electric machines DC; AC machines; low voltage switching equipment and relay; Electrical measurement; choice section of wires and cables; Safety in electrical installations.

## **2.10. EDUCATION AND RESEARCH INSTITUTE OF ENERGETICS, AUTOMATICS AND ENERGY SAVING**

**Director** – Doctor of Technical Sciences, Professor, Honored Worker of Science and Technique **Volodymyr Victorovych Kozyrskyi**

Tel.: (044) 527-85-80; E-mail: epafort1@ukr.net

Location: Building № 8, Room 11

The ERI organizes and coordinates Bachelor training in the following specialties:

### ***141 Power Engineering, Electrical Engineering and Electrical Mechanics***

Educational-professional Program «**Power Engineering, Electrical Engineering and Electrical Mechanics**»

Graduating departments:

Department of Automatics and Robototechnical Systems named after acad. I.I. Martynenko

Tel.: (044) 527-82-22, (044) 527-83-82

E-mail: avto.ea@gmail.com

Head of department – Doctor of Technical Sciences, Professor, Honored Worker of Education Vitaliy Lysenko

Department of Electrical engineering, electromechanics and electrotechnology

Tel.: (044) 527-87-55; (044) 527-87-89

E-mail: elmash\_nubip@ukr.net

Head of department – Doctor of Technical Sciences, Associate Professor Andrei Zhyltsov

Department of Power Supply named after Prof. V.M. Synkov

Tel.: (044) 527-85-80

E-mail: epafort1@ukr.net

Head of department – Doctor of Technical Sciences, Professor Andrew Nikiforov

Department of Heat and Power Engineering

Tel.: (044) 527-87-48

E-mail: gorobetsv@ukr.net

Head of department – Doctor of Technical Sciences, Associate Professor Valeryi Gorobets

### ***144 Heat power engineering***

Educational-professional Program «**Heat power engineering**»

Graduating department:

Department of Heat and Power Engineering

Tel.: (044) 527-87-48

E-mail: gorobetsv@ukr.net

Head of department – Doctor of Technical Sciences, Associate Professor Valeryi Gorobets

***151 Automation and Computer Integrated Technologies***

Educational-professional Program «**Automation and Computer Integrated Technologies**»

Graduating department:

Department of Automation and Robotics Systems named after acad.I.I. Martynenka  
Tel.: (044) 527-82-22, E-mail: avto.ea@gmail.com  
Head of department, Doctor of technical sciences, professor Lysenko Vitaliy Pylypovych.

**Bachelor**  
**field of knowledge "Electrical Engineering"**  
**in specialty «POWER ENGINEERING, ELECTRICAL ENGINEERING**  
**AND ELECTRICAL MECHANICS»**  
**Educational-professional Program**  
**«Power Engineering, Electrical Engineering and Electrical Mechanics»**

Form of Training:	Licensed number of persons:
– Full-time	150
– Part-time	150
Duration of Training	3 years 10 months
Credits	240 ECTS
Language of Teaching	Ukrainian
Qualification	Technician-Electrician

### Concept of training

The educational process is based on a systems approach and interdisciplinary training principles to foster students' broadmindedness non-standard thinking, the ability to solve overhead and socio-economic problems and meet the needs of modern production and the labor market.

### Practical training

Practical training is carried out in educational and research facilities of the university and the leading enterprises like poultry "Ukraine", "Kiev", "Havrylivski", Greenhouse "Pusha Vodytsya", PC "Kyyivsilelektro", PC "Kyyivelektromontazh", companies "Oblenergo".

### Proposed Topics for Bachelor theses

1. Autonomous system of animal energy complex using gas generator installation.
2. The set of measures to improve efficiency in diagnosing of electrical repair shops.
3. Electrification of technological processes in pigsties-vidhodivelnkyu.
4. Energy efficient heating system in greenhouse.
5. Microprocessor Protection System PL-10 kV.
6. Power supply of poultry farms from solar panels and connection to State Enterprise "Energorynok".
7. The project of reconstruction of transformer substation of Bila Tserkva CHP.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

### Employment of Graduates

Professionals trained to work in the following sectors: installation, repair and maintenance of electric motors, generators, transformers, electricity distribution and control apparatus, production and distribution of electricity, electric, electronic and optical equipment.

**Bachelor`s Program and Curriculum in Specialty  
"Power Engineering, Electrical Engineering and Electrical Mechanics"  
Educational-professional Program  
«Power Engineering, Electrical Engineering and Electrical Mechanics»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
OK1.	Higher mathematics	10	exam
OK2.	Engineering and Computer Graphics	8	exam
OK3.	Physics	4	exam
OK4.	Computer Technologies and Programming	4	exam
<b>Optional components</b>			
<i>Optional Block 1 (University Choice)</i>			
B5 1.1.	History of Ukraine	4	exam
B5 1.2.	Ukrainian Language (for professional purposes)	4	exam
B5 1.3.	Physical Education	8	tests
B5 1.4.	Foreign Language	4	exam
B5 1.5.	Philosophy	4	exam
B5 1.6.	Ethnic Culture	4	exam
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
OK5.	Computer technologies and programming	4	exam
OK6.	Fundamentals of thermodynamics and heat engineering	4	exam
OK7.	Electronics and Microchips	4	exam
OK8.	Electrotechnical materials	4	exam
OK9.	Electrotechnical systems of power consumption	4	exam
OK10.	Theoretical foundations of electrical engineering	8	exam
OK11.	Electric vehicles	4	exam
OK12.	Electric cars	8	exam
OK13.	Electric networks	4	exam
OK14.	Fundamentals of Automation	6	exam
OK15.	Electrical part of stations and substations	4	exam
OK16.	Microprocessor technology	4	exam
OK17.	Metrology and electrical measurements	4	exam
OK18.	The basis of the electric drive	8	exam
OK19.	Basics of electricity supply	4	exam
OK20.	Basics of relay protection and automation of power systems	4	exam
OK21.	Electronic devices in control systems	4	exam
OK22.	Economics and organization of the energy service	4	exam
OK23.	Energy efficiency and alternative energy sources	4	exam
OK24.	Mathematical problems in energy	4	exam
<b>the volume of components of the general training cycle</b>		<b>120</b>	
<b>Optional components</b>			
<i>Optional Block 1 (University Choice)</i>			
B5 1.7.	Safety of work and life	4	exam
B5 1.8.	Legal culture of personality	4	exam
B5 1.9.	Fundamentals of Entrepreneurship, Management and Marketing	4	exam
B5 1.10.	Fundamentals of scientific research	4	exam
<i>Optional Block 2 (Student's Choice)</i>			
B5 2.1.1	Software engineering and technical calculations	4	exam
B5 2.1.2	Hydraulics	4	exam
B5 2.1.3	Technology of production, processing and storage of agricultural products. products	4	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

BБ 2.1.4	Fundamentals of ecology of production, distribution and use of electricity	4	exam
BБ 2.1.5	Installation of energy equipment and control systems	4	exam
BБ 2.1.6	Fundamentals of Digital Control and Programming of Microcontrollers	4	exam
BБ 2.1.7	Industrial electronics and converters	4	exam
BБ 2.1.8	Machines and equipment for agricultural production	4	exam
BБ 2.1.9	Project management	4	exam
<i>Optional Block "Electric power industry "</i>			
BБ 2.2.1	Diagnosis of electrical equipment	4	exam
BБ 2.2.2	Fundamentals of technical operation of power equipment and control equipment	4	exam
BБ 2.2.3	Electric drive of production machines and mechanisms	4	exam
BБ 2.2.4	Fundamentals of energy objects design	4	exam
BБ 2.2.5	Technical service of energy equipment	4	exam
BБ 2.2.6	Heat power installations and systems	4	exam
<i>Optional Block " Electrical Engineering "</i>			
BБ 2.3.1	Diagnostics, maintenance and repair of electrical equipment	4	exam
BБ 2.3.2	Power equipment of power plants	4	exam
BБ 2.3.3	Reliability and design of electrical systems	4	exam
BБ 2.3.4	Transient processes in power engineering	4	exam
BБ 2.3.5	High voltage engineering	4	exam
BБ 2.3.6	Expert decision making systems in the energy sector	4	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>96</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
Educational Practice		<b>10</b>	tests
Industrial Practice		<b>5</b>	tests
Diploma Project		<b>9</b>	Protection of qualifying work
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**High Maths.** Analytic geometry, linear and vector algebra. Elements of field theory. Functions of a complex variable. Differential calculus. Elements of functional analysis. Integral calculus. Differential Equations. Sequences and series. Harmonic analysis.

**Engineering and Computer Graphics.** Descriptive Geometry. Terms and conditions kreslennya. Oformlennya circuitry.

**Physics.** Physical principles of mechanics. Fundamentals of molecular physics and thermodynamics. Electricity and magnetism. Elements of solid state physics. Optics. Nuclear Physics.

**Computer Technologies and Programming.** Computer architecture. Operating systems and software computing technologies. Systems and Technology Management database. Computer networks. Working in local area computer networks and the Internet. Basic programming and algorithmic languages. High-level programming languages. Mathematical package MathCAD. Programming in the mathematical package MathCAD. Computer graphics and image editors.

## Optional components

### *Optional Block 1 (University Choice)*

Annotations of disciplines “History of Ukrainian Statehood”, “Ethnocultural”, “Philosophy”, “Ukrainian for Professional Purposes”, “Foreign Language (English, German, French, Spanish)”, “Physical Training”, “Labour and Life Safety”, “Legal Personal Culture” see Section 2.1.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Electrical Apparatus.** Manual control devices. Automatic switches. Electromagnetic starters, contactors. Devices of protective shutdown. Hybrid electric vehicles. Electromagnets. Vacuum breakers.

**Electrical Machines.** Electrical Machines DC. Transformers. Asynchronous machines. Synchronous machines.

**Electronics and Microcircuitry.** Element base electronics. Electronic devices. Amplifiers. Sensors. Regulators.

**Electrical Materials** Dielectrics. Conductor and semiconductor materials. Magnetic materials and materials for electronic devices.

**Electrotechnical Systems of Power Consumption.** Basic usage and sources of optical radiation. Lighting installation and networks. Irradiation installation. Physical and technological and electro-physical properties of agricultural products and materials. Methods of electrical heating. Electric equipment and its calculation. Electro-technological methods of cultivation of agricultural products.

**Metrology and Electrical Measuring.** Analog gauges. Digital gauges. Methods and tools for measuring electrical, magnetic and non-electrical quantities. Metrology and metrological activities.

**Foundations of Automation.** Automation systems and elements. Means of automation. Linear systems of automatic control. Nonlinear and optimal automatic control.

**Fundamentals of Electricity Supply.** Parameters calculation. Electrical power systems: operation, structure, purpose and choice. Monitoring, protection and control of electrical networks. Reliability, quality and efficiency of power supply systems.

**Fundamentals of Electric Drive.** Mechanical and Electrical Specifications DC motors and AC. Transients in electric drives. Adjust the coordinate drive. Power drive. Choice of electric vehicles and electric control and protection. Scheme electric. General procedure for selecting drive.

**Fundamentals of Heat Engineering.** Fundamentals of Heat Mass Transfer. Thermal power plants and the application of heat in agriculture.

**Theoretical mechanics.** Theoretical mechanics. Theory of mechanisms and machines. Mechanics of materials and structures. Machine parts

**Theoretical Foundations of Electrical Engineering.** DC circuit. AC circuit. Turn on the RL, RC, RLC circuit on a sinusoidal voltage. Three-phase three-and four leading range of AC. Asymmetry in power grids and measures for its reduction. Asymmetrical loading three-phase transformer and power losses. Transients in electrical circuits.



## Optional components

### *Optional Block 1 (University Choice)*

**Safety of Labour and Activity.** Safety system "man - technology - environment." General concepts of analysis and risk assessment. Means and security measures. Public administration and supervision of Safety. failure of the system. Direct and indirect assessment of harm to people and the environment. Assessment of environmental and social risks of adverse effects.

**Mathematical Problems of Energetics.** Analytical methods of mathematical modeling of production facilities. The models of typical objects construction based on the experiment results. Algorithms of realization of models on computers. Euler, Runge-Cutta's algorithms.

**Fundamentals of Scientific Research.** Methodological foundations of scientific research organization. The specificity of research activities. Total research methodology. Principles of scientific information. General requirements for the design and writing scientific works.

**Fundamentals of AIC Energy Objects Design.** Methods of design of electrification, automation and energy in agriculture. Computer technologies in design. Requirements for the project.

### *Optional Block 2 (Student's Choice)*

**Hydraulics.** Hydrostatics and hydrodynamics. Hydraulic machines. Basics of agricultural water supply and sanitation.

**Diagnostics of Power Equipment.** Methods for determination electrical equipment reliability. Various types of electrical equipment operational reliability. Control methods electrical equipment operability. Device providing of the test measurements and tests of electrical equipment. Modeling of emergency operating modes. Algorithms of troubleshooting technical products.

**Electrical Part of Stations and Substations.** Circuit breakers. Contactor. Devices of emergency shutdown. Olives switches. Vacuum switches. Gas circuit breakers.

**Electronic Devices in Control Systems.** Development and debugging of microprocessor systems in agricultural production. Discrete signals, their coding. DAC and ADC. The synthesis of digital systems.

**Electric Drive of Industrial Machinery and Mechanisms.** Driving characteristics of machines and mechanisms. The principles and control of electronic circuits. Complete equipment for automatic control. Experimental methods of driving characteristics.

**Special electric machines.** Feeding machines. Processing enterprises. Systems and equipment of poultry farms. Machines for mechanization of agricultural work.

**Mounting of Energy Equipment and Control Systems.** Working drawings for Electroinstallation works Instruments, machinery and tools for electric installation works. The main types of electric installation works technology implementation. Planning and organization of electrical work.

**Ecological Fundamentals of Production, Distribution and Use of Electrical Energy.** Applied aspects of ecology. Ecological problems of Ukraine and its regions. Strategy and tactics of conservation and sustainable development of life on Earth. Fundamentals of theoretical ecology. Strategy and tactics of conservation and sustainable development of life on Earth.

**Basics of Business, Management and Marketing.** HR management system in the organization. Analysis and quality of staff turnover. Plan of personnel. Methods of recruitment and selection, assessment of motivation and professional development.

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**Fundamentals of AIC Energy Objects Design.** Sources of heat. Burning of fossil fuels. Boiler systems. Heat generators. Heating systems. Heating networks. Gas supply of agriculture. Alternative sources of heat supply in agricultural production.

**Basics of Technical Operation of Energy Equipment and Control Facilities.** Legal and regulatory principles and operating power equipment problems. Power equipment in agriculture, optimization and reliability. Maintenance and repair of power equipment. The organization commissioning, acceptance testing and operation of rural energy.

**Industrial Electronics and Transforming Equipment.** Passive components of electronic circuits. Diodes and their models. Transistor schemes. Feedback. The operational amplifier. Characteristics of logic integrated schemes families. Digital microcircuits.

**Technical Service of Energy Equipment.** Maintenance and repair of electrical equipment. The organization commissioning, acceptance testing and operation of rural energy. Maintenance of transformer substations and transmission lines.

**Technology of Production, Storage and Processing of Agricultural Products.** Technologies crop production. Technology of production of livestock and poultry. Technologies of processing and storage of crop production, livestock and poultry.

**Economy and Energy Services Organization.** Economic efficiency of investment in the energy sector. The economic mechanism. Scheduling and wages in the energy sector. Revenue, profitability, financial activities in electricity. Energy planning. Recovery costs of fixed income.

**Bachelor  
field of knowledge "Electrical Engineering"  
in specialty «HEAT POWER ENGINEERING»  
Educational-professional Program «Heat Power Engineering»**

Form of Training:	Licensed number of persons:
– Full-time	50
– Part-time	
Duration of Training	3 years 10 months
Credits	240 ECTS
Language of Teaching	Ukrainian
Qualification	Technician-Electrician

### **Concept of training**

The educational process is based on a systems approach and interdisciplinary training principles to foster students' broadmindedness non-standard thinking, the ability to solve overhead and socio-economic problems and meet the needs of modern production and the labor market.

### **Practical training**

Practical training is carried out in educational and research facilities of the university and the leading enterprises like poultry "Ukraine", "Kiev", "Havrylivski", Greenhouse "Pusha Vodytsya", PC "Kyyivsilektro", PC "Kyyivelektromontazh", companies "Oblenergo".

### **Proposed Topics for Bachelor theses**

1. Modernization of the energy supply system of the greenhouse economy using energy-saving technologies.
2. Development of an energy supply system for an energy-saving farmhouse.
3. Improvement of the microclimate system in poultry houses using alternative energy sources.
4. Power supply of the pig farm using a biogas plant.
5. Reconstruction project of the district heating boiler with the use of solid fuel boilers.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

The specialists are ready to work in the following branches of the economy: installation, repair and maintenance of heat and power equipment, generators, transformers, heat-distributing and control equipment; production and distribution of heat energy, production of heat and power equipment.

**Bachelor`s Program and Curriculum in Specialty  
"HEAT POWER ENGINEERING"  
Educational-professional Program «Heat Power Engineering»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
OK1.	Foreign Language	6,0	exam
OK2.	Philosophy	3,0	exam
OK3.	History of Ukraine	3,0	exam
OK4.	Ukrainian for Professional Purposes	3,0	exam
OK5.	Safety and life	3,0	tests
OK6.	Physical Education	10,0	tests
OK7.	High Maths	14,0	exam
OK8.	Physics	10,0	exam
OK9.	Engineering Graphics	3,0	exam
OK10.	Computer Technologies and Programming	3,0	exam
OK11.	Theoretical mechanics.	3,0	exam
OK12.	Chemistry	3,0	tests
<b>Optional components</b>			
<i>Optional Block 1 (University Choice)</i>			
B5 1.1.	Introduction to speciality	3,0	exam
B5 1.2.	Ethnocultural	3,0	tests
B5 1.3.	Energy-saving technologies and use of energy resources	4,0	exam
B5 1.4.	Fundamentals of Scientific Research	3,0	tests
<i>Optional Block 2 (Student's Choice)</i>			
B5 2.1.	Software of Engineering Calculations	4,0	tests
B5 2.2.	Economy and Energy Services Organization.	3,0	tests
B5 2.3.	Legal Culture of Personality	3,0	tests
B5 2.4.	Energy audit of objects of electric and heat consumption	3,0	tests
B5 2.5.	Ecological Fundamentals of Production, Distribution and Use of Electrical Energy	3,0	exam
B5 2.6.	Basics of Business, Management and Marketing	4,0	exam
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
OK13.	Technical thermodynamics	10,0	exam
OK14.	Foundations of Automation	4,0	exam
OK15.	Fundamentals of electrical engineering and electromechanics	3,0	exam
OK16.	Hydro-gas dynamics	8,0	exam
OK17.	Fundamentals of Heat Mass Transfer processes	8,0	exam
OK18.	Heat power installations and systems	8,0	exam
OK19.	Thermal power plants	4,0	exam
OK20.	Control and measuring devices and apparatus	3,0	exam
OK21.	Heat-technological processes in the processing of agricultural products	4,0	exam
OK22.	Heat supply, heating and ventilation systems	4,0	exam
<b>The volume of components of the general training cycle</b>		<b>120</b>	
<b>Optional components</b>			
<i>Optional Block 1 (University Choice)</i>			
B5 1.5.	Fundamentals of Electricity Supply in Agroindustrial complex	4,0	exam
B5 1.6.	Accounting and regulation of energy costs	4,0	exam
B5 1.7.	Material science and technology of materials	3,0	exam
B5 1.8.	Alternative sources of thermal energy	4,0	exam
B5 1.9.	Fundamentals of maintenance and servise of power	4,0	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

	equipment		
ББ 1.10.	Design of systems of electric and heat supply of objects of agrarian and industrial complex	4,0	tests
<i>Optional Block 2 (Student's Choice)</i>			
ББ 2.7	Gas supply	3,0	tests
ББ 2.8	Water supply and drainage	4,0	tests
ББ 2.9	Fundamentals of Electric Drive	3,0	exam
ББ 2.10	Generation and transportation of electricity at power station	4,0	exam
ББ 2.11	Renewable sources of electric energy	3,0	tests
ББ 2.12	Electronics and Microprocessor Technics	3,0	tests
ББ 2.13	Thermal networks	4,0	tests
ББ 2.14	Accumulation of thermal and electric energy	4,0	exam
ББ 2.15	Diagnosis and maintenance of power equipment	3,0	tests
ББ 2.16	Modeling of heat transfer processes and hydrodynamics	4,0	exam
ББ 2.17	Electrical Technologies in Agriculture	3,0	tests
<b>The volume of components of the special (professional) training cycle</b>		<b>120</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
Educational Practice		<b>10</b>	tests
Industrial Practice		<b>5</b>	tests
Diploma Project		<b>9</b>	defense of Bachelor work
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Foreign Language.** The purpose of discipline is to develop the students' foreign language communicative competence and realization in the process of studies teaching, education and development of the student's personality. The task of this discipline is to acquire language, linguistic and cultural knowledge and to develop a system of speech skills in speaking, reading, writing and listening. As a result of studying this discipline the student must be able to: freely use active material in various types of speech activity; to understand the main content of the texts on the frequently used topics in the everyday environment; to speak simply and linked on familiar topics or personal interests, describe experiences, events, hopes, dreams and ambitions, give concise explanations and proofs of points of view and plans.

**Philosophy.** Philosophy, its purpose, content and function in society. Ancient philosophy, its cosmocentric orientation. Philosophy of medieval society, its geocentricism. The philosophy of the New Age (XVII- XVIII c.), Its main paradigm - the study of nature. German classical philosophy. Traditions and peculiarities of the development of philosophical thought in Ukraine. The modern world philosophy. The problem of being (ontology). Spirit and matter, the limit of opposites. Dialectics as a general concept of development and its alternatives Nature, person, practice. Consciousness, its structure. The problem is perfect. Epistemology. The main content of cognitive activity. Forms and methods of scientific cognition. The doctrine of truth. Philosophy and Methodology of Social and Economic Cognition. Society as a developing system. Social progress. The dialectic of the integrity and contradictions of the modern

world. The problem of man in philosophy. Values and their role in the life of society. Progress and problems of the present.

**History of Ukraine.** Early history of Ukraine, culture of the primitive era and Slavic tribes. Kievan Rus and its place in the history of the Ukrainian people. Ukrainian lands in Lithuania and Poland (XIV-XVI centuries). Liberation War of the Ukrainian people in the middle of the XVII century. Situation of the Ukrainian lands in the Russian Empire and the Polish–Lithuanian Commonwealth in the late XVII-XVIII centuries. National-cultural revival in Ukraine in the late XVIII-XIX centuries. The development of Ukrainian lands in the Russian and Austrian empires in the late XVIII - XX centuries. National democratic revolution in Ukraine and cultural processes (1917-1920). Political, social, economic and cultural development of Ukraine in the interwar period. Ukraine during the Second World War. Political and socio-economic development of Ukraine in the second half of the 40's - the first half of the 80's of the twentieth century. The formation of independent Ukraine. Political and socio-economic development of independent Ukraine. National culture in modern Ukraine. Unity and interdependence of world and national cultures.

**Ukrainian for Professional Purposes.** Formation of knowledge of students about the foundations of the structure, features of the functioning of the language. Mastering the norms of modern Ukrainian literary language by every student, for whom the language is not a specialty, but a means of realizing knowledge of a particular specialty of the agricultural cycle. Mastering the styles of Ukrainian literary language, especially scientific and official-business. Familiarization with the most common scientific texts, peculiarities of their stacking. Developing the skills of drawing up documents with abundance of all requirements for registration. Mastering communication techniques in the field of oral business communication. Formation of ethical and aesthetic assessments of linguistic units and types of communication.

**Safety and Life.** Legislative and normative base of Ukraine on labor protection. State management of labor protection and organization of labor protection at work. Explosion of production, explosion protection. Fire Security. Electrical safety. Labor Hygiene and Industrial Sanitation. State supervision and public control over labor protection. Providing First Aid to Victims of Accidents.

**Physics.** Physical foundations of classical mechanics. Foundations of molecular physics and thermodynamics. Electricity and Magnetism. Physics of oscillations and waves. Optics. Basics of Atomic physics and Quantum mechanics. Principles of solid state physics. Theory of relativity. Basics of nuclear physics and nuclear energy.

**Physical Training.** The purpose of the discipline is the consistent formation of the physical culture of the personality of the specialist of the corresponding level of education (bachelor). As a discipline "Physical Culture" provides the realization of the goals and objectives provided by the program. Task of studying discipline - to teach students: to form an understanding of the role of physical culture in the development of personality and its preparation for professional activity, motivational and value attitude to physical culture, establishing a healthy lifestyle, physical development and self-education, the need for regular exercises; to form a system of knowledge of physical culture and healthy lifestyle, necessary in the process of life, training, work, family physical education; to master the system of practical skills and skills of occupation of the main types and forms of rational physical activity, maintenance, providing and preservation of health, development and improvement of psychophysical possibilities, qualities and personality traits.

**High Maths.** Elements of linear, vector algebra and analytical geometry. Differential calculus of function of one and several variables. Complex numbers. Transformation Laplas, numbers on orthogonal system, conformity between operations above originals and images. Integral calculus of function of one and several variables. Differential equations, differential equations systems. Numerical and functional numbers. The harmonious analysis.

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**Engineering and Computer Graphics.** Projection drawing. Looks, cuts and sections. Thumbnails and work drawings. Elements of structural joints. Assembly drawing. Detailing Drawing using the AutoCAD system. Areas of use of computer graphics. Basics of PC software computer graphics. AutoCAD automated drawing system. Setting up tasks for computer graphics. Fundamentals of graphical representation of information, graphic primitives and tools for editing CAD systems; the basis of solid-state modeling of parts.

**Computer Technologies and Programming.** Computer architecture. Operating systems and software computing technologies. Systems and Technology Management database. Computer networks. Working in local area computer networks and the Internet. Basic programming and algorithmic languages. High-level programming languages. Mathematical package MathCAD. Programming in the mathematical package MathCAD. Computer graphics and image editors.

**Theoretical mechanics.** Theoretical mechanics. Theory of mechanisms and machines. Mechanics of materials and structures. Machine parts.

**Chemistry.** Structure of atoms, molecules, substances, their modular condition. Chemical reactions. Solutions of electrolytes and non-electrolytes. Corrosion and protection of materials and alloys. Concept PH. Electrochemical processes.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

**Introduction to speciality.** The purpose of discipline is to study the main directions of training of heat energy specialists, the features of the future profession, the content and objectives of practical activities in the energy sector. The main disciplines studied during the preparation of bachelors are given and information on the necessary types of training of heat energy specialists is provided. Particular attention is paid to the current trends in the development of heat and power engineering, which affect energy saving and alternative energy sources. The discipline substantiates the formation of the primary knowledge of the main heat power engineering and ideas about the future work, the publication of the basic concept and terminology apparatus of heat power engineering and understanding of the ways of development of society.

**Ethnocultural.** Ancient culture of Ukraine. Introduction to discipline. Ancient culture of Ukraine. Pre-Christian beliefs of the Ukrainian people. Culture of Kievan Rus. Ukrainian culture: history and modern times. Ethno-cultural processes in the XIV-the middle of the XVII century. Ukrainian culture of the times of the Cossack-Hetman state (mid XVII - the end of the XVIII century.). Ukrainian Baroque. Culture of the Enlightenment. Culture of Ukraine in the late 19th and early 20th centuries. Ukrainian culture and XXI century.

**Energy-saving technologies and use of energy resources.** The purpose of discipline is mastering the basic principles and methods of energy saving, introduction of modern energy-saving technologies, modern approaches and challenges in the development, design and operation of energy-saving installations and systems. The discipline allows students to study renewable energy sources, calculate them and get acquainted with the establishment of automatic control of modern energy supply systems based on renewable energy sources.

**Fundamentals of Scientific Research.** Methodological foundations of scientific research organization. The specificity of research activities. Total research methodology. Principles of scientific information. General requirements for the design and writing scientific works.

**Optional Block 2 (Student's Choice)**

**Software of Engineering Calculations.** Electronics and Microprocessor Technics. Passive electronics. Semiconductor diodes, transistors, thyristors. Photovoltaic, optoelectronic and indicating devices. Electronic Amplifiers. Digital and pulse devices. Power supplies. Microprocessor devices. Microcomputer structure, microprocessor architecture, microprocessor command system, hardware microcontrollers, interrupt system, device matching with the object.

**Economy and Energy Services Organization.** Economic efficiency of investment in the energy sector. The economic mechanism. Scheduling and wages in the energy sector. Revenue, profitability, financial activities in electricity. Energy planning. Recovery costs of fixed income.

The general questions of estimation of energy efficiency of functioning of energy systems of agroindustrial complex, including those using renewable and secondary energy sources, are considered. The methods of determining the efficiency of power systems are described. The peculiarities and problems of financial and economic analysis of objects of agrarian and industrial complex are analyzed.

**Legal Culture of Personality.** Fundamentals of the theory of state and law. Fundamentals of Constitutional Law of Ukraine. Fundamentals of Labor Law of Ukraine. Fundamentals of Civil Law of Ukraine. Fundamentals of the inheritance law of Ukraine. Fundamentals of the Family Law of Ukraine. Fundamentals of Intellectual Property Rights. Fundamentals of Administrative Law of Ukraine. Fundamentals of Criminal Law of Ukraine.

**Energy audit of objects of electric and heat consumption.** Basic provisions of energy audit. Technologies and equipment used in conducting energy audits. Methodology and procedure for conducting energy audits of heat and power consumption objects. Making a report on energy audit. Development and substantiation of energy saving measures at the enterprise.

**Ecology.** Legal and organizational questions of natural environment protection. Theoretical bases of ecology. Global problems of ecology: problems of the population, power resources exhausting, the physical contents of " Greenhouse effect ", the physical contents of formation Ozone gaps. Concept of toxic substances. Hydrosphere protection. Atmosphere protection. Ecological monitoring systems. The agricultural production and its influence on the environment. Economic and legal aspects of rational wildlife management. Power and its influence on the environment. Bases of without waste technologies. Ecological examination of projects and technologies. Economic efficiency of nature protection actions.

**Basics of Business, Management and Marketing.** HR management system in the organization. Analysis and quality of staff turnover. Plan of personnel. Methods of recruitment and selection, assessment of motivation and professional development.



## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Terms.** Review of regulatory documents for construction. Approval of project documentation. Study of normative documents and standards. Quality and safety of electric and thermal installations. General states for the construction of electric and heat supply systems. Calculation of electrical loads of consumers in agriculture. Distribution of electric energy in electric networks up to 1000 V. Reserve power supplies. Calculation of electrical networks.

**Foundations of Automation.** Automation systems and elements. Means of automation. Linear systems of automatic control. Nonlinear and optimal automatic control.

**Fundamentals of electrical engineering and electromechanics.** The course "Electrical Engineering and Electromechanics" is a discipline for the fundamental training of engineers in electrical specialties. This science studies electrical and magnetic phenomena, the transformation of electrical energy into mechanical, the production of electrical energy and methods and means of its use. The purpose of the discipline is to familiarize students with the basics of modern electrical engineering, with the methods of calculating electrical circuits, with the principles of work of electromechanical converters, including with the principles of operation of electric machines of direct and alternating current, information micromachines. The tasks of the discipline are to: teach students to calculate electric and magnetic circuits in the steady and transient modes, to determine the characteristics of electric machines and to calculate effective and safe modes of their use. As a result of studying the discipline, the student must know the basics of the analysis of electric circuits of direct and alternating currents; the principles of the theory of quadrupole and its use; basic principles of the analysis of transients in electric circuits; the principles of electromechanical energy conversion; designs and principles of operation of electric machines (including micromachines). Student should be able to solve typical problems of analysis of electric circuits; to calculate transients in electric circuits; apply knowledge of the laws of electrical engineering and electromechanics for the efficient and safe operation of electromechanical transducers.

**Thermal power plants.** Structure of construction of thermal power plants. The main elements of thermal power plants and their interconnection. Thermodynamic and technological bases of thermal power plants. Study of the principles of functioning of steam and gas boilers, electric generators for the generation of electric energy. The main constructions of heat and power equipment and ways to improve the efficiency of the TPS are considered.

**Control and measuring devices and apparatus.** The legislative and normative acts in metrology. General problems of measurement and errors. The theory and practice of measurement precision and measurement systems. Analogue measuring apparatuses. Measuring mechanisms. Registering devices. Digital devices. Measuring of electrical and magnetic magnitude.

**Heat-technological processes in the processing of agricultural products.** The purpose of discipline is to form students' knowledge of the main processes of heat and mass transfer during the processing and storage of agricultural products, namely cooling processes, phase transformations and other processes. The principles of the devices for the processing of agricultural products are considered: dryers, shredders, refrigeration units, etc. The methods of thermal and hydraulic calculation of devices for processing and storage of agricultural products are considered. Acquaintance with modern methods and approaches in storage of agricultural products.

As a result of studying the discipline the student must know: the basics of the functioning of devices and industrial objects in the processing and storage of agricultural products, methods of their calculation and bases of operation.

**Heat supply, heating and ventilation systems.** The purpose of the discipline is to study heat supply, heating and ventilation systems for residential, public and industrial buildings. Systems of supply of heat to buildings, their distribution and methods of control of thermal conditions of premises, design of heating devices are studied. In addition, the basic principles of construction of ventilation and air conditioning systems for buildings and objects of various purposes are considered. The methods of calculation of heating and ventilation of buildings are given. Modern methods of energy saving for heating and ventilation of buildings are presented.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

**Fundamentals of Electricity Supply in Agroindustrial complex.** The discipline includes: general information on the production, transmission, distribution and consumption of electric energy; power supply tasks; reliability of power supply of enterprises and settlements; quality of electric energy in electric networks; electrical loads of networks; efficiency of electric networks; elements of electric networks; calculation of electric networks; voltage regulation in electric networks; calculation of air lines for mechanical strength; transients in electrical networks; reserve and non-traditional sources of electric energy; means of protection of systems of power supply from emergency modes of work; relay protection and automation of power supply systems.

**Accounting and regulation of energy costs.** Accounting for active and reactive electricity. Multi-tariff electricity accounting. Devices for recording and controlling the flow of heat-carrier. Automated systems for monitoring and accounting of energy costs.

**Alternative sources of thermal energy.** Discipline involves studying the possibilities of using non-traditional and renewable sources of thermal energy in power supply systems of industrial enterprises; systems of transformation of solar radiation into thermal energy; possibilities of using biomass and solid household wastes for the production of electric and thermal energy. The discipline creates students' knowledge in the field of renewable energy sources, the principles of constructing converters of various types of energy from renewable sources to heat energy, mastering the skills of calculating the main parameters of renewable energy converters, familiarizing with the modern world achievements in the development and implementation of renewable energy sources.

**Fundamentals of maintenance and service of power equipment.** Preparing students to work independently, making qualified decisions for the efficient operation of thermal power units and systems.

Formation of theoretical knowledge of the rules of operation of boiler plants, autonomous sources of thermal energy, thermal networks and gas economy; normative documents of technical operation of heat and power equipment, systems of heat and gas supply.

Providing students with practical skills to ensure the trouble-free operation of heat and power equipment and networks of heat and gas supply; taking appropriate measures in case of malfunctions in equipment operation, as well as in emergencies; solving issues of organization of repair works of boiler equipment and systems of heat and gas supply taking into account the requirements of ecology and rational nature management.

**Design of systems of electric and heat supply of objects of agrarian and industrial complex.** The main objective of the discipline is to develop knowledge and skills of specialists in the design of energy objects and systems, development of project documentation for network objects of electric and thermal power engineering and electric power stations, studying and calculation of parameters of schemes of electric and heat supply of consumers, studying of calculation methods for designing power objects, study of the state normative base necessary for execution and approval of the project documentation.

### ***Optional Block 2 (Student's Choice)***

**Heat Engineering.** The purpose of discipline is to form students knowledge of thermodynamic principles, methods and obtaining practical skills in the functioning and research of technological processes in heat and power systems and energy objects of agro-industrial production. When studying the discipline the student: acquaints with the state, the basic concepts and definitions of heat engineering, material flows and thermal energy; the main position of the operation of heat and power systems; analysis of typical (existing) technical solutions.

As a result of the study of the discipline, the student must know: the general principles of production, distribution and measurement of the cost of electric and thermal energy and material flows (gas, water, petroleum products, fuel resources); methods of formation and principles of saving of expenses of energy and material resources; the procedure for selecting technical means of automated control and accounting; construction and principles of the functioning of power systems and installations, management of distribution and consumption of energy and material resources;

The student should be able to: to identify the needs and normalize the energy and material resources, and select the technical means for the operation of power plants and systems and the consumption of energy and material resources.

**Hydro-gas dynamics.** The discipline involves the preparation of students for the independent solution of theoretical and applied problems of hydrodynamics, knowledge of the laws of hydraulics, principles of operation and design of hydraulic systems, the operation of hydraulic devices and machines used in rural, municipal and industrial spheres. Basic principles of construction and functioning of pumping and ventilation equipment, their calculation and bases of operation. Design, calculation and management of hot and cold water supply networks, choice of water pump equipment, cost accounting and water supply regulation. Basic application packages for modeling complex water supply systems, their features and purpose.

**Fundamentals of Heat Mass Transfer processes.** The discipline studies the basic processes of heat transfer and mass transfer in technological processes and energy devices and apparatuses. Different mechanisms of heat transfer are considered, namely, thermal conductivity, convective heat transfer, radiation transport, heat exchange during boiling and condensation. The basic equations and methods of calculation of heat and mass transfer processes are presented. The main heat energy devices used in the agroindustrial complex are considered.

**Heat power installations and systems.** The purpose of discipline is to form students' knowledge of the bases of functioning and principles of construction of thermal power plants and systems used in the agro-industrial complex. Tasks that are considered in the studied discipline: familiarization with the basic concepts, terminology and definitions used in thermal power plants; study of the principles of operation of thermal power plants, boiler-houses and cogeneration units, assimilation of methods for calculating thermal power plants, studying their constructions and bases of exploitation. Familiarization with modern methods and installations for the development of thermal and electric energy at agricultural facilities.

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As a result of studying the discipline, the student must know: the basics of the operation of heat and power plants and systems, energy management systems, methods of their calculation and bases of operation.

**Generation and transportation of electricity at power station.** Electric power systems, their structure and operative management. The main types of power plants. TPP and HPP. Main electrical equipment of stations and substations. Electric networks. Loss of voltage and power. Operating modes of electrical networks. Short circuits in electric power systems and short-circuit currents. Switching devices. Measuring transformers. Sources of operational current. Main circuits of connections of electric power stations and substations.

**Power equipment of power plants.** The purpose of discipline is to assimilate future electric engineers how to convert various types of energy into electricity and equipment, which ensures the implementation of such processes.

The main task of the discipline is to study the peculiarities of the use of power equipment of thermal power plants, nuclear power plants, diesel power stations, and to prepare students for the subsequent stages of training, as well as to practical activities in the production.

**Gas supply.** Discipline gives an opportunity to gain knowledge: in the field of gas supply to the agro-industrial complex, gas supply systems; gasification of rural settlements with natural gas; gasification of rural settlements by liquefied gas; the composition of gaseous fuel, its main characteristics of the basics of combustion of gaseous fuels. In addition, issues concerning gas supply of biogas plants, technologies and equipment for its receipt are considered.

As a result of studying the discipline, energy engineers should be prepared to solve the problems of development and reconstruction of the material and technical base of agricultural production and social development of the village in the field of gas supply to the agro-industrial complex.

**Diagnosis and maintenance of power equipment.** Normative and legislative basis of the energy service. System of maintenance and repair of electrical equipment. Diagnosing and maintenance of synchronous generators. Determination of the technical state and operation of electric power transmission devices: air and cable lines of power transmission, transformers, switchgears. Switching devices with voltage up to 1000 V. Exploitation and diagnostics of the electric drive. Organization and conducting of acceptance testing of electrical equipment.

**Renewable sources of electric energy.** The discipline is an important subject discipline, the main purpose of which is the students' awareness of the role of power systems using renewable sources of electrical power generation; assimilation of the complex of questions concerning the substantiation of the type and methods of selecting renewable power sources, their design features, electrical parameters; study of schemes and features of work of power plants. Lecture material includes: Scientific-organizational principles and directions for the implementation of power stations with renewable energy sources. Classification and basic technical and economic indicators. Investigation of the efficiency of the transformation of the intensity of the light flux into electricity by a photoelectric converter. Study of power supply circuits with photoelectric converters. Selection and substantiation of the parameters of the wind power and solar power station. Substantiation and calculation of hydroelectric power.

**Accumulation of thermal and electric energy.** The discipline in which accumulated knowledge of students obtained in the courses of physics, electrical engineering, surface physics, solid state physics, semiconductor electronics, micro and nanoelectronics and heat engineering. During the study of the discipline students learn about the basic physical phenomena, which are the basis of the work of different types of energy batteries, master the approaches to measure their working parameters, the skills

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of using modern software environments to analyze the results of measurements.

**Fundamentals of Electric Drive.** Mechanical and Electrical Specifications DC motors and AC. Transients in electric drives. Adjust the coordinate drive. Power drive. Choice of electric vehicles and electric control and protection. Scheme electric. General procedure for selecting drive.

**Electrical Technologies in Agriculture.** Electrical and magnetic fields Electrical circuits. Calculation of direct current electrical circuits Multi-poles network. Nonlinear circuits. Calculation of circuits at alternative currents and voltage. Transients in linear circles and their calculation. Calculations of nonlinear circuits. Transients in nonlinear circuits.

**Modeling of heat transfer processes and hydrodynamics.** In the discipline are considered the basic principles of mathematical modeling of heat and mass transfer processes occurring in heat and power equipment, agricultural and industrial objects. The basic equations describing the processes of heat and mass transfer and methods of their solution are considered. The bases of numerical calculation of integro-differential equations and their computer calculations are presented. The information on the main packages of applied programs for the calculation of thermal physical processes and the practical skills of working with such packages are given.

**Water supply and drainage.** The basic principles of water supply and drainage for settlements are considered. Principles of water treatment and transportation of drinking water to consumers are studied. The designs and functioning of the Rozhnovsky towers and the methods of treatment of drinking water in them are considered. The bases of sewage and water treatment of sewage are studied.

**Thermal networks.** The purpose of discipline is to study the basic principles of building thermal networks for the efficient transport of heat energy. The processes of transportation of heat carriers in thermal networks are considered. Thermal and hydraulic calculation of heating networks is carried out, types of insulation materials for pipelines and methods of their protection against destruction are considered. The ways of improvement of heat networks for minimizing heat losses during the transportation of thermal energy

**Bachelor**  
**field of knowledge " AUTOMATION AND INSTRUMENTATION"**  
**in specialty «AUTOMATION AND COMPUTER INTEGRATED TECHNOLOGIES»**  
**Educational Program «Automation and Computer Integrated Technologies»**

Form of Training:	Licensed number of persons:
– Full-time	50
– Part-time	50
Duration of Training	4 years
Credits	240 ECTS
Language of Teaching	Ukrainian
Qualification	Junior Engineer Automation and Computer Technologies

### Concept of training

The educational process is based on a systems approach and interdisciplinary training principles to foster students' broadmindedness non-standard thinking, the ability to solve overhead and socio-economic problems and meet the needs of modern production and the labor market.

### Practical training

Practical training is carried out in educational and research facilities of the university and the leading enterprises like poultry "Ukraine", "Kiev", "Havrylivski" Greenhouse "Pusha Vodytsya".

### Proposed Topics for Bachelor theses

1. Development of automatic control of temperature in the installation for the production of milk.
2. Development of automatic control of temperature in a pigsty, the mother liquor.
3. Development of automatic control of temperature in the greenhouse.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

### Employment of Graduates

Activities are subject to generalized systems of automation and computer-integrated technologies. Professionals trained to work in the following sectors: - Engineer with automated production management, Manager - informant - techniques of configuring computer systems.

**Bachelor`s Program and Curriculum in Specialty  
"Automation and Computer Integrated Technologies"  
Educational Program «Automation and Computer Integrated Technologies»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
OK1.	Ecology	3,0	exem
OK2.	High Maths	18,0	exem
OK3.	Numerical Methods	5,0	exem
OK4.	Physics	10,0	exem
OK5.	Chemistry	3,0	exem
<b>Optional components</b>			
<i>Optional Block 1 (University Choice)</i>			
B5 1.1.	History of Ukraine and Ethnocultural	4,0	exem
B5 1.2.	Ukrainian Language (for professional purposes)	4,0	exem
B5 1.3.	Philosophy	4,0	exem
B5 1.4.	Foreign Language	5,0	exem
B5 1.5.	Physical Education	10,0	exem
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
OK6.	Engineering Graphics	4,0	exem
OK7.	Computer Technologies and Programming	10,0	exem
OK8.	Electrical Engineering and Electromechanics	10,0	exem
OK9.	Electronics and Microprocessor Technics	10,0	exem
OK10.	Automation Systems Design	8,0	exem
OK11.	Theory of automatic Control	10,0	exem
OK12.	Technical Means of Automation	8,0	exem
OK13.	Metrology, Measurement Technology and Instruments	10,0	exem
OK14.	Identification and Modeling of Technological Objects	8,0	exem
OK15.	Automation of Technological Processes and Productions	7,0	exem
<b>The volume of components of the general training cycle</b>		<b>124</b>	
<b>Optional components</b>			
<i>Optional Block 1 (University Choice)</i>			
B5 1.6.	Safety and Life	4,0	exem
B5 1.7.	Computer Integrated Technologies	3,0	exem
B5 1.8.	Microprocessor Devices Control	4,0	exem
B5 1.9.	Automated Control Systems	3,0	exem
<i>Optional Block 2 (Student's Choice)</i>			
B5 2.1.	Information and Measuring Systems	4,0	exem
B5 2.2.	Computer Equipment, Networks and Systems	3,0	exem
B5 2.3.	Modeling and optimization of control systems	3,0	exem
B5 2.4.	Computer Integrated Technologies	7,0	exem
B5 2.5.	Computer Graphics	3,0	exem
B5 2.6.	Fundamentals of Systems Analysis	3,0	exem
B5 2.7.	Fundamentals of Management, Marketing and Entrepreneurship	3,0	exem
B5 2.8.	Theory of Information	3,0	exem
B5 2.9.	Technology of Production, Storage and Processing of Agricultural Products	4,0	exem
B5 2.10.	Theoretical and Applied Mechanics	3,0	exem
B5 2.11.	Electrical Technologies in Agriculture	4,0	exem
B5 2.12.	Hydraulics and Heat Engineering	3,0	exem
B5 2.13.	Fundamentals of technical operation of automation systems	4,0	exem
B5 2.14.	Executive Mechanisms of Control Systems	3,0	exem
B5 2.15.	Fundamentals of Scientific Research	3,0	exem

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

B5 2.16.	Politology and Sociology	3,0	exem
B5 2.17.	Economy of Automated Production in Agriculture	3,0	exem
B5 2.18.	Economic Theory	3,0	exem
B5 2.19.	Psychology	3,0	exem
<b>The volume of components of the special (professional) training cycle</b>		<b>65</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
Educational Practice		10,0	exem
Industrial Practice		5,0	exem
Diploma Project		5,0	Protection of qualifying work
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Ecology.** Legal and organizational questions of natural environment protection. Theoretical bases of ecology. Global problems of ecology: problems of the population, power resources exhausting, the physical contents of " Greenhouse effect ", the physical contents of formation Ozone gaps. Concept of toxic substances. Hydrosphere protection. Atmosphere protection. Ecological monitoring systems. The agricultural production and its influence on the environment. Economic and legal aspects of rational wildlife management. Power and its influence on the environment. Bases of without waste technologies. Ecological examination of projects and technologies. Economic efficiency of nature protection actions.

**High Maths.** Elements of linear, vector algebra and analytical geometry. Differential calculus of function of one and several variables. Complex numbers. Transformation Laplas, numbers on orthogonal system, conformity between operations above originals and images. Integral calculus of function of one and several variables. Differential equations, differential equations systems. Numerical and functional numbers. The harmonious analysis.

**Numerical Methods.** linear system of algebraic equations. Elementary transformation system. The algorithm of Gauss method and its application. Harmonic analysis. Methods of data processing.

**Physics.** Physical foundations of classical mechanics. Foundations of molecular physics and thermodynamics. Electricity and Magnetism. Physics of oscillations and waves. Optics. Basics of Atomic physics and Quantum mechanics. Principles of solid state physics. Theory of relativity. Basics of nuclear physics and nuclear energy.

**Chemistry.** Structure of atoms, molecules, substances, their modular condition. Chemical reactions. Solutions of electrolytes and non-electrolytes. Corrosion and protection of materials and alloys. Concept PH. Electrochemical processes.



## Optional components

### *Optional Block 1 (University Choice)*

Annotations of disciplines "History of Ukrainian Statehood", "Ethnocultural", "Philosophy", "Ukrainian for Professional Purposes", "Foreign Language (English, German, French, Spanish)", "Physical Training", "Labour and Life Safety", "Legal Personal Culture" see Section 2.1.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Engineering Graphics.** Projective drawing. Views, cuts and intersects. Sketches and working drawings. Assembly drawing. Detail drawing. The drawing by means of AutoCAD system.

**Computer Integrated Technologies.** Project of systems on the basis of personal digital computers and reference to the object, projection automation systems of programmed logical controllers, computer-aided design and modeling of the electronic chips.

**Electrical Engineering and Electromechanics.** Electrical and magnetic fields Electrical circuits. Calculation of direct current electrical circuits Multi-poles network. Nonlinear circuits. Calculation of circuits at alternative currents and voltage. Transients in linear circles and their calculation. Calculations of nonlinear circuits. Transients in nonlinear circuits.

**Automation Systems Design.** Automation circuits, choice of methods for complex technical automation facility during designing and automation system analysis.

**Programming and Algorithmic Languages.** Algorithmic languages and methods of programming. Application of algorithmic languages. Bases of programming low -level and high.- level languages Application of programming in engineering activity.

**Metrology, Measurement Technology and Instruments.** The legislative and normative acts in metrology. General problems of measurement and errors. The theory and practice of measurement precision and measurement systems. Analogue measuring apparatuses. Measuring mechanisms. Registering devices. Digital devices. Measuring of electrical and magnetic magnitude.

**Identification and Modeling of Technological Objects.** The classification of technological and manufacturing processes as objects of automatic control. Construction of static and dynamic objects of agricultural technological processes and production.

**Automation of Technological Processes and Productions.** Classification and structure of the modern atomic technological processes; the basic automatic characteristics of standard technological processes; automation problems in standard technological processes; automation of specific standard technological processes.

### Optional components

**Safety and Life.** Safety in system „ a person-technic-environment ". The concept of the human factor. General provisions of the analysis and risks estimation. Logic construction of events. Quality – the safety category. Means and actions of safety. The passport of substance, materials safety. The passport of object risk.

**Automated Control Systems.** Classification and structure of modern ACS; types of supply of ACS; ACS of specific objects and production processes in animal-husbandry,

plant-growing and fodder production; the functional automation schemes; formulation of problems of ACS.

**Psychology.** Psychology of societies Principles of Constitutional Law Jurisprudence Ukraine Ownership.

**Theory of Information.** Entropy as indeterminate system status. Entropy and information. Methods of coding information. Information and code length, that provides desired reliability under designed noise level. Computation of channels capacity and control.

**Fundamentals of Scientific Research.** The content and principles of scientific researches. The program and research methods. The scientific report. Introduction of researches into production.

**Economy of Automated Productions in Agriculture.** Basic and turnover funds. Material and technical supply of AIC. Profit and profitability. Inter-economic planning. Organization of designing, mounting and operation of power engineering objects. Rate setting, wages and salary.

**Electrical Technologies in Agriculture.** Electrical and magnetic fields Electrical circuits. Calculation of direct current electrical circuits Multi-poles network. Nonlinear circuits. Calculation of circuits at alternative currents and voltage. Transients in linear circles and their calculation. Calculations of nonlinear circuits. Transients in nonlinear circuits.

**Hydraulics and Heat Engineering.** Thermal and state parameters. Thermal and dynamic processes. Thermodynamic processes. The first and second principle of thermodynamics. Humid air. Cycles of heat engines and refrigerator machines. Heat exchange theory. Heat conduction, Convection. Thermal radiation. Heat exchange devices. Thermal energy sources. Boiler plant. Heat generators. Physic of heat of agricultural buildings. Heating, ventilating, conditioning. Thermal product treatment. Renewable energy sources: solar energy, wind energy, biogas, energy conservation technologies.

**Computer Equipment, Networks and Systems.** Scope PCs and computer technology, the basics of the software, database management systems. Working in a computer network. Scan. Computer drawing among AutoCAD. Programming Languages.

**Fundamentals of System Analysis.** The basic concepts and definition of systems analysis. The basic methods, procedures, stages. Indication of management systems. Structural analysis of control systems. Subsystems and optimization of structure. Information characteristics of systems. Decision making.

## 2.11. FACULTY OF LAND MANAGEMENT

**Dean** – Ph.D., Associate Professor, **ievsiukov Taras Oleksiyovich**

Tel.: (044) 258-05-25 (24) E-mail: [ievsiukov\\_t@nubip.edu.ua](mailto:ievsiukov_t@nubip.edu.ua)

Location: Building № 6, Room 219

The faculty (ERI) organizes and coordinates the educational process of bachelors in the following specialty:

### ***193 Geodesy and Land Management***

Educational-professional program «**Geodesy and Land Management**»

Graduating departments:

Geodesy and Cartography Tel.: (044) 258-05-25 E-mail: [kovalchukip@ukr.net](mailto: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](mailto:Uzr_k@ukr.net)

Head of Department – Doctor of Economics, Professor Dorosh Ol'ha Stepanivna

Land-use Planning Tel.: (044) 258-05-25 E-mail: [martyn@nubip.edu.ua](mailto:martyn@nubip.edu.ua)

Head of Department – Doctor of Economics, Professor Martyn Andriy Hennadiyovych

Land cadastre Tel.: (044) 258-05-25 E-mail: [v\\_zayats@ukr.net](mailto:v_zayats@ukr.net)

Head of Department – Doctor of Economics, Professor Zayats Viktor Mefodiyovych

Geoinformatics and Aerospace Research of the Earth Tel.: (044) 258-05-25

E-mail: [kokhan\\_s@nubip.edu.ua](mailto:kokhan_s@nubip.edu.ua)

Head of Department – Doctor of technical, Professor Kohan Svitlana Stanislavivna

**Bachelor**  
**Field of knowledge "Architecture and building"**  
**in Specialty "GEODESY AND LAND MANAGEMENT "**  
**Educational-professional program «Geodesy and Land Management»**

Form of Training:	Licensed number of persons:
– Full-time	90 persons
– Part-time	85 persons
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian, English
Qualification	Bachelor in Geodesy and Land Management

### **The concept of training**

The concept of training specialists in the field of geodesy and land management, consists in the formation of systematic knowledge on topography, geodesy, photogrammetry, cartography, land management, geoinformation technologies. In the process of learning, students learn how to create a variety of cartographic materials: cadastral and topographical plans and maps, creating and filling databases for various geographic information systems, and also studying land-use planning, land cadastre and land law.

### **Practical training**

Curriculum of training on direction 193 - "Geodesy and Land Management" includes educational-practical training on: computer science and programming, topography, surveying, agriculture, photogrammetry and remote sensing, surveying for land management, and practical training in land management and land cadastre. The aim of the trainings is to provide skills of practical knowledge of students with modern methods, forms of organization and tools in their future profession, forming their professional skills to make their own professional decisions for work in the real world, education needs to systematically supplement their knowledge and apply them in their practice activity.

**Academic rights for graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Surveying for the compilation of topographic maps and plans, surveying work related to cadastre, mapping work and data collection, including the use of remote sensing, surveying work in industry and civil engineering, monitoring, economics and legal assessment of land and property.

The specialist may hold primary positions as technician or junior engineer.

**Bachelor`s Program and Curriculum in Specialty  
«Geodesy and Land Management»  
Educational-professional program «Geodesy and Land Management»**

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components of EPP</b>			
CC 1	Higher Mathematics	11	Exam, credit, exam
CC 2	Physics	10	Exam, exam
CC 3	Geoinformatics, Computer Science and Programming	9	Credit, credit, exam
CC 4	Geology and Geomorphology	4	Credit
CC 5	Electronic Surveying Instruments	4	Exam
CC 6	Economic theory	3	Exam
CC 7	Land Law	3	Credit
CC 8	Mathematical Methods and Models	3	Exam
<b>Optional components of EPP</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian statehood	3	Exam
OB 1.2	Philosophy	4	Exam
OB 1.3	Ukrainian Language for Professional Purpose	4	Exam
OB 1.4	Foreign Language (English, German, French, Spanish)	5	Credit, exam
OB 1.5	Physical Education	4	Credit, credit, credit, credit
OB 1.6	Labour and life safety	4	Credit
OB 1.7	Legal culture of personality	3	Credit
OB 1.8	Ethnocultural Studies	3	Credit
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components of EPP</b>			
CC 9	Topography	12	Exam, exam
CC 10	Topographic and Land Surveying Drawing	4	Credit, credit
CC 11	History of land Relations and Land Management	4	Credit
CC 12	Geodesy	10	Exam, exam, course project
CC 13	Mathematical Processing of Geodetic Measurements	4	Exam
CC 14	GIS and Databases	7	Exam
CC 15	Photogrammetry and Remote Sensing	9	Credit, exam
CC 16	Higher Geodesy	6	Exam
CC 17	Satellite Geodesy and Spherical Astronomy	6	Credit
CC 18	Land Cadastre	13	Exam, exam, exam, course project
OK 19	Land Planning	16	Credit, exam, exam, exam, exam
CC 20	Cartography	6	Exam
<b>The total amount of compulsory components</b>		<b>144</b>	
<b>Optional components of EPP</b>			
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1</b>			
OB 2.1.1	Soil Science and the Basics of Agrochemistry	4	Exam
OB 2.1.2	Planning of Local Roads	4	Credit, course project
OB 2.1.3	Statistical Methods in Land Management	3	Credit
OB 2.1.4	Fundamentals of Ecology	3	Credit
OB 2.1.5	Fundamentals of Agriculture and Plant Science	3	Exam
OB 2.1.6	Ingeneering Infrastructure of Territory	3	Exam
OB 2.1.7	Psychology	3	Credit
OB 2.1.8	Geodetic Works in Land-Use Planning	4	Credit, exam, course project

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.1.9	Land Resources Management	3	Exam
OB 2.1.10	Digital Maps and Plans	3	Credit
OB 2.1.11	Automated Land Cadastral System	3	Credit
OB 2.1.12	Rational Use and Conservation of Land	3	Credit
OB 2.1.13	Technologies of Land Productivity Restoration	3	Credit
OB 2.1.14	Town-Planning Cadastre	3	Exam
OB 2.1.15	Planning Residential Areas	3	Exam, course project
OB 2.1.16	Agroforestry Amelioration	3	Credit
OB 2.1.17	Remote Monitoring of Land Resources	3	Credit
OB 2.1.18	Investment Analysis	3	Credit
OB 2.1.19	Organization and Management of Production	3	Credit
<b>Optional Block 2.2</b>			
OB 2.2.1	Soil Science and the Basics of Agrochemistry	4	Exam
OB 2.2.2	Fundamentals of engineering geodesy	4	Credit, course project
OB 2.2.3	Statistical Methods in Land Management	3	Credit
OB 2.2.4	Fundamentals of Ecology	3	Credit
OB 2.2.5	Fundamentals of Agriculture and Plant Science	3	Exam
OB 2.2.6	Engineering Infrastructure of Territory	3	Exam
OB 2.2.7	Psychology	3	Credit
OB 2.2.8	Topographic and Geodetic Survey for Land-cadastral Works	4	Credit, exam, course project
OB 2.2.9	GNSS observations applied problems of geodesy	3	Exam
OB 2.2.10	Digital Maps and Plans	3	Credit
OB 2.2.11	Automated Land Cadastral System	3	Credit
OB 2.2.12	Rational Use and Conservation of Land	3	Credit
OB 2.2.13	Regional Geoecology Monitoring	3	Credit
OB 2.2.14	Town-Planning Cadastre	3	Exam
OB 2.2.15	Planning Residential Areas	3	Exam, course project
OB 2.2.16	Agroforestry Amelioration	3	Credit
OB 2.2.17	Remote Monitoring of Land Resources	3	Credit
OB 2.2.18	Thematic Land Mapping	3	Credit
OB 2.2.19	Evaluation of Relief Economic Suitability	3	Credit
<b>Optional Block 2.3</b>			
OB 2.3.1	Soil Science and the Basics of Geobotany	4	Exam
OB 2.3.2	Algorithms and Data Structures	4	Credit, course project
OB 2.3.3	Statistical Methods in Land Management	3	Credit
OB 2.3.4	Fundamentals of Ecology	3	Credit
OB 2.3.5	Fundamentals of Agriculture and Plant Science	3	Exam
OB 2.3.6	Global information resources in natural resources use	3	Exam
OB 2.3.7	Psychology	3	Credit
OB 2.3.8	Geoinformation Technologies	4	Credit, exam, course project
OB 2.3.9	Web Applications Development	3	Екзамен
OB 2.3.10	Digital Maps and Plans	3	Credit
OB 2.3.11	Automated Land Cadastral System	3	Credit
OB 2.3.12	Rational Use and Conservation of Land	3	Credit
OB 2.3.13	Managing of IT infrastructure monitoring systems	3	Credit
OB 2.3.14	Town-Planning Cadastre	3	Exam
OB 2.3.15	Planning Residential Areas	3	Exam, course project
OB 2.3.16	Agroforestry Amelioration	3	Credit
OB 2.3.17	Remote Monitoring of Land Resources	3	Credit
OB 2.3.18	Spatial Organization of Crop Rotations	3	Credit
OB 2.3.19	Designing of Geospatial Databases	3	Credit
<b>Total for elective part</b>		<b>60</b>	

3. ІНШІ ВИДИ НАВЧАННЯ			
CC 21	Military training course	29	
CC 22	Academic Practice	6	Credit
CC 23	Academic Practice	1,5	Credit
CC 24	Academic Practice	3	Credit
CC 25	Academic Practice	1,5	Credit
CC 26	Academic Practice	6	Credit
CC 27	Academic Practice	3	Credit
CC 28	Academic Practice	1,5	Credit
CC 29	Academic Practice	3	Credit
CC 30	Academic Practice	3	Credit
CC 31	Production Practice	6	Credit
State Attestation		3	Exam
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components of EPP

**Higher mathematics.** As a fundamental mathematical discipline, it learns the basics of mathematical analysis, linear algebra and linear programming. It contains mathematical tools for a thorough study courses: Mathematical Statistics, Risk Theory, Econometrics and Macroeconomics; it reviews integral calculus, theory of numbers. It is aimed at mastering basic mathematical techniques necessary to study biology, ecology, chemistry and physics, as well as special courses in subject areas.

**Physics.** The aim of the course is to show students a scientific view of the physical processes in the world, in the theoretical foundations of classical mechanics and molecular physics is based. Main methods of experimental study of the characteristics of mechanical motion, the theoretical basis of molecular physics are reviewed.

**Geoinformatics, Computer Science and Programming.** Discipline provides the theoretical knowledge and skills in using computer technologies by future surveyors in their practice. The structure of computers and principles of computer capabilities of operating systems, hardware, software, computers, Internet basics, HTML and create Web-pages, and basic techniques of office software package MS Office are reviewed.

**Geology and Geomorphology.** The discipline is a basic discipline that forms a comprehensive understanding of the peculiarities of the genesis, evolution and current state of geological environment within which there are individual organisms and populations. Course Objective: to form an idea of the geological features of the Earth's environment, the laws of its development, dynamics and stability in relation to human impact.

**Electronic Surveying Instruments.** The purpose of teaching "Electronic surveying instruments" is to obtain basic knowledge of complex physical phenomena and processes that underlie the operation of geodetic electronic devices and computers. The aim of the course is to develop the student theoretical and practical training for working with electronic devices that are used to determine the coordinates and heights of points the earth's surface, as well as other engineering surveying and cadastral works.

**Economics theory.** The object of discipline is to study the economic laws of social production, the rationale for the choice of entities optimal use of scarce resources in order

to most fully meet the growing needs of people. The aim of the course is to develop knowledge systems of economic relations in society, issues of efficient use of limited resources, the operation of the main components of the economic system, the development of students' economic thinking.

**Land Law.** Purpose of the discipline: the formation of future bachelors mastering a set of knowledge in the legal regulation of land relations knowledge and ability to analyze legal acts that regulate the possession, use and disposal of land by individuals and legal entities. The task of the study: to be able to apply the acquired theoretical knowledge in the field of land relations in the performance of production activities, practical tasks, specific professional situations in the possession, use and disposal of land.

**Mathematical methods and models.** Economic-mathematical modeling techniques in land is a special discipline in the training of engineers, surveyors, which aims to explore the theoretical principles and practical skills processing large volumes of information and adoption of science-based land management decisions on the use of economic-mathematical modeling methods and tools electronic computers. Students acquire the skills of self-modeling of economic processes related to the organization of rational land use in the development schemes and land management projects, and learn specialized software.

### **Optional components of EPP**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines "History of Ukrainian Statehood", "Philosophy", "Ukrainian for Professional Purposes", "Foreign Language (English, German, French, Spanish)", "Physical Training", "Labour and Life Safety", "Legal Personal Culture", "Ethnocultural", see Section 2.1.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components of EPP**

**Topography.** Objectives of the course is to build knowledge about the history of the formation and discipline contribute outstanding domestic and foreign scientists in the development of geodetic science and practice, the current understanding of the shape and size of the Earth, the coordinate system used in geodesy, modern surveying instruments for measuring angles, lengths of lines, calibration, organizing and conducting topographic survey of objectives for land use, land-cadastral use, data preparation techniques for the agricultural purposes, methods for making and fixing areas of design points and lines.

**Topographic and Land Surveying Drawing** study the linear and dashed graphics elements and techniques of drawing, fonts for land management projects, plans and maps, symbols (codes) for graphic design topographic, cadastral surveying and materials, graphic design materials and land cadastre, GIS technology of maps and plans; technology design projects land management plans and land use map in class graphics editors.

**History of land Relations and Land Management.** The discipline involves the study of the formation of land relations - from primitive society to modern socio-historical formations. Students learn the features of land relations and land use in the ancient world, in feudal times. The features of the formation of land market relations. Details the features of land surveying work performed at the time of the Russian Empire, the Soviet Union and the independence of Ukraine.

**Geodesy.** Objectives of the course is to build knowledge about and outstanding contribution to domestic and foreign scientists in the development of geodetic science and

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practice, the current understanding of the shape and size of the Earth, the coordinate system used in geodesy, modern surveying instruments for measuring angles, conducting topographic surveys during land management, execution of cadastral and other works, techniques for data preparation makes the nature of objects agricultural purposes, methods for making and fixing areas of design points and lines.

**Mathematical Processing of Geodetic Measurements.** The main purpose of discipline is to provide students with the necessary knowledge and skills needed to perform geodetic measurements and calculations, including during surveying work. Study subjects gives a theoretical knowledge and practical skills in the processing and resolution of surveying tasks to handle as a single value, and for the joint processing of many interconnected geodetic values.

**GIS and databases** consider the basic theory of GIS and database professionals surveyors. Discipline gives a basic theory of databases, the use of modern GIS and relational database systems in land, acquiring skills automated, storage, display, analysis, modeling spatially coordinated the design and content of databases, GIS for land management, particularly for the introduction and use of data from the state land cadastre.

**Photogrammetry and Remote Sensing.** Examines the nature and methods of remote sensing, the theoretical and practical issues related to the use of aerial and satellite imagery, as well as the essence of photogrammetric processes. In the study subjects, students receive the necessary knowledge of analytical and digital photogrammetry, image processing technology study in order to obtain certain products (cards, directories coordinates, etc.).

**Higher Geodesy.** Discipline "Higher Geodesy" examines modern methods for solving basic problems of geodesy based on the joint use of data of higher geodesy, astronomy, gravimetry and satellite geodesy. It consists of two main sections: "Spheroid geodesy" and "Physical Geodesy". The first deals with the solution of geometric problems on the surface of the ellipsoid, the theory of separate images of the surface of an ellipsoid on a plane and solve problems associated with the use of flat rectangular coordinates to geodetic works. The second examines questions that refer to the study of the figure of the Earth, its gravitational field and processing astronomical and geodetic networks.

**Satellite Geodesy and Spherical Astronomy.** It examines current methods for solving scientific and practical problems of geodesy, based on the use of data of space geodesy, astronomy, the theory of the gravitational field and satellite observations in solving the land. We study methods for processing photographic and radar surveys received satellites. We consider the issue using different coordinate systems needed to meet the challenges of satellite geodesy. Attention is paid to the study of satellite motion in the gravitational field of the Earth, including consideration of the impact changes in the physical characteristics of the planets and the outer (space) factors. We study the theory and practice of solving geometric and dynamic problems of satellite geodesy.

**Land Cadastre.** Purpose of the discipline is mastering the theoretical foundations of the land cadastre, composition and content of its components, the procedures for obtaining the necessary information and documents about the legal status of the land, their distribution by category and among land owners and land users, the organization of accounting quantity and quality of land , establishing comparative national economic value of land, the introduction of procedures for cadastral information during the project work, special surveys, study the legal, methodological, technical, organizational and practical aspects of the State Land Cadastre.

**Land Planning.** This discipline plays a leading role in training bachelor students on specialty "Geodesy Cartography and Land Management." Methodology and methods of rational use and protection of land, formation of different types of land use, delineation of political subdivisions, planning areas. We consider the territorial organization of agricultural and industrial production in the regions and ownership of land are studied. The course

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covers the overview of the requirements for land use at the national, regional and local levels.

**Cartography.** This discipline reveals the nature and properties of maps as models of the environment, their mathematical basis, methods of imaging, the issue of generalization, conclusion of maps and atlases, their classification, cartographic method of research, technology mapping. It generates students' ability to create works of various cartographic scale, scope and purpose of their use in teaching, research and practice.

### **Optional components of EPP**

#### ***Optional Block 2 (Student's Choice)***

##### ***Optional Block 2.1***

**Soil Science and the Basics of Agrochemistry** reviews the science of soils, their formation, structure, properties, patterns of distribution, formation and development of the main properties - fertility, the most rational of use of soil. It examines the soil as a natural body, as a means of production, the subject of human labor and its product.

**Planning of Local Roads.** Aim of the discipline - to give students knowledge that will allow them to find optimal solutions to problems related to the rational use of land resources in the planning and design of road network to meet the requirements of an effective area of farms, efficient implementation of production processes and land use, perform economic assessment placement of road network into account logistics movement and make technical design of local roads of lower categories.

**Statistical Methods in Land Management** - the fundamentals of using mathematical and statistical methods of land management and cadastre data using computer technology are reviewed.

**Fundamentals of Ecology.** The course introduces students to the main sections of modern ecological science: fundamental ecology, and environmental socioecology. Probable study biotic relationships between individual organisms and their populations, their interaction with the environment are shown. We consider the theory of the biosphere and ecosystems, problems and sources of energy flows in ecosystems, the problem of interaction between man and the environment, environmental ethics.

**Fundamentals of Agriculture and Plant Science.** Explores the theoretical and practical problems most rational use of arable land, agricultural landscapes, how to develop physical, chemical, biological and mechanical methods and techniques to improve soil fertility, crop yields and stability of agroecosystems. Crop science deals with the study of new varieties and hybrids of cultivated crops and wild plant species to the action of biotic, abiotic and anthropogenic factors of the environment, develops cultivation technology for yields with consistently high quality based on intensification, energy saving and environmental safety.

**Ingeneering Infrastructure of Territory.** The discipline involves the examination of placement within certain territories set of objects and structures, utilities and components contour reclamation of territory and internal organization of agricultural enterprises. The principles of rational distribution of elements of artificial arrangement, taking into account the economic needs. Students learn to develop design solutions aimed at the rational use and protection of land, increasing the efficiency and productivity of land resources.

**Psychology** - the course is aimed at making future specialist could feel confident, stepping into a profession. Knowledge about the features, principles and patterns of training and education of individual psychological characteristics of its formation and development of individual psychological characteristics that lead to specific behavior of the individual, its activities and communication, help to understand the deeper motives of

human actions, to regulate their relations with these and other problems are the focus of the course.

**Geodetic Works in Land-Use Planning.** Students learn the features of the existing geodetic materials that include significant examination of a particular area; work with involving geodetic surveying marks, topographical survey of existing underground utilities, and processing of the results.

**Land Resources Management** is a special discipline in the training of engineers and surveyors aims to know the nature and patterns of land management, research methods and management mechanisms. Each mode of social production, the level of productive forces and relations of production correspond to a definite system of land management, due to the dominant form of ownership of land and other means of production, as well as the inherent forms of land use. To properly understand the nature and basic ways of land management, to justify its maintenance and reveal patterns of changes in the specific conditions of the land system, it is necessary to trace the historical relationship management with other phenomena and specific historical experience.

**Digital Maps and Plans** cover the basics of digital mapping and the possibility of using GIS in digital maps. The compilation of digital maps and plans using ArcGIS 9.x is taught.

**Automated Land Cadastral Systems.** The discipline studying the basics of automated cadastral systems associated with information support of the State Land Cadastre (SLC). The elements SLC automated through the use of GIS technology.

**Rational Use and Conservation of Land.** Purpose of the discipline - the formation of skills independently analyze the state of land use, evaluate options for optimization, predict the development of degradation processes, develop measures to prevent, capture the general principles of management of land resources on specific soil and climatic conditions.

**Technologies of Land Productivity Restoration.** Purpose of the discipline - the formation of skills to analyze independently the quality of soil, to predict its changes under the influence of economic activity, to develop measures for optimizing the main parameters of soil fertility, the general principles of self-mastery and regain productivity of land in various natural and agricultural areas.

**Town-Planning Cadastre.** The aim of the course is to explore theoretical issues of inventory settlements and practical application of these issues in the conduct of basic and current land records in order to explore the land fund all towns - villages, towns, cities, reporting the presence and distribution of land settlement, located owned and providing for the use, preparation of a report on the availability and distribution of buildings (structures) settlement by the number of floors, wall material, technical equipment, for reasons of unsuitability for use; report on street road network location, network engineering settlement, carrying monetary value of the land settlements: functional zoning settlements, compiling balance of land settlements.

**Planning Residential Areas** gives knowledge about the basic objectives and planning of routes and reconstruction of villages, skills in drafting and planning of residential and industrial development zones, to use normative and methodological literature on the development of urban planning and apply their knowledge in drafting land use to set or change the boundaries of the settlement, the monetary evaluation of land settlements.

**Agroforestry Amelioration.** The discipline aims on study of steppe massive afforestation, creation of shelter forest belts, combating soil erosion, consolidation and development of the sands, mountain afforestation.

**Remote Monitoring of land resources** includes the study of the preprocessing and thematic processing of remote sensing (RS), the possibility of using remote sensing data for monitoring and management of land resources.

**Investment Analysis.** The content and methodological support of the discipline are aimed at developing students' knowledge and practical skills in analysis methods efficiency investment projects (primarily real investments) and implementation of agricultural enterprises investment strategies.

**Organization and Management of Production.** The purpose of studying the discipline is to equip students of non-economic specialties as future specialists in the national economy of Ukraine with theoretical and practical knowledge on the issues of efficient organization and management of agricultural production on the basis of market economy. The discipline highlights the features of a rational organization and management of production on the basis of entrepreneurial activity in agricultural enterprises of different forms of ownership and management - private enterprises, economic partnerships, agricultural production cooperatives, farms, etc.

### ***Optional Block 2.2***

**Soil Science and the Basics of Agrochemistry** reviews the science of soils, their formation, structure, properties, patterns of distribution, formation and development of the main properties - fertility, the most rational of use of soil. It examines the soil as a natural body, as a means of production, the subject of human labor and its product.

**Fundamentals of engineering geodesy.** The course is focused on obtaining the necessary knowledge on special engineering and geodetic works; development of reference plans-high geodetic networks, networks of the substantiation of shooting, distribution networks; topographic, special, executive removable when searching, building, exploitation and reconstruction of various objects; breakdown works and geodetic control of the construction of plane engineering structures and linear objects; high-precision take-off in a variety of projects using modern electronic equipment.

**Statistical Methods in Land Management** - the fundamentals of using mathematical and statistical methods of land management and cadastre data using computer technology are reviewed.

**Fundamentals of Ecology.** The course introduces students to the main sections of modern ecological science: fundamental ecology, and environmental socioecology. Probable study biotic relationships between individual organisms and their populations, their interaction with the environment are shown. We consider the theory of the biosphere and ecosystems, problems and sources of energy flows in ecosystems, the problem of interaction between man and the environment, environmental ethics.

**Fundamentals of Agriculture and Plant Science.** Explores the theoretical and practical problems most rational use of arable land, agricultural landscapes, how to develop physical, chemical, biological and mechanical methods and techniques to improve soil fertility, crop yields and stability of agroecosystems. Crop science deals with the study of new varieties and hybrids of cultivated crops and wild plant species to the action of biotic, abiotic and anthropogenic factors of the environment, develops cultivation technology for yields with consistently high quality based on intensification, energy saving and environmental safety.

**Ingeneering Infrastructure of Territory.** The discipline involves the examination of placement within certain territories set of objects and structures, utilities and components contour reclamation of territory and internal organization of agricultural enterprises. The principles of rational distribution of elements of artificial arrangement, taking into account the economic needs. Students learn to develop design solutions aimed at the rational use and protection of land, increasing the efficiency and productivity of land resources.

**Psychology** - the course is aimed at making future specialist could feel confident, stepping into a profession. Knowledge about the features, principles and patterns of

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training and education of individual psychological characteristics of its formation and development of individual psychological characteristics that lead to specific behavior of the individual, its activities and communication, help to understand the deeper motives of human actions, to regulate their relations with these and other problems are the focus of the course.

**Topographic and Geodetic Supply for Land-cadastral Works.** Topographic and geodesic which support land management is a special discipline in preparation for the master program "geodesic-mapping technology land management." In the process of mastering masters consider the following issues: the nature topographic surveying providing land and its components; surveying materials, their types; land drainage projects; surveying and topographical work for the needs of land use; engineering and surveying work for accounting and registration of land plots; Modern technologies of inventory of land; surveying the lands of environmental, health, recreational, historical and cultural significance; geodesic support sustainable water and forest management, planning and construction work.

**GNSS observations applied problems of geodesy.** The discipline of the application of satellite observations in solving applied surveying tasks , modern satellite methods for determining the coordinates of points , the general principles of the method of differential GNSS, factors affecting the accuracy of observation , construction and development of the state geodetic network using satellite navigation systems . The review also reference coordinate system used in satellite positioning techniques.

**Digital Maps and Plans** cover the basics of digital mapping and the possibility of using GIS in digital maps. The compilation of digital maps and plans using ArcGIS 9.x is taught.

**Automated Land Cadastral Systems.** The discipline studying the basics of automated cadastral systems associated with information support of the State Land Cadastre (SLC). The elements SLC automated through the use of GIS technology.

**Rational Use and Conservation of Land.** Purpose of the discipline - the formation of skills independently analyze the state of land use, evaluate options for optimization, predict the development of degradation processes, develop measures to prevent, capture the general principles of management of land resources on specific soil and climatic conditions.

**Regional Geoecology Monitoring.** The course covers the nature and scientific bases of regional geoecological monitoring and problems solved during monitoring research. Levels and functional structure of geoecological monitoring are characterized; the principles and implementation of algorithms geoecological monitoring of the environment are revealed. The expediency of using the results of previous geo-ecological research in the planning, selection and implementation monitoring objects monitoring studies is discussed. Methods of geoecological monitoring, observed parameters of the environment, especially the use of monitoring data in solving the environmental management and land management, land protection are characterized.

**Town-Planning Cadastre.** The aim of the course is to explore theoretical issues of inventory settlements and practical application of these issues in the conduct of basic and current land records in order to explore the land fund all towns - villages, towns, cities, reporting the presence and distribution of land settlement, located owned and providing for the use, preparation of a report on the availability and distribution of buildings (structures) settlement by the number of floors, wall material, technical equipment, for reasons of unsuitability for use; report on street road network location, network engineering settlement, carrying monetary value of the land settlements: functional zoning settlements, compiling balance of land settlements.

**Planning Residential Areas** gives knowledge about the basic objectives and planning of routes and reconstruction of villages, skills in drafting and planning of

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residential and industrial development zones, to use normative and methodological literature on the development of urban planning and apply their knowledge in drafting land use to set or change the boundaries of the settlement, the monetary evaluation of land settlements.

**Agroforestry Amelioration.** The discipline aims on study of steppe massive afforestation, creation of shelter forest belts, combating soil erosion, consolidation and development of the sands, mountain afforestation.

**Remote Monitoring of Land Resources** includes the study of the preprocessing and thematic processing of remote sensing (RS), the possibility of using remote sensing data for monitoring and management of land resources.

**Thematic Land Mapping.** The discipline deals with content and object of thematic mapping, especially thematic content of maps of land resources, use of thematic maps in land management activities, as well as issues relating to the application of thematic maps, atlases and cartograms in agricultural practice and during geodetic and cartographic works. Theoretical knowledge is reinforced by practical skills in electronic map editing using QGIS software.

**Evaluation of Relief Economic Suitability.** The course is devoted to coverage of issues related to the study of relief as the basis deploy for various human geospatial activities, including land use. The nature of the relief, its genesis, morphology, structure, development, resistance to anthropogenic influences, is characterized. Typing of relief and its elements, the influence on the structure and condition of the relief of natural and anthropogenic factors are shown. The criteria determining the eligibility of economic aptitude of relief are proposed. Forms and elements of landscape of different genesis and morphology for their different economic use suitability are evaluated. The risks, arise during non-compliance ecosafety economy in the relief of various genesis, morphology, stability and development stage, are characterized. The possibilities of using data on relief for solving land use and environmental problems are shown.

### ***Optional Block 2.3***

**Soil Science and the Basics of Geobotany.** The science of soils, their formation, composition, properties, patterns of distribution, formation and development of the main property - fertility, the most rational use of soil. The discipline describes the basic patterns of the structure and dynamics of natural and anthropogenic phytocoenoses, their classification and transformation, and various types of lands, as well as the coenotic phytoremediation of Ukraine in conjunction with the influence of abiotic and anthropogenic factors.

**Algorithms and Data Structures.** The aim of the course "Algorithms and Data Structures" is forming ideas about basic data structures and basic algorithms for processing geospatial data. The course is focused on the formation of students' skills: working with static and dynamic data structures, mastering the techniques of formalizing logic and computational tasks; the ability to create and explore the effectiveness of algorithms and decision on the application algorithms for searching and sorting data.

**Statistical Methods in Land Management** - the fundamentals of using mathematical and statistical methods of land management and cadastre data using computer technology are reviewed.

**Fundamentals of Ecology.** The course introduces students to the main sections of modern ecological science: fundamental ecology, and environmental socioecology. Probable study biotic relationships between individual organisms and their populations, their interaction with the environment are shown. We consider the theory of the biosphere

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and ecosystems, problems and sources of energy flows in ecosystems, the problem of interaction between man and the environment, environmental ethics.

**Fundamentals of Agriculture and Plant Science.** Explores the theoretical and practical problems most rational use of arable land, agricultural landscapes, how to develop physical, chemical, biological and mechanical methods and techniques to improve soil fertility, crop yields and stability of agroecosystems. Crop science deals with the study of new varieties and hybrids of cultivated crops and wild plant species to the action of biotic, abiotic and anthropogenic factors of the environment, develops cultivation technology for yields with consistently high quality based on intensification, energy saving and environmental safety.

**Global information resources in natural resources use.** Course consists of topics related to principles of organization and operation of computer networks, WWW, composition, structure and principles of search engines, basic methods of information search, advanced search. There is a study of basic resource conservation perspective, electronic and depository library, AgroWEB, Copernicus, GMES, GEOSS and other Internet resources. Students get practical experience in implementing effective information retrieval and organization of the research, selection of best practices research, and presentation of results.

**Psychology** - the course is aimed at making future specialist could feel confident, stepping into a profession. Knowledge about the features, principles and patterns of training and education of individual psychological characteristics of its formation and development of individual psychological characteristics that lead to specific behavior of the individual, its activities and communication, help to understand the deeper motives of human actions, to regulate their relations with these and other problems are the focus of the course.

**Geoinformation Technologies.** The aim of the course "GIS technology" is forming ideas about the foundations of the collection, storage, processing and distribution of geographic or spatially referenced information. The course is focused on the formation of students' skills: gathering geospatial data using different data sources, processing, analysis and visualization of geospatial data to make good decisions.

**Web Applications Development.** The aim of the course "Developing Web applications" is to develop knowledge for creation geographic information systems for the Internet. The course is focused on the formation of students' skills: design, development and support of WEB-applications on the Internet with the help of modern technology.

**Digital Maps and Plans** cover the basics of digital mapping and the possibility of using GIS in digital maps. The compilation of digital maps and plans using ArcGIS 9.x is taught.

**Automated Land Cadastral Systems.** The discipline studying the basics of automated cadastral systems associated with information support of the State Land Cadastre (SLC). The elements SLC automated through the use of GIS technology.

**Rational Use and Conservation of Land.** Purpose of the discipline - the formation of skills independently analyze the state of land use, evaluate options for optimization, predict the development of degradation processes, develop measures to prevent, capture the general principles of management of land resources on specific soil and climatic conditions.

**Managing of IT infrastructure monitoring systems.** The course includes study of theoretical knowledge in the development and management of IT infrastructure monitoring systems, as well as practical skills that enable to identify and minimize the costs of creating such systems. The structure, composition, objectives and importance of IT infrastructure monitoring systems as well as key processes of IT infrastructure are studied. There is methodology of building and managing IT infrastructure of monitoring systems.

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**Town-Planning Cadastre.** The aim of the course is to explore theoretical issues of inventory settlements and practical application of these issues in the conduct of basic and current land records in order to explore the land fund all towns - villages, towns, cities, reporting the presence and distribution of land settlement, located owned and providing for the use, preparation of a report on the availability and distribution of buildings (structures) settlement by the number of floors, wall material, technical equipment, for reasons of unsuitability for use; report on street road network location, network engineering settlement, carrying monetary value of the land settlements: functional zoning settlements, compiling balance of land settlements.

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**Remote Monitoring of Land Resources** includes the study of the preprocessing and thematic processing of remote sensing (RS), the possibility of using remote sensing data for monitoring and management of land resources.

**Spatial Organization of Crop Rotations.** The discipline observes means and measures to model the types and kinds of crop rotations, their spatial organization with GIS technology. The use of GIS for automation of processes based on surveying at the local level on the example of projects that provide environmental and economic assessment of crop rotation as well as land management are observed. The principles and stages of project development are shown in order to provide ecological and economic assessment of crop rotation and land management based on GIS

**Designing of Geospatial Databases.** Course consists of topics related to fundamentals of building an object-oriented database models and methodology for object-oriented analysis and design of complex database systems. There is a study using UML to construct a unified spatial database structure. Students get practical experience in object-oriented models of complex systems.



## 2.12. LAW FACULTY

**Dean** – Candidate of Science in Law, Associate professor **Yara Olena Sergiivna**

Tel.: (044) 259-97-25

E-mail: lawyer\_dean@twin.nubip.edu.ua

Location: building № 6, room 231

The faculty organizes and coordinates the educational process of bachelors in the following specialty:

### **081 Law**

Educational-professional Program «**Law**»

Graduating departments:

Theori and History of State and Law Tel: (044) 259-97-25

E-mail: historylaw\_chair @twin.nubip.edu.ua

Head of the department – Candidate of Science in Law, Associate professor, Kachur Vira Olegivna

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, Pidubnyi Oleksiy Yuriyovych

The Department of Administrative and Finance Law: Tel.: (044) 259-97-25

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

Head of the Department – Doctor of Law, Professor Kurylo Volodymyr Ivanovych

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 the Department – Doctor of Law, professor Yermolenko Volodymyr Mykhaylovych

The Department of International Law and Comparative Law: Tel.: (044) 259-97-25E-

mail: interlaw\_chair @twin.nubip.edu.ua

Head of the Department – Doctor of Law, Professor Ladychenko Viktor Valerijovych

**Bachelor  
Field of Knowledge "Law"  
in Specialty "LAW"  
Educational-professional program "Law"**

Form of Training:	Licensed number of persons:
– Full-time	160
– Part-time	90
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian
Qualification	Bachelor of Laws

**Concept of training**

Training of the qualified specialists in the field of law, who work for the establishment of supremacy of law in society and development of legal consciousness and legal culture of citizens. Education of the professional lawyer who can decide the issues of legal support of various spheres of public activities with a focus on agrarian, land and ecological relationship.

**Practical training**

During the training students fix and deepen the theoretical knowledge received in the process of studying of the fundamental and professional legal educational subjects and get skills of practical law enforcement. During the practical and production training students become participants of practical activities on the application of legal norms, observe and analyze various aspects of the lawyers-experts activity, learn how to take actions related to protection of rights and legal interests of physical and legal entities.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

The associate lawyers prepared within the programme have the possibility to work by profession in the authorities of public administration of Ukraine (public and local authorities), as well as at the enterprises, institutions and organizations as all-legal area of focus, and those that operate in different spheres of public life.

**Bachelor`s Program and Curriculum  
in Specialty «Law»  
Educational-professional program «Law»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Judicial and law enforcement authorities of Ukraine	4	exam
CC 2	Legal ethics	4	exam
CC 3	Latin	3	exam
CC 4	Theory of state and law	6	exam
CC 5	History of state and law of foreign countries	6	exam
CC 6	History of state and law of Ukraine	6	exam
CC 7	Basics of Roman Law	4	exam
CC 8	Logic	3	exam
CC 9	History of doctrines about state and law	4	exam
CC 10	Comparative law	4	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Philosophy	4	exam
OB 1.2	Ukrainian for professional purposes	4	exam
OB 1.3	Foreign language (English, German, French, Spanish)	5	exam
OB 1.4	Physical training	4	exam
OB 1.5	Labour and life safety	3	exam
OB 1.6	Ethnocultural	3	exam
OB 1.7	Information technologies	3	exam
The volume of components of the general training cycle		<b>70</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 11	Constitutional law of Ukraine	7	exam
CC 12	History of doctrines about state and law	7	exam
CC 13	Criminal law	8	exam
CC 14	Civil and family law of Ukraine	7	exam
CC 15	Administrative law of Ukraine	9	exam
CC 16	Criminal procedure	4	exam
CC 17	Economic law	4	exam
CC 18	Employment law	4	exam
CC 19	Land law	4	exam
CC 20	Economic procedure	4	exam
CC 21	Civil procedure	4	exam
CC 22	Environmental law	4	exam
CC 23	International law	4	exam
CC 24	Administrative procedure	4	exam
CC 25	Financial law of Ukraine	4	exam
CC 26	Agrarian law	4	exam
CC 27	Criminalistics	4	exam
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1</b>			
OB 2.1.1	Basics of the economic theory	5	exam
OB 2.1.2	Basics of Business Design	5	exam
OB 2.1.3	Religion studies	5	exam
<b>Optional Block 2.2</b>			
OB 2.2.1	Juridical psychology	4	exam
OB 2.2.2	Psychology of Management	4	exam
OB 2.2.3	Conflictology	4	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

<b>Optional Block 2.3</b>			
OB 2.3.1.	History of political and legal thought in Ukraine	5	exam
OB 2.3.2.	Legal thought in Ukraine	5	exam
OB 2.3.3.	Legal doctrines of the XX century	5	exam
<b>Optional Block 2.4</b>			
OB 2.4.1.	International and legal standards of human rights	4	exam
OB 2.4.2.	International defence of human rights	4	exam
OB 2.4.3.	Practice of European Court on Human Rights	4	exam
<b>Optional Block 2.5</b>			
OB 2.5.1.	Inheritance Law	5	exam
OB 2.5.2.	Residential Law	5	exam
OB 2.5.3.	Copyright law	5	exam
<b>Optional Block 2.6</b>			
OB 2.6.1.	Intellectual property law	5	exam
OB 2.6.2.	Notary in Ukraine	5	exam
OB 2.6.3.	Family Law	5	exam
<b>Optional Block 2.7</b>			
OB 2.7.1.	Law of social security	4	exam
OB 2.7.2.	Town planning right	4	exam
OB 2.7.3.	Recreational right	4	exam
<b>Optional Block 2.8</b>			
OB 2.8.1.	Advocacy Ukraine	4	exam
OB 2.8.2.	Prosecutor's supervision	4	exam
OB 2.8.3.	Medical jurisprudence and forensic psychiatry	4	exam
<b>Optional Block 2.9</b>			
OB 2.9.1.	European law	4	exam
OB 2.9.2.	Institutional law of EU	4	exam
OB 2.9.3.	National law of foreign countries	4	exam
<b>Optional Block 2.10</b>			
OB 2.10.1.	Banking Law	4	exam
OB 2.10.2.	Tax law	4	exam
OB 2.10.3.	Customs law	4	exam
<b>Optional Block 2.11</b>			
OB 2.11.1.	<b>Corporate Law</b>	5	exam
OB 2.11.2.	Housing law	5	exam
OB 2.11.3.	Exchange Law	5	exam
<b>Optional Block 2.12</b>			
OB 2.12.1.	International law of energy security	4	exam
OB 2.12.2.	International law of nuclear safety	4	exam
OB 2.12.3.	International maritime law	4	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>140</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 28	<b>Academic Practice</b>	<b>14</b>	
CC 29	<b>Production Practice</b>	<b>16</b>	
CC30	<b>State Attestation</b>	<b>1</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Judicial and law enforcement authorities of Ukraine.** The educational subject "Judicial and law enforcement authorities of Ukraine" gives general background information about public and private authorities engaged in law enforcement activities. In essence the educational subject is basic, as it gives knowledge, without which it is impossible to learn the material of the following legal educational subjects. Learning of this knowledge allows to understand more deeply the specifics of the activity of law enforcement authorities during the study of civil, criminal, economic and administrative procedures.

**Legal ethics.** Juridical deontology is a philosophical - legal science and academic discipline that reveals basic aspects of legal activity (scientific, academic and practical). Course "Legal ethics" enables students to gain basic knowledge of the requirements for professional and personal qualities of lawyers, as well as help shape the outlook lawyer. Particular attention is paid to the official and corporate ethics of lawyers in different specializations.

**Latin.** Study of Latin remains an essential part of the process of formation of specialist with higher education. A modern specialist must possess the skills of translation from Latin as the language of public educational function, this fulfills the role of an auxiliary subject as to qualification of specialist – legislator (representing a written sources of Roman law and international legislative language terminology). The aim of Latin course in the legal higher educational institutions is the mastery of the elementary grammar basics of Latin, to develop the ability to read and translate original legal text (medium difficulty), the accumulation of lexical stock with the help of dictionary, the ability to actually use legal terminology.

**Theory of state and law.** The theory of state and law is a social science of theoretic and legal character. It investigates the theoretic nature of functioning of such social phenomena as the state and law, and thus is a fundamental professional discipline which belongs to the basic training courses on getting higher legal education. The training program includes the legal concepts and categories relating to the theory of state and law. The purpose of this academic discipline is mastery by the students of a system of the general-purpose modern knowledge on regularities of emergence, development and functioning of state and legal phenomena at large.

**History of state and law of foreign countries.** The reform of modern Ukrainian society, fundamental changes in state legal institutions which occurred and are occurring, as well as other factors and factors that determine and will determine the necessity of increasing interest in the study of international reform experience, and solid approaches to the codification of the legislation. Academic discipline "History of state and law of foreign countries" will help students learn the facts and to identify patterns of emergence, development, decline, or death of various types of state and law in the specific historical conditions.

**History of state and law of Ukraine.** History of state and law of Ukraine is a compulsory educational subject in all higher education institutions and faculties of our country. Study of historical and legal heritage of the past generations gives an opportunity to understand more deeply the modern processes of state and legal construction, understand general regularities, main directions and prospects of development of state and legal institutions in the future. History of state and law of Ukraine aims to familiarize students with state and legal development of Ukrainian nation from ancient times to the

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present, including the historical types and forms of state and law, political institutions and legal institutions in their historical development, it considers also the role of the state and law in society.

**Basics of Roman law.** The education subject “the Basics of Roman law” is a compulsory subject in the curriculum of all higher educational institutions. The historical significance of Roman law for Ukraine is based on the fact that for a long time it in its classic and Greco - Roman (Byzantine) variants had influence on the the formation and development of the Ukrainian law and continues to influence the formation of the concept of law in Ukraine today. The goal of the course is to acquaint students with the legal culture of Ancient Rome, with the basic institutions of the Roman public and private law, and also show the influence of Roman private law on the development of modern global civil law and civil law of the Ukraine in particular.

**Logic.** The study of the science of logic provides the familiarization of the students with the logical theory of thinking and mastering the skills of logical analysis received in the process of study of the political knowledge and interpretation of the formalized language of the science of logic in the sphere of politics; identification of logic errors in reasoning with political content; development of political knowledge; proving of the political knowledge on the truth or refutation on the false.

**History of doctrines of state and law.** Formation of legal philosophy based on knowledge of different approaches and concepts to specific public-legal institutions of law in general. This is a subject of study discipline "History of doctrines of state and law". Discipline "History of doctrines of state and law" will allow students to explore the history of formation and development of ideas of law, the law of the state, the main public-legal institutions in the process of human civilization.

**Comparative law.** One of the major trends of modern law is intensification of integration processes, increasing of the international law influence. This encourages the active involvement of comparative law research. Comparative law as a branch of legal science has specific subject and method of scientific research: goal, objects, functions, structure, theoretical and methodological data. Its General part contains a basis of comparative law analysis of the modern law systems of the world as the main object of study. And a Special part shows the possibility of using a comparative law method in various fields of jurisprudence and legislation.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines “Ukrainian for Professional Purposes”, “History of Ukrainian Statehood”, “Foreign language”, “Philosophy”, “Physical Training”, “Labour and Life Safety”, “Ethnocultural” see Section 2.1.

**Information technologies.** The purpose of the discipline - formation of knowledge of students on the use of modern information technology for the successful implementation of information and communication in the management, which involves the mastery of knowledge and skills to work with applications running Windows, word processing, spreadsheet processors, the construction and administration of databases, create presentations.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Constitutional law of Ukraine.** Constitutional law of Ukraine is the leading branch and science of national law system in Ukraine. As a branch of the national law, it establishes and regulates, and as a science, it studies the fundamental social relations regarding the political-territorial organization of the country, its operation, the socio-economic system. This means that it formulates the scientific bases of establishment of Ukraine as a state, without which the latter cannot be optimally predictable.

**Criminal law.** The purpose of the criminal law studying is mastering by the students of knowledge of criminal law objectives, functions and principles; knowledge of the general conceptual framework of criminal law of Ukraine; ability to systematize and locate criminal legal norms; skills of the proper application of the common criminal law institutions in solving practical tasks; skills of the identification of crime signs in the committed act, the delimitation of crimes from other infractions; the ability to define the grounds and forms of criminal responsibility and the grounds of application of other measures of criminal-legal influence; the ability to perform a search and critical analysis of the materials of law-enforcement activities in solving specific practical problems; the ability to understanding the general directions of the criminal policy in Ukraine.

**Civil and family law of Ukraine.** Civil and family relations are the wide layer of public relations, which every human is constantly facing throughout life from birth every day. Participation in these relations is implemented through the ability to have and exercise civil and family rights and responsibilities. However, knowledge of own rights and responsibilities is not enough. We should know not only how to exercise them in everyday life, but also how to protect them against invasion. While studying this course the student acquires knowledge not only of the civil and family legislation system, but also the relevant theoretical provisions, without which it is impossible to thoroughly understand and interpret the civil, family and legal categories.

**Administrative law of Ukraine.** Educational subject, which includes the mastery of specific tools of administrative law science, the study of the essence, forms and methods of state government, the Executive power system and its functions, problems of administrative enforcement in the state administration and the responsibility, the state economic management, the management of social and cultural development, administrative-political activity and cross-sector state governance.

**Criminal procedure.** As an educational subject, criminal procedure is based on the science of criminal procedural law and practice of its application by the courts, prosecutors, investigators, bodies of inquiry, lawyers. The aim of teaching the course «Criminal criminal procedure of Ukraine» is the disclosure of its importance for the protection of rights and legitimate interests of physical and legal persons during criminal proceedings, for consolidation of legality and law order, protection of interests of society and state.

**Economic law.** Economic law is taught to students of the third course, that is why the subject includes the study of economic law legal institutions, based on already obtained knowledge of state and law theory, constitutional, administrative, financial, civil laws and other methodological recommendations are to be used to help in acquisition of subject knowledge and to achieve the aims of the course study. The purpose of course is formation of the system of knowledge about legal regulation of economic activity, legal regulation of economy business in various specific fields of national economy.

**Employment law.** Employment law is one of the leading branches that constitute the law system of Ukraine, as it regulates one of the most important spheres of social relations — labour relations between employees and employers.

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**Land law.** Land law studies the social relations between the subjects as to the realization of property right to land, and as to the issues of ownership, usage and disposal of the land. The purpose of the land law is the regulation of the land dealing relations between the subjects. According to the land law system, there are land dealing institutions, they are primarily the property right to land, forms of land uses, land servitudes, neighbourliness, security of property right to land, responsibility for violation of land legislation, the legal regimes of the land of Ukraine in accordance with their categories etc.

**Economic procedure.** Economic procedure studies the basic concepts, institutions, principles and sources of the economic procedural law, the provisions regarding organization and functioning of the economic courts of Ukraine; peculiarities of consideration of economic disputes; teaches to use the acquired knowledge in practice and make corresponding procedural documents. The aim of the course "Economic procedure" is to form a system of theoretical knowledge and practical skills of application of the procedural law norms with the rules of substantive law during the consideration of disputes subject to the jurisdiction of the economic courts.

**Civil procedure.** Discipline «Civil procedure» is based on the system and the provisions of the Civil Procedure Code of Ukraine. This discipline studies the general provisions of the legal regulation of the procedure for consideration and disposition of civil cases, institutes of civil procedural law, that constitute its system, including civil legal procedural jural relationship, evidence and proof, the development of civil procedure as to stages and procedures, the procedural issues of execution of judicial awards.

**Environmental law.** Environmental law is aimed at creating most favorable conditions for life, work and recreation of citizens. This is life saving and protecting branch of law, its importance for human life and activity and for the whole society is hard to overestimate. The highest goal of the social policy of our state is to take care of the life and health of a person - this sector has the potential to implement it. Environmental relations are established between society and nature, between people and the environment. The objects of ecological relations are the natural wealth of the land, its minerals, waters, forests, air, wildlife, etc.

**International law.** International law plays an important role in the regulation of the relations between states, helps to maintain their stability. The science of international law develops the ability to assess and reasonably predict the development of international policy and relations. Study of this science allows to predict changes in the system of international relations, to simulate the behavior of subjects of international law, and to predict the effects of their proposed solutions. Study of this system of law and educational subject offers a future lawyer the opportunity to understand the processes of implementation and regulation of international cooperation. Course has theoretical and practical and legal value.

**Administrative procedure.** The purpose of the course «Administrative procedure» is the deep study of legal forms and methods, constitutional and legislative framework and human rights protection methods. Because it is the rules of administrative procedure, which provide recognition of the rights, duties and interests of natural or legal persons in the public sphere and their protection using management, installation and judicial means. The provisions of administrative procedure law of Ukraine define the procedure, conditions and measures for consideration and solution of specific administrative cases.

**Financial law of Ukraine.** Today, social, legal and political reforms are being implemented in Ukraine. In terms of the radical changes in the life of our country, the content of the financial relations are changing significantly, their legal regulation is improving, and thus the role of the financial law significantly increases. The objective of this course is formation of knowledge about the legal regulation of financial activity of the state and basic skills of application of financial legislation.



**Agrarian law.** The study of the current agrarian legislation and legal issues arising during the formation, activity and termination of economic operator in agriculture complex, definition of the legal regime for the property of such enterprises, acquaintance with the specifics of their management; study of the relations of the reforming of property and land of non-state agricultural enterprises, ways of protection of the peasants rights in the process of reforming, the peculiarities of the legal regime of agricultural purpose lands .

**Criminalistics.** Transition of Ukraine to the new socio-economic structure and process of the development of the operative democratic state and a truly civil society, as well as the necessity of building of the effective modern law enforcement system needs active usage of rich armory of science against criminality. The science of criminal law is important discipline in the system of scientific knowledge, it is enhancing the enforcement activities. The discipline « Criminalistics» plays the special role in the long process of training of high profile, modern lawyer.

**Criminology.** While studying the subject the listener learns such knowledge as theoretical material with regard to the concept, the subject, the method of criminology as an education subject, subject, tasks of criminology as a science, legislation, which regulates the prevention of crime as whole and its separate types.

### **Optional components**

#### ***Optional Block 2 (Student's Choice)***

##### ***Optional Block 2.1***

**Basics of the economic theory.** The main task of the course "Basics of the economic theory" is formation of deep economic knowledge of students, logic of modern economic thinking and economic culture, adequate conditions of transition of the country to market relations, teaching of students the basic methods of analysis of economic processes, and the ability to take informed decisions about economic problems.

**Basics of Business Design.** The course provides to the students theoretical training on management: - the nature of the basic concepts and categories of management and administration; - principles and functions of management; - systems management methods; - content management processes and technologies; - modern management theories and evolution of specific management functions under the influence of scientific and technological progress; - key features as subject in management, its interaction with the environment, organization and team; - Theory and practice of decision-making, implementation manager main functions of planning, organization, motivation and control; - The phenomenon of leadership and its use for effective regulation of subordinates actions; - Information support of the management and investigation of influence on this process communications systems; - Ethics and responsibility in management; - Management efficiency. The purpose and objectives of discipline: learning basic knowledge of the marketing. Study: general methodological foundations of marketing theory and practice of marketing research, the mechanism of influence on the competitive position of firms in the market, set of basic elements and tools of marketing, marketing management.

**Religion studies.** The aim of the course is to study history of the formation and evolution of religious systems, the nature and genesis of dissent, contemporary religious situation in the world and in Ukraine, reveal the nature of religion as a social and cultural phenomenon, philosophical and spiritual - moral preparation of students for their self-orientation in terms of free choice, knowledge of social and cultural characteristics of different countries and people.

### ***Optional Block 2.2***

**Juridical psychology.** The main tasks of legal psychology is to study the psychological patterns of the impact of law and law enforcement on individuals, groups, collectives, and the development of scientific recommendations in order to improve the effectiveness of law enforcement, strict compliance with the law, successful solution of problems of justice and the rehabilitation of persons who have committed a crime.

**The Psychology of Management.** The study of psychological patterns of management, problems of communication and interaction between people in different social structures and analysis of psychological conditions and characteristics of management activities in order to increase the effectiveness and quality of work in the management system.

**Conflictology.** Conflictology - a system of knowledge about patterns and mechanisms of emergence and development of conflicts, as well as principles and technologies of their management. The main task is to develop students' skills and abilities to identify main content of the notion of conflicts, constructively resolve conflicts and to prevent conflicts in professional activities.

### ***Optional Block 2.3***

**History of political and legal thought in Ukraine.** Higher legal education at the present stage of development of our state now becomes qualitatively new content under the new state law requirements. Academic discipline "History of political and legal thought in Ukraine" creates the students ability to analyze, to give their own assessment of a particular concepts, doctrine, the views of local thinkers and scientists; laying the foundations of an alternative legal thinking.

**Legal thought in Ukraine.** State Process in Ukraine is largely based on the achievements of the national legal thought. Educational Discipline "Legal thought in Ukraine" will allow students to explore and analyze how motivated these or other approaches, concepts formed the constitutional institutions of Ukraine at different periods of our country.

**Legal doctrines of the XX century.** Legal thought in the twentieth century has reached one of the highest levels of development. This happened in the nascence event of a large number of different doctrines, concepts, political and legal doctrines. Discipline "Legal doctrines of the XX century" enable students based on complex analysis, synthesis and critical reflection of all available published materials research and analyze various legal doctrine and doctrine, to determine their impact on the development of human civilization.

### ***Optional Block 2.4***

**International and legal standards of human rights.** The usage of the nuclear energy for peaceful purposes opens extremely wide opportunities to improve the welfare of mankind. However, increasing of the number of scientific and industrial nuclear reactors, the intensification of nuclear materials trade and transportation, utilization of nuclear waste contain a potential risk of radioactive contamination of people and the environment. At the same time due to its physical and chemical properties, the radioactive contamination is a danger to the countries, which may be located far from the borders of the country, where the nuclear incident occurred. These circumstances require joint efforts of the international community in ensuring of the safe development of atomic energy and to prevent negative consequences of uses of the atom for peaceful purposes .

**International defence of human rights.** The course is aimed at confirmation of the right as the art of goodness and justice through the promotion of a positive attitude towards the protection and observation of human rights and fundamental freedoms. It provides an overview of the basic ideas, concepts, principles of human rights, which are reflected in the theoretical writings and practice of the European Court of Human Rights and it contains information about legal activities in the field of human rights, forms, ways of legal protection and human rights observation.

**Practice of European Court on Human Rights.** The practice of the European court shows that the number of violations of human rights in Ukraine is only a little over 1% of the total number of human rights violations, recorded by European court in other countries. For example, from 8.5 thousand decisions of European court, only 120 in European court found a violation of rights by Ukraine. Very rarely, cases against Ukraine were satisfied by the court in full, and often not in the part of the claim, which appeared as a defining. Thus, a certain practice was formed in Ukraine as to appeals to the European court of human rights and passing judgment, which requires its study and analysis for a more effective recourse to the Court.

### ***Optional Block 2.5***

**Inheritance Law.** The proposed course «Inheritance Law» is designed for law students and aims to prepare future expert in law, which could analyze scientific literature and to how the legislation through the prism of their practical application and conduct independent research. The task of the discipline is to familiarize with the basic provisions of inheritance law and its individual institutions; analysis and generalization of judicial practice in the field of inheritance law; self-help skills development of practical situations.

**Residential Law.** The purpose of discipline «Residential Law» is to develop in students a certain level of knowledge on legal and organizational issues of residential relations. The main objectives of studying the discipline «Residential Law» are students in acquiring knowledge and ability to effectively solve the problem of professional activities must meet the requirements of safety and guaranteeing the preservation of life, health and disability in professional activities of lawyers.

**Copyright law.** The purpose of discipline «Copyright law» is the formation of student's knowledge about the concepts and the grounds of protecting the rights and interests of authors. The objectives of the course are: theoretical study of the necessary provisions on copyright protection; mastering basic regulations, treaties in copyright law; study design and procedures for protecting the rights of authors.

### ***Optional Block 2.6***

**Intellectual property law.** Intellectual property issues in the modern world took a prominent place and became not just a legal or commercial, but because of the general intellectualization of modern economy, these problems, the solution of which requires complex strategic approaches, are becoming more political, that is why the role of the country in the protection of the owner rights in the conditions of deepening market reforms increases.

**Notary in Ukraine.** Notary in Ukraine is a system of bodies and officials entrusted with the duty to certify the law and facts, which have having value, and perform other notary actions, prescribed by the law, with the purpose of giving them legal validity. Study of subject "Notary in Ukraine" is the important and integral part of higher education of students who chose the profession of a lawyer, because their responsibilities will include

not only knowledge of laws and regulations, but also to application and explanation of them to others.

**Family Law.** The purpose of discipline «Family Law» is to acquire knowledge about the legal regulation of property and personal relations of family nature. The program involves teaching the discipline study of family law, practice of legal regulation in the sphere of family relations and newest theoretical developments on this issue.

### ***Optional Block 2.7***

**Law of social security.** Discipline involves the formation of student knowledge system of legal regulation of security and social relations in Ukraine, acquaintance with the basic concepts and principles of social security law, the study of current legislation on social security, legal problems arising in the course of its application, the definition of the legal status characteristics subjects of social security, study grounds and conditions of, modification and termination of security and social relations, learning methods of regulating security and social relations and protection of the rights of specific social security law.

**Town Planning Law.** Discipline aimed at developing students theoretical knowledge in the field of regulation of urban development, including building relationships with area planning, zoning, construction works and putting into operation of construction and practical skills in the approval procedures for construction permits and the basic agreements concluded in construction.

**Recreational right.** Issues to be studied: scientific approaches and provisions of the current legislation on tourism and recreational activities, proper application of the environmental, economic, and other areas of international law, implementation of measures of the legal protection of natural resources as an object of tourist-recreational use.

### ***Optional Block 2.8***

**Advocacy Ukraine.** Advocacy is the integral factor in the legal system and the main non-state Institute of protection of the individual, his / her rights and freedoms in civilized democratic countries. Almost all international human rights acts, ranging from the Common declaration and finishing with the Main provisions about the role of lawyers, consider the right to receive professional legal assistance as one of the most important rights of each person.

**Prosecutor's supervision.** Discipline "prosecutor's supervision" - an integral part of a complete legal education. Knowledge of the organization and activities of the prosecution, its capabilities in protecting the interests of individuals, society and the state, its place and role in the Ukrainian legal system needed not only to graduates of higher educational institutions, who decided to choose the location of their future prosecution. At least this knowledge need lawyers who work in the bodies of representative and executive bodies, courts, banks, commercial structures, ie wherever needed highly qualified specialists.

**Medical jurisprudence and forensic psychiatry.** The aim of the course "Forensic medicine and psychiatry" is mastering general theoretical knowledge and practical skills necessary for the proper and timely appointment of forensic psychiatric examination for the correct formulation of its goals, providing all the necessary data on the subject person competent interpretation of examination findings.

### ***Optional Block 2.9***

**European law.** Ukraine, which is located in the centre of European continent, should take its proper place and contribute to new perspectives of development of European and transatlantic relations, basing on unconditional respect for the norms of a democratic civil society, supremacy of law, development of market relations on the principles of free competition. European law is a branched complex international and supranational legal norms relating to different branches of law and are in a state of rapid development.

**Institutional law of EU.** Creation of the European Union with its special system of legal norms was due to the development of the economic, political and legal integration on the European continent. We consider the competence of the EU as a form of institutionalization of the integration processes in Europe and make the legal description of the ratio of the exclusive competence of the EU and competence of the Member States, features of the legal nature of the EU, due to its supranational character, which affects the structure and activities of the institutional mechanism of this interstate integration association; characterize the basic principles of activities of the executive authorities of the EU: European Commission, which affects the development of integration processes within the EU; the legal nature and the order of adoption by the EU Council and the European Commission of the legal acts - regulations, directives, decisions.

**National law of foreign countries.** The task of the education subject is to develop students' theoretical and practical knowledge on the theory and practice of the educational subject National law of foreign countries, to learn the legislative base and the ability to put it into practice. The theoretical part aims to familiarize with the concept and essence of this educational subject, to familiarize with the laws, legal norms of different countries, domestic constitutional law of each country, constitutional and legal status of a person and citizen, forms of government, elections and referenda, system of higher authorities. The practical part aims to familiarize with depth study of the analysis of modern system of normative and legal acts of foreign countries, ability to put them into practice, to consider a certain range of public relations regulated by the norms of law of different countries.

### ***Optional Block 2.10***

**Banking law.** Banking law of Ukraine is the independent branch of law, which includes the system of norms and principles aimed at regulation of the banking activity, organisation and functioning of the banking system of Ukraine. The course of banking law, which was designed to help students to master the banking law as a separate branch, promotes the independent acquisition of skills and the professional solving of practical problems in this sphere. The significance of the course is based on the increasing importance of the banking law in the system of legal sciences, mainly because of the transition of Ukraine to the principles of a market economy, the growth of the role of banks as financial intermediaries in the national financial and credit system.

**Tax law.** The objective of the course is to: understand the concept and characteristics of the tax law, tax legal relations, tax system of Ukraine; study the nature and direction of tax system reforming and tax legislation, to analyze the regulations that regulate the payment of taxes; consider the structure, functions and powers of tax control, liability for violation of tax legislation as well as ways to protect the rights and legal interests of taxpayers.

**Customs Law.** The purpose of the discipline "Customs Law" is the mastering of complex knowledge and skills regarding the essence of Customs Service of Ukraine; the legal basis for activities of the Customs Service of Ukraine.

**Optional Block 2.11**

**Corporate Law.** Corporate law is a new institutional formation in the law system of Ukraine. The terms “corporate law”, “corporate relations” were practically not used for a long time in the domestic legal science, they occurred only in works, devoted to the study of foreign countries law. The purpose of subject “Corporate law” is to give students basic knowledge of the subject, provide training aimed at the formation of intellectual potential of highly qualified lawyers, which have basic theoretical knowledge in the field of corporate right, necessary for future activities

**Housing law.** The purpose of discipline «Housing law» is to develop in students a certain level of knowledge on legal and organizational issues of residential relations. The main objectives of studying the discipline «Housing law» are students in acquiring knowledge and ability to effectively solve the problem of professional activities must meet the requirements of safety and guaranteeing the preservation of life, health and disability in professional activities of lawyers.

**Exchange Law.** The purpose and objectives of discipline «Exchange Law» are: forming a system of knowledge on the legal regulation of exchange relationships in Ukraine, ordering of trends and ways to solve problems and put forward the accumulated exchange practice solving disputes.

**Optional Block 2.12**

**International law of energy security .** The purpose and objective of the course is to develop students' knowledge on appropriate international legal regulation of energy law, and therefore relations that arise in this area, namely the development of energy resources and active transit trade, development of interstate relations in energy sphere, etc.

**International law of nuclear safety.** The purpose and objective of the course is to develop students' knowledge on appropriate international legal regulation of nuclear safety and the principles of international nuclear law, namely nuclear safety; non-proliferation; control the proliferation of nuclear weapons; monitoring the peaceful nuclear activities; mutual assistance in case of a nuclear accident or radiological hazards.

**International maritime law.** The main objective of the discipline is to study: the concept, system and sources of international maritime law, the rights and jurisdiction of the coastal state, the institution of the continental shelf, the maritime area of international law and special legal regime, private international law of the sea, the legal status of the ship, international legal regulation of shipping, settlement of international maritime disputes, contemporary international legal problems of safety at sea.

## 2.13. ECONOMIC FACULTY

Dean – Professor, Doctor of Economics **Anatolii D. Dibrova**

Tel.: (044) 527-85-40 E-mail: [dibrova@nubip.edu.ua](mailto:dibrova@nubip.edu.ua)

Location: Building № 10, Room 301

The faculty organizes and coordinates Bachelor training in the following specialties:

### ***051 Economy***

Educational and professional program «**Economics enterprises**»

Graduating departments:

Enterprise economics named after prof. I.V.Romanenko, Tel.: (044) 527-81-01

E-mail: [dibrova@nubip.edu.ua](mailto:dibrova@nubip.edu.ua)

Head of Department – Professor, Doctor of Economics Svitlana M. Rogach

Entrepreneurship and agribusiness organization, Tel.: (044) 527-86-60

E-mail: [dibrova@nubip.edu.ua](mailto:dibrova@nubip.edu.ua)

Head of Department – Professor, Doctor of Economics Mykola M. Ilchuk

Labour Economics and Social Development, Tel.:(044) 527-82-69

E-mail: [dibrova@nubip.edu.ua](mailto:dibrova@nubip.edu.ua)

Head of Department – Professor, Doctor of Economics Oleksandr Yu. Yermakov

Global Economy, Tel.:(044) 527-86-48 E-mail: [dibrova@nubip.edu.ua](mailto:dibrova@nubip.edu.ua)

Head of Department – Professor, Doctor of Economics Natalia M. Vdovenko

### ***071 Accounting and Taxation***

Educational programs "**Accounting and Audit**"

Graduating departments:

Accounting and Taxation, Tel.:(044) \_527-83-61

E-mail: [book-keep\\_chair@nubip.edu.ua](mailto:book-keep_chair@nubip.edu.ua)

Head of Department – Professor, Doctor of Economics, Ievheniia V. Kaliuga

Statistics and economic analysis, Tel.:(044) 527-82-36

E-mail: [statistics\\_chair@nubip.edu.ua](mailto:statistics_chair@nubip.edu.ua)

Head of Department – Professor, Doctor of Economics Inna D. Lazaryshyna

**072 Finance, Banking and Insurance**

Educational and professional program «**Finance, Banking and Insurance**»

Graduating departments:

Finance Tel.:(044) 527 88 90 E-mail: kafedfin@ukr.net

Head of Department – Professor, Doctor of Economics Nadiia M. Davidenko

Banking and insurance Tel.:(044) 527 88 90 E-mail: banking\_chair@nubip.edu.ua

Head of Department – Professor, Doctor of Economics Lybov M. Khudoliy

**076 Entrepreneurship, Trade and Exchange Activities**

Educational program " **Entrepreneurship, Trade and Exchange Activities** "

Graduating departments:

Entrepreneurship and agribusiness organization, Tel.: (044) 527-86-60

E-mail: organizing\_chair@nubip.edu.ua

Head of Department – Professor, Doctor of Economics Mykola M. Ilchuk

Exchange activity and trade, Tel.: (044) 527-81-31

E-mail: exchange@nubip.edu.ua

Head of Department – Professor, Doctor of Economics Nadiia P. Reznik



**Bachelor's degree**  
**field of knowledge "Social and Behavioral Sciences"**  
**in specialty "ECONOMY"**  
**Educational and professional program «Economics enterprises»**

Learning:	Licensed amount of persons:
- day	100
- extra	80
Training period	3 years 10 months
ECTS credits	240
Language teaching	Ukrainian, English
Qualification of graduates	Bachelor of Economics

**The concept of training**

Specialty "Economics" are trained professionals who can provide a high-level scientific, economic and organizational activities of the company. To be able to develop measures to improve productivity, efficiency and profitability, product quality, reduce costs, ensure productivity growth, achieving effective results in terms of rational cost of material, labor and financial resources and organize their implementation. To be able to draw up business plans, term plans of the company in a market economy and competition with necessary justifications and calculations, organizational and technical measures to improve the economic mechanism, management structure, economic activity, identification and use of production reserves. To ensure sustainable development of the primary forms of planning, accounting and reporting documentation, which is used in the enterprise, and also participates in the implementation of automated control systems and computer technology for economic calculation in planning, accounting and business analysis.

**Practical training**

Practical training is an integral part of the educational process of training specialists of different educational levels in economics. Entry professional practical skills of highly qualified specialists is possible only if direct participation in industrial manufacturing processes at the agricultural enterprises of different ownership units and research institutions.

**Proposed Topics for Bachelor theses**

1. Efficiency of inputs farms
2. Analysis of the effectiveness of innovative development company
3. The intensification of grain production and ways to improve its economic efficiency
4. The economic efficiency of sunflowers and ways to improve
5. Organizational-economic substantiation of crop production program

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Chief Economist; Chief economist of planning and finance department; chief economist department of labor and wages, chief economist department of labor and wages, Head of Laboratory scientific management and production management, Economist, Economist, Planning, economist contractual claims work, an economist at financial work, managers and assistant economic departments companies, associations, firms serving areas APK different ownership and so on.

**Bachelor`s Program and Curriculum  
in specialty "Economy"  
Educational and professional program «Economics enterprises»**

Code e / d	Components of the educational and professional program	ECTS credits	Form the final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components of ERP</b>			
CC 1.1.1	Political Economy	5	exam
CC 1.1.2	Microeconomics	4	exam
CC 1.1.3	Macroeconomics	4	exam
CC 1.1.4	Economic history	4	exam
CC 1.1.5	Mathematics for Economists	7	exam
CC 1.1.6	Probability and mathematical statistics	5	exam
CC 1.1.7	Computer Science	4	exam
CC 1.1.8	Econometrics	4	exam
CC 1.1.9	Optimization methods and models	4	exam
CC 1.1.10	Statistics	5	exam
CC 1.1.11	Finance	4	exam
CC 1.1.12	Accounting	5	exam
CC 1.1.13	Money and Credit	4	exam
CC 1.1.14	Management	4	exam
CC 1.1.15	Marketing	4	exam
CC 1.1.16	International Economics	4	exam
CC 1.1.17	University education and social communication	2	credit
<b>Total</b>		<b>73</b>	
<b>Optional components of ERP</b>			
<b>Optional components of ERP 1 (University of Choice)</b>			
OB 1.2.1	History of Ukrainian Statehood	4	exam
OB 1.2.2	Philosophy	5	exam
OB 1.2.3	Foreign Language	8	exam
OB 1.2.4	Physical Training	4	credit
OB 1.2.5	Labour and Life Safety	4	exam
OB 1.2.6	The technology of crop production	5	exam
OB 1.2.7	Technology of production of livestock products	5	exam
OB 1.2.8	Science of law	3	exam
Total		<b>35</b>	
Volume of components of the general training cycle		<b>108</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components of EPP</b>			
CC 2.1.1	Potential and development of the enterprise	5	exam
CC 2.1.2	Business Strategy	5	exam
CC 2.1.3	Planning and control of the enterprise	5	exam
CC 2.1.4	Organization of production	5	exam
CC 2.1.5	Project Analysis	5	exam
CC 2.1.6	Justification economic decisions and assessing risks	4	exam
CC 2.1.7	Economics of Enterprise	10	exam
CC 2.1.8	Labor Economics and Labor Relations	5	exam
CC 2.1.9	Cost management	5	exam
<b>Total</b>		<b>49</b>	
<b>Optional components of ERP</b>			
<i>Optional components of ERP 2 (by choice of students)</i>			
OB 2.2.1	Foreign Language	4	exam
	Logic		
	Sociology		
	Psychology and Pedagogics		
	Religious Science		
	Cultural and Educational Activities		

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

	Basics of Rhetoric		
OB 2.2.2	The economy of agricultural enterprises	4	exam
	Environmental Economics.		
OB 2.2.3	The economy of rural communities	4	exam
	Basic scientific research in economics		
OB 2.2.4	Agribusiness Organization	4	exam
	Starting of own business		
OB 2.2.5	Accounting in applied software solutions	4	exam
	Information Systems and Technologies		
	Databases and Database		
OB 2.2.6	The tax system	4	exam
	Taxation of individuals and legal entities		
OB 2.2.7	Insurance	4	exam
	Insurance services		
OB 2.2.8	Fundamentals of stock	4	exam
	Exchange Stock Market		
OB 2.2.9	Price and pricing	4	exam
	Trading strategies of enterprises		
OB2.2.10	Finance companies	4	exam
	Investment		
OB2.2.11	Audit	4	exam
	Enterprises Reporting		
OB2.2.12	Economics and organization of innovation activity	4	exam
	Fundamentals of Agricultural Consulting		
	Economy of world agriculture		
	Agrarian Management		
OB2.2.13	Rationing and payment of labor	4	exam
	Sociology of Labor		
OB2.2.14	Economic analysis	4	exam
	Financial Analysis		
OB2.2.15	Regional economy	4	exam
	National Economy		
<b>The volume of components of the cycle of special (professional) training</b>		<b>109</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
	Military training	23	
	Educational practice	6	
	Internship	9	
	Preparation of bachelor work (thesis or project)	4	
	State attestation	4	
<b>At the direction of (without military training)</b>		<b>240</b>	

## Annotations of components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Political Economy.** The purpose of discipline is learning future specialists fundamental economic knowledge, forming their logic of economic thinking and economic culture, teaching them the basic knowledge and methods of analysis of economic processes, the ability to make informed decisions about economic problems related to their future practitioners.

Objective: acquisition of appropriate skills of rational economic behavior, based on the conceptual foundations of a market economy, the modern understanding of the functioning of markets and pricing for the services of labor, capital, natural resources according to the type of market structure; skills analysis aggregates, determining factors and the effects of macroeconomic development of business systems and capacity of the state to correct this development in accordance with the objectives and priorities of economic policy.

**Microeconomics.** The aim of the teaching of the discipline is to develop market-oriented economic outlook, knowledge and skills regarding clarification of the mechanisms establishing and rebalancing microsystems and efficiency of economic entities. To achieve this goal the following tasks: learning motives, basic laws and methodological principles of behavior of economic agents in the market conditions at the micro level; universal mastering tools for self-analysis and study of optimal economic decisions in conditions of limited funds and the availability of alternatives.

**Macroeconomics.** The purpose of discipline is to provide students deep theoretical knowledge on the economy - important sphere of human activity, the objective economic laws, familiarity with the methods and conditions of effective management and systematic holistic picture of macroeconomic theory and policy. Logic and structure of the course "Macroeconomics" will allow students to learn the necessary amount of knowledge that makes it possible to achieve a high level of professional competence and economic future professionals. Task. The main objectives of the course is to study issues such as methods for measuring the dynamics of domestic production; forming conditions and consequences of violation of macroeconomic equilibrium; the impact of inflation on unemployment and economic development; methods of state fiscal control; State instruments of monetary policy.

Economic history involves the formation of knowledge about the main stages of formation and direction of economic development and economic research, the conditions and regularities of the evolution of the world economy, economic concepts and directions of the main schools of economic thought.

Subjects of discipline: economics of world historical development, emergence and development of economic ideas and ideas that prevail in the system.

Content modules: economics and economic thought of primitive societies of the period of the day and beginning of the nineteenth century. World economy and main directions of economic thought of the XIX - XX centuries.

**Mathematics for Economists.** The purpose of higher mathematics is the formation of individual students develop their intelligence and ability to logical and algorithmic thinking. The main tasks of the course is to master the basics of mathematical tools necessary for solving theoretical and practical economic problems; ability to independently discover, learn and apply the scientific literature and other information sources and resources on higher mathematics; working out mathematical skills in research

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applications, such as the ability to transfer specific economic problems in mathematical language with the following construction of a mathematical model.

**Probability and mathematical statistics.** The object of study is the patterns of random events and their use for constructing economic stochastic models. The purpose of discipline is the development of basic knowledge and practical skills of the basis of the probabilistic-statistical system, the basic methods of quantitative measurement of randomness of factors affecting any process, the principles of mathematical statistics used in planning, organization and production. management, product quality assessment, systematic analysis of economic structures and processes, application of mathematical methods in the economy. The program involves studying two structural modules - probability theory and mathematical statistics.

Computer Science object develops knowledge of the principles of construction and operation of computers, organization of computing processes on personal computers and their algorithmization, PC software and computer networks, and effective use of modern information and communication technologies in professional activity. The main objectives of the course is to study the theoretical foundations of computer science and applied skills using economic data processing systems; of programming for the PC; Computer networks in the study of social and economic systems and solving problems of professional orientation. Provides meaningful study four modules: the architecture of the modern computer, advanced software processing of textual information, work with a spreadsheet software MS Excel and modern software processing graphic data.

**Econometrics.** The purpose of discipline "Econometrics" is of students' knowledge about the quantitative evaluation of economic performance relationships for different sets of economic information, the latter resorting to testing on compliance of certain preconditions. The objectives of the discipline that must be solved in the course of the study are: help students master the methods of construction and implementation of econometric models using a personal computer; gain knowledge about the use of econometric models in economic research; acquiring skills students summarizing the results of statistical analysis and development of appropriate management decisions.

Optimization methods and models of educational discipline aimed at mastering the methods for solving optimization problems of financial and farm management.

The object of study - economic, organizational and management systems. Knowledge of the "Optimization models and methods" required students to write a bachelor's and master's theses and research.

**Statistics.** The purpose of discipline "Statistics" is to develop basic knowledge of students, including mastering their professional knowledge and practical skills in methods and forms, types and methods of statistical monitoring of agricultural production, development and analysis of statistical data, promotion of economic thought adapted to the requirements of the market economy.

The task of discipline that must be solved in the course of the study: understanding the challenges set before the statistical service of Ukraine in the current market conditions; mastering theoretical positions and mastering practical skills to use statistical methods of analyzing mass social and economic phenomena and processes; skills summarizing the results of statistical analysis and development of appropriate management decisions.

**Finance.** The purpose of discipline "Finance" is to develop basic knowledge of finance theory, learning patterns of their operation at the macro and micro levels as the theoretical basis of financial policy and financial system. The educational goal of the discipline involves the acquisition of knowledge in all areas of operation of the financial mechanism, namely form students of finance conceptual apparatus for use in practice; provide information on finances, the financial system of the state and its role in the functioning of the economy; learn to apply their knowledge in practice, make informed decisions and to solve the problem.

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**Accounting.** The goal of teaching "Accounting" is to develop the system of knowledge of the theory and practice of accounting in the company. The main objectives of the discipline "Accounting" is the study of methods and rational organization and accounting in enterprises based on the use of progressive forms and national standards; study skills and use of accounting information in management.

**Money and Credit.** The purpose of the course is to give students theoretical and practical knowledge for the management of the organization cash flow, to form the students a theoretical basis for the subsequent mastering the practice of using monetary tools in the system of economic regulation Ukraine. It is important is to study economic relations with a turnover of money, including as a means of circulation of credit relations in modern economy.

**Management.** The purpose of discipline is to give students a comprehensive system of knowledge about nature management in enterprises and organizations and agribusiness management skills of production processes in them; conditions for performance of business structures; diagnosis and designing system of agricultural management, appropriate goals and objectives of market economy in agriculture. The objective of the discipline is to train future professionals able to streamline the organizational structure and management system to create enterprise (organization), maintain stability and capacity, ensure the dynamic development and competitiveness, which precedes theoretical preparation of students for the administration and management of the agricultural sector.

**Marketing.** The purpose of discipline "Marketing" is learning and mastering theoretical knowledge and practical skills on the application, the use of tools AMP; organization, planning, implementation, management agromarket activities of agricultural enterprises for the effective functioning of the markets for agricultural products and foodstuffs in Ukraine and abroad, and further development. The task of discipline "Marketing" is to get the students knowledge in the field of agricultural marketing; marketing research markets for agricultural products and foodstuffs; forecasting market conditions; inventory management products agricultural enterprises and their quality; pricing; distribution system and marketing of agricultural and food products; promotion of food products in domestic and foreign markets; and gain knowledge in planning agricultural marketing, management and control of agromarket.

**International Economics.** The purpose of teaching "International Economy" is to develop a system of theoretical and applied knowledge of modern role, functional content and tools of international economics in a highly competitive environment, the laws of the modern global economy. The main objectives of the discipline is to develop in students a holistic idea about the specifics of international business; mastering categorical apparatus used in the commission of international trade; forming a system of knowledge about the theoretical foundations international environment analysis and evaluation of its attractiveness for foreign business.

**University education and social communication.** The purpose of teaching this discipline is to summarize: the vision of students of higher education as a subsystem of the educational area and socio-cultural environment, mastery of knowledge, abilities and skills necessary to understand its potential systemoformuyuchoho; knowledge of basic principles, principles, practices and perspectives of the Bologna process. The objectives of the study subjects are: knowledge and understanding of the students of the place and role of higher education in the structure of the educational system, the mastery of experience analyzing the theoretical foundations of the functioning of modern Higher Education; major trends, factors and forms; creating an understanding of integration processes in education, basic principles, results and prospects of the Bologna process.

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## Selective components

### *Sample Block 1 (University of Choice)*

Annotations of disciplines “History of Ukrainian Statehood”, “Philosophy”, , “Foreign Language (English, German, French, Spanish)”, “Physical Training”, “Labour and Life Safety”, see Section 2.1.

**The technology of crop production.** Scientific bases of crop production. Modern agricultural technologies. Technological maps of growing crops. The concept of the programmable growing crops. The concept of the technology of storage, processing of various types of crop production.

**Technology of production of livestock products.** The current state of the livestock industry. Forage. The impact of standardized feeding, breeding, means the animals on their level of performance. Milk, meat, eggs, wool etc.

**Science of law.** Purpose: to provide basic training of students in the field of formation of students basic knowledge of the theory of law, mastering the system of basic concepts of jurisprudence, mastering the most important provisions of certain legal branches and developing skills in their application in practice.

## 2. SPECIAL PREPARATION CYCLE

### Compulsory components

**Potential and development of the enterprise.** The purpose: of mastering the conceptual apparatus of discipline, methodology and assessment tools applied market value potential of the company and its structural elements; acquisition of knowledge of the laws, principles and features of the formation, growth, competitiveness-building potential of the company as a balanced integrated education.

Objective: Learn the latest means of effective capacity building enterprise, ensuring its competitiveness; knowledge and practical skills assessment activities as part of management development potential of the company.

**Business Strategy.** The main task of classes is mastering the theoretical principles of strategic planning, develop of skills and tools of strategic analysis and a strategy of the company.

Objective: development tools, enterprise development strategies and selection of strategic alternatives; strategic thinking skills development and practical application of methodological apparatus discipline; mastering by case analysis, feasibility study skills to solve strategic problems.

**Planning and control of the enterprise.** The purpose of discipline is to develop the students' knowledge of system development methodologies prospective and current plans of the company and monitoring their implementation

Tasks of the course: mastering forms, methods and process planning and control; study of the structure and technology development of model plans for economic and social development enterprise of indicators and methods of their calculation, optimization of production program

**Organization of production.** The purpose of studing is formation of theoretical knowledge and skills of rational organization of production and use of methods to increase the efficiency of the company. Objective: To study the theoretical principles of rational organization of agricultural production units; practical skills on rational organization of production and use of methods to increase the efficiency of the company.



**Project Analysis.** The purpose of discipline is to form a system of knowledge assessment methodology to design solutions; development and study projects to meet social and personal needs with limited resources. The main tasks of project analysis are: learning the basic concepts, concepts, methods and approaches used in the world in the analysis of design decisions; skills using tools of project analysis, mastering procedures of analysis, comparison and justification of the selection of projects, project evaluation on marketing technology, environmental, social and institutional viability, financial and economic attractiveness.

**Justification economic decisions and assessing risks.** The purpose of teaching this discipline is to develop knowledge and skills regarding substantiation of economic decisions with varying degrees of uncertainty and risk. To achieve this goal the following tasks: learning the basic principles of different types of substantiation of economic decisions, methodical approach to risk analysis and management; self-mastery skills of analysis, identification and risk assessment using computer technology and software and mathematical systems.

**Economics of Enterprise.** The economic mechanism of functioning of the company, its development and use of resource potential in order to optimize economic performance.

**Labor Economics and Labor Relations.** Academic discipline involves the study of issues related to the work as a leading factor of production, the development of labor potential of society, the formation and functioning of the system of industrial relations, labor market regulation. The main sections of the course is the organization, rationing and wages, particularly in agriculture. The problems of employment and social protection, international experience of regulation of social and labor relations and more.

**Cost management.** The purpose of the discipline is to acquire knowledge and skills on the laws of formation expenses by type, responsibility centers and carriers to minimize their level and justification of optimal economic decisions. Tasks of the course is to expand the classification and cost structure, their characteristics; the essence of domestic and foreign systems and methods of cost accounting for production and content assessment of their impact on the cost management; method of management of certain types of expenses as productive and unproductive nature; method of calculation of the planned cost of goods, works and services costing indirect costs; new approaches to the management of operations, including modern technologies in production and operations management.

### **Selective components**

#### ***Sample block 2 (by choice of students)***

##### ***Sample block 2.2. 1***

**Foreign Language.** Language education includes learning, reading, and teaching of a second language or foreign language other than native language.

**Logic Objective:** To provide students basic training in the fields of system knowledge of basic laws and forms of logical thinking, forming conscious attitude to the process of right thinking through scientific concepts and terms to familiarize students with the theory of logical thinking. The task of discipline is shaping students' skills of correct logical thinking for making good decisions in the future professional work, to participate in discussions and business communication, information processing, for logical and correct substantiation arguments and beliefs opponents; familiarizing students and methodological assistance in mastering a certain amount of knowledge about the means of intellectual

activity, its shape and laws, understanding and assimilation of features forms and laws of thought; providing logical and methodological level studies while training.

**Sociology.** Essence of Sociology. Formation of human behavior in the workplace and place of activity in the process of motivation system and means of social control. The role of labor and small groups in achieving production purposes.

**Psychology and Pedagogics.** Formation of knowledge about the psyche of the individual as the highest value of society; awareness of the nature of the mechanisms of mental processes, states, personality traits as the foundation of its formation in the process of education and training. The acquisition of key terms and concepts of psychology and pedagogy at their reproduction and interpretation; gaining basic skills to apply them in practice to improve competitiveness in professional social and psychological sphere.

**Religious Science.** This is a complex area of human cognition that studies patterns of emergence, history and general characteristics of religious beliefs. It explores social and historical nature of religion, its mechanism of social ties with the spiritual, political and economic systems of society

**Cultural and Educational Activities.** Culture and spiritual development of the individual and society. Features of enrichment of the spiritual world and cultural development of the nation.

**Basics of Rhetoric.** Subject of rhetoric, the essence of the concepts and all sections of classical rhetoric. Modern science: neorhetoric, style, poetics, pragmatics, theory of communication etc.

### ***Sample block 2.2.2***

**The economy of agricultural enterprises.** The field of agricultural economics includes agricultural finance, policy, marketing, farm and agribusiness.

**Environmental Economics.** Ecology and modern agriculture. Ecological agriculture and crop production. Environmental issues of the livestock concentration. Environmental expertise, assessment, monitoring and forecasting with the use of mathematical modeling. Environmental law, legislative support. Interaction between environmental and economic factors, maintaining proper environmental quality, resource conservation. Indicators of ecological, economic and social efficiency of environmental measures, changes of psychological conditions and socio-hygienic condition.

### ***Sample block 2.2.3***

The economy of rural communities aim of the course is to deepen knowledge about the structure and of the functioning of the rural sector in Ukraine, instill skills analysis of the current state and identify disparities in the development of its components and the development of measures to overcome them; help students get acquainted with legal regulations and research on the status and prospects of socio-economic development of settlements, rural employment, establishment of new forms of economic activity in rural areas and others. The objectives of the course are: to form a future expert, able to assess the economic, social, demographic and ecological situation in every region, district, village in the formation of a social market economy, learn to identify priorities and substantiate effective instruments and mechanisms for solving problems overcoming depression village areas to diversify their economic base and creating a socially attractive and environmentally safe living conditions for the rural population; skills to analyze cause and effect of the rural sector and the impact of internal and external factors;

**Basic scientific research in economics.** The purpose of this discipline is to highlight theoretical foundations, methodology, technology and organization of research activities in the economy, that is, the theoretical and practical grounds for the effective conducting of scientific research by students of economic specialties. The objectives of the course are to: Form students theoretical knowledge and practical skills in methodology, methodology, technology and organization of research activities in the economy with the wide use of teaching methodological and additional scientific literature.

#### ***Sample block 2.2.4***

**Agribusiness Organization.** Entrepreneurship and business in agriculture: the nature, objectives, benefits. Characteristics of businesses. Drawing up of business plans.

**Starting of own business.** This specialization is a guide to creating your own business. We will cover a progression of topics necessary for successful business creation including: mindset, ideation, planning, action and strategy. Rather than just describing what to do, the focus will be on guiding you through the process of actually doing it. The course will bring all of the tools and lessons discussed together for you to launch your business.

#### ***Sample block 2.2.5***

**Accounting in applied software solutions.** Acquaintance with the possibilities of computer technologies in the management of the enterprise, getting them a clear understanding of methods and methods of accounting with the help of computer technology - to master and master the methods and techniques of organization and practical use of automated information systems in accounting.

**Information Systems and Technologies.** The basics of accounting, composition of accounting tasks, features of their solving using various technologies of economic information processing; acquiring skills to perform typical accounting problems; develop algorithms to solve them using database management systems and application programs.

**Databases and Database Course objective** - to obtain knowledge of the theoretical foundations of databases, database management, learning basic principles and methods of database (DB) and database management systems (DBMS). Objectives of the course: to master the basic concepts of information database requirements put forward to them the principles of their construction and composition; database development "Access"; practical skills in using databases "Access" to solve economic problems.

#### ***Sample block 2.2.6***

**The tax system Objective:** To ascertain the economic nature of taxes, their nature, functions, objectivity in market conditions; disclosure of the contents of tax policy, tax system, tax mechanisms and their components, learning practical mechanism for the application of certain taxes and duties, development of requirements to fill tax returns and tax calculation mechanism. Objective: To study the theoretical and organizational bases of tax calculation methodology and manner of payment of taxes and obligatory payments of businesses and individuals.

**Taxation of individuals and legal entities.** studying the concept, system, principles, mechanism and role of taxation of individuals and legal entities; types of taxes paid by individuals; types of taxation of legal entities; tax conditions.

**Sample block 2.2.7**

**Insurance Purpose:** formation of 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. Objective: sustainable knowledge acquisition by the students of the theory and practice of management of the insurance company; insurance services; risk assessment; settlement of insurance claims.

**Insurance services principles and role of insurance services.** Classification of insurance, insurance risks and their evaluation. Insurance market and its characteristics, insurance companies, government regulation of insurance. Personal insurance. Property insurance companies and individuals.

**Sample block 2.2.8**

Fundamentals of stock Discipline "Fundamentals of stock activity" is studying the mechanism of implementation and technology exchange activities of commodity exchanges in the country and in emerging economies. The purpose of the study course - the formation of future specialist theoretical foundations and practical skills of the exchange activity and effective use of exchange operations in its future activities. Course description: Formation at students knowledge on the organization of exchange activities; acquisition of practical skills: organization of trade on the exchange of goods, securities, currencies; of relationships with brokers; exchange information for use of high-efficiency production and marketing of agricultural products.

**Exchange Stock Market.** Fundamentals of exchange activity. Commodity, stock and currency exchange. Stock exchange transaction, the procedure of agreements conducting and exchange trading mechanism.

**Sample block 2.2.9**

**Price and pricing.** Theories of pricing, the method of pricing. Limit value of the price, methodological atypical formation of prices in the conditions of inflation, ensuring the equivalence of accounting and prices in the agro-industrial complex.

**Trading strategies of enterprises.** The purpose of this course is to equip you with the knowledge required to comprehend the trading strategies of company and understand the various transactions that take place in the market so that you can create the new strategies.

**Sample block 2.2.10**

**Finance companies.** The purpose of teaching the course "Business Finance": the provision and deepen students' knowledge of the theory and practice of financial relations business entities. Tasks of the course: clarify the nature of the financial resources of enterprises, methods and sources of their formation of financial activity; gaining skills settlements of receipts, income, its distribution, the impact of taxation on the use of profits; determine the need for working capital, sources of financing reproduction of fixed assets and their efficient use; mastering methods of assessing the financial condition of sanitation companies.

**Investment.** Methodological bases of investment. Forms, objects and areas of investment. Investment risks. Financial support of investment. Budgeting of project management and investment process.

**Sample block 2.2.11**

**Audit.** The application of elements of the organization registers of synthetic and analytical accounting. Accounting for funds, payments, inventory, fixed assets, intangible assets, remuneration systems, variants of production costs, the definition of production costs. Functions of the audit: validation of the balance sheet and recording of profit and loss, analysis of accounting, its compliance with the law; respect for the equality of shareholders rights during the distribution of dividends and voting.

**Enterprises Reporting.** General reporting requirements. Balance sheet. Income statement. Statement of cash flows. Statement of changes in equity. Errors correction and changes in the financial statements. Overall and consolidated reporting. Financial report of a small business. Tax reporting. Statistical and special reports.

**Sample block 2.2.12**

**Economics and organization of innovation activity.** Acquisition of knowledge about innovation orientation of strategy and tactics of production development, innovation policy of the enterprise, principles and factors of its development, forms of innovations, methods and tools of their creation and methods of realization.

Fundamentals of Agricultural Consulting Material discipline "Fundamentals of Agricultural Consulting" aims to explore methods development, dissemination and innovation. The main objective of the course "Fundamentals of Agricultural Consulting" - form a system of student knowledge and skills in agricultural extension, agricultural experts emphasize the role profile as consultants. In the study course served characterization systems and models of advisory services in the world and Ukraine, their characteristics and place in the agrarian economy of the state, considered the objectives, methods advisory activity, its psychological and ethical aspects, especially the use of modern information technology and organization consulting international experience

**Economy of world agriculture.** The system of industrial relations in conjunction with the productive forces in agriculture. Ways and means of rational use of land, material and labor, intensification of agricultural production based on science and technology, specialization, cooperation and integration of agricultural enterprises, the development of commodity-money relations, ways to improve production efficiency.

**Agrarian Management.** The purpose of the discipline is to provide an integrated system of knowledge about the essence of management in the enterprises and organizations of the agro-industrial complex and skills in managing the production processes in them; conditions for ensuring the effectiveness of business structures; diagnosing and designing a system of agrarian management that is adequate to the goals and objectives of a market economy in agriculture.

**Sample block 2.2.13**

**Rationing and payment of labor.** Within the discipline the theoretical, methodological and applied questions related to the standardization and organization of remuneration in the process of activity of modern enterprises are taught. The main objective of the discipline is to formulate in future specialists an understanding of the conceptual foundations of labor standardization in modern conditions, the use of modern forms and systems of remuneration in the activities of enterprises. The subject of study is the general laws and peculiarities of standardization and remuneration of personnel of organizations. General patterns and peculiarities of organization and payment of personnel. Establishment of conditions (norms) of wages, establishment of labor duties of the employee, definition of the accounting system for payment of individual and collective

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results of labor; the procedure for making changes in the organization of remuneration. The main purpose of teaching discipline is to form a complex of theoretical knowledge and skills in the development and implementation of a rational organization of work of staff, rationing and remuneration, which would ensure the high efficiency of personnel.

**Sociology of Labor.** The essence, content, nature and function of labor. Formation of human behavior in the workplace activity. The role of labor and small groups in achieving production goals. Optimization of socio-psychological climate in the team.

#### ***Sample block 2.2.14***

**Economic analysis.** The purpose of discipline study course "Economic Analysis" is to develop knowledge about methods of systematic evaluation of agricultural enterprises, identify internal reserves rational use of material, labor and financial resources. The logic and structure of the course "Economic Analysis" will allow students to learn the necessary amount of knowledge that makes it possible to achieve a high level of professional competence and economic future professionals. Task. On the methodological principles of civilizational paradigm of society form the modern economic thinking and outlook of students to ensure their mastery of knowledge and methods of analysis of economic laws and processes.

**Financial Analysis.** The purpose of discipline "Financial Analysis" is to develop in students the modern economic thinking and system expertise in the theory and methodology of financial analysis, a clear idea of the content of financial and economic activity in a market economy, the causal relationship between economic phenomena and financial processes, structure information supply management; skills of management decisions to address the financial situation; mastery of skills and financial analysis. The objectives of the discipline that must be solved in the course of the study are: formation of students of modern economic thinking and system expertise in the theory and methodology of financial analysis, a clear understanding of the content of financial and economic activity in a market economy, the causal correlation bandages economic phenomena and processes financial structure with information of management; skills of management decisions to address the financial situation; mastery of skills and financial analysis.

#### ***Sample block 2.2.15***

**Regional economy.** The objective of the discipline is learning the theory of productive forces and regional economy and regional development of scientific bases of regional economic policy; mastery of knowledge about territorial and sectoral structure of economic complex of Ukraine and its economic regions and so on. The aim of the course is to develop knowledge on the theoretical and practical bases of the territorial organization of the productive forces of Ukraine, the current state and trends of regional economic development.

**National Economy.** The theoretical and organizational framework for regulating the national economy. Forecasting, macroeconomic planning and programming in the regulation of the national economy. Methods of state regulation of the economy.

Bachelor's degree  
**field of knowledge "Management and Administration"**  
**in specialty "FINANCE, BANKING AND INSURANCE"**  
**Educational and professional program «Finance, banking and insurance»**

Learning:	Licensed amount of persons:
- day	130
- extra	90
Training period	3 years 10 months
ECTS credits	240
Language teaching	Ukrainian, English
Qualification of graduates	Bachelor of Finance, Banking and Insurance

### **The concept of training**

"Finance, Banking and Insurance" are trained professionals who are at a high level can provide maintenance and financial accounting at the company. Ensure the preparation of financial statements. Take measures to determine the financial condition of the company and increase its effectiveness. Monitor the conduct cash transactions, rational and efficient use of material, labor and financial resources. To be able to apply the theoretical and practical knowledge for effective management of the enterprise financial accounting. To be able to develop proposals to improve financial. Accounting and Economics at the company.

### **Practical training**

Practical training is an integral part of the educational process of training specialists of different educational levels in economics. Entry professional practical skills of highly qualified specialists is possible only if direct participation in industrial manufacturing processes at the agricultural enterprises of different ownership units and research institutions.

### **Proposed Topics for Bachelor theses**

1. Financial support for farms
2. Mechanism of regulation of the financial market in Ukraine
3. The development of credit market in Ukraine
4. Systema taxation of businesses and ways to reform
5. The development of the life insurance market in Ukraine

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Financier; Economist Planning and Finance Department; Head of the Laboratory of Scientific and Production Management, Economist, Economist, Planning, economist at the contract work claims, an economist at financial work, assistant managers and financial departments of companies, associations, firms serving areas APK different ownership and so on.

**Bachelor`s Program and Curriculum  
in Specialty "Finance, Banking and Insurance"  
Educational and professional program «Finance, banking and insurance»**

Code e / d	Components of the educational and professional program	ECTS credits	Form the final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1.1.1	Political Economy	4	exam
CC 1.1.2	Microeconomics	4	exam
CC 1.1.3	Macroeconomics	4	exam
CC 1.1.4	Economic history	5	exam
CC 1.1.5	Mathematics for Economists	6	exam
CC 1.1.6	Probability and mathematical statistics	5	exam
CC 1.1.7	Optimization methods and models	4	exam
CC 1.1.8	Econometrics	4	exam
CC 1.1.9	Computer Science	4	exam
CC 1.1.10	Economics of Enterprise	4	exam
CC 1.1.11	Management	4	exam
CC 1.1.12	Marketing	4	exam
CC 1.1.13	Accounting	5	exam
CC 1.1.14	Labor Economics and Labor Relations	4	exam
CC 1.1.15	International Economics	4	exam
CC 1.1.16	Statistics	6	exam
CC 1.1.17	Social responsibility of business	4	exam
CC 1.1.18	University education and social communication	2	credit
CC 1.1.19	Science of law	4	credit
<b>Total</b>		<b>81</b>	
<b>Optional components of EPP</b>			
<i>Optional Block 1 (University Choice)</i>			
OB 1.2.1	History of Ukrainian Statehood	4	exam
OB 1.2.2	Philosophy	5	exam
OB 1.2.3	Foreign Language	7	exam
OB 1.2.4	Physical Training	4	credit
OB 1.2.5	Labour and Life Safety	4	exam
OB 1.2.6	The technology of crop production	5	exam
OB 1.2.7	Technology of production of livestock products	5	exam
<b>Total</b>		<b>34</b>	
Volume of components of the general training cycle		<b>137</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components of EPP</b>			
CC 2.1.1	Money and Credit	10	exam
CC 2.1.2	Finance	10	exam
CC 2.1.3	The tax system	5	exam
CC 2.1.4	Finance companies	5	exam
CC 2.1.5	Insurance	4	exam
CC 2.1.6	The budget system	5	exam
CC 2.1.7	Investment	4	exam
CC 2.1.8	The banking system	5	exam
CC 2.1.9	Financial market	4	exam
CC 2.1.10	Local finance	4	exam
<b>Total</b>		<b>56</b>	
<b>Optional Block</b>			
<i>Optional Block 2 (by choice of students)</i>			
OB 2.2.1	Budgeting entities	4	exam
	Financial activities of business entities		
OB 2.2.2	Insurance services	4	exam
	Bases of actuarial calculations		



**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.2.3	Tax accounting	4	exam
	Tax control		
OB 2.2.4	International Finance	4	exam
	Financial and credit systems of foreign countries		
OB 2.2.5	Securities Transactions	4	exam
	Currency - Credit and Settlement Banking Transactions		
OB 2.2.6	Logic	3	exam
	Politology		
	Psychology and Pedagogy		
	Ethics and aesthetics		
	Basics of rhetoric		
OB 2.2.7	Regional economy	4	exam
	National Economy		
OB 2.2.8	Enterprise reporting	4	exam
	Audit		
OB 2.2.9	Economic analysis	4	exam
	Financial analysis		
OB2.2.10	Economic and financial risks	4	exam
	Economics of agro-industrial units		
OB2.2.11	Price and pricing	4	exam
	Fundamentals of stock		
OB2.2.12	Leadership and Career Management	4	exam
	Labor market		
OB2.2.13	Cost management	4	exam
	Organization and planning of production activity		
	Launching your own business		
<b>The volume of components of the cycle of special (professional) training</b>		<b>107</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
	Military training	23	
	Educational practice	6	
	Internship	8	
	Preparation of bachelor work (thesis or project)	2	
	State attestation	2	
<b>At the direction of (without military training)</b>		<b>240</b>	

## Annotations of components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Political Economy.** The purpose of discipline is learning future specialists fundamental economic knowledge, forming their logic of economic thinking and economic culture, teaching them the basic knowledge and methods of analysis of economic processes, the ability to make informed decisions about economic problems related to their future practitioners.

Objective: acquisition of appropriate skills of rational economic behavior, based on the conceptual foundations of a market economy, the modern understanding of the functioning of markets and pricing for the services of labor, capital, natural resources according to the type of market structure; skills analysis aggregates, determining factors and the effects of macroeconomic development of business systems and capacity of the state to correct this development in accordance with the objectives and priorities of economic policy.

**Microeconomics.** The aim of the teaching of the discipline is to develop market-oriented economic outlook, knowledge and skills regarding clarification of the mechanisms establishing and rebalancing microsystems and efficiency of economic entities. To achieve this goal the following tasks: learning motives, basic laws and methodological principles of behavior of economic agents in the market conditions at the micro level; universal mastering tools for self-analysis and study of optimal economic decisions in conditions of limited funds and the availability of alternatives.

**Macroeconomics.** The purpose of discipline is to provide students deep theoretical knowledge on the economy - important sphere of human activity, the objective economic laws, familiarity with the methods and conditions of effective management and systematic holistic picture of macroeconomic theory and policy. Logic and structure of the course "Macroeconomics" will allow students to learn the necessary amount of knowledge that makes it possible to achieve a high level of professional competence and economic future professionals. Task. The main objectives of the course is to study issues such as methods for measuring the dynamics of domestic production; forming conditions and consequences of violation of macroeconomic equilibrium; the impact of inflation on unemployment and economic development; methods of state fiscal control; State instruments of monetary policy.

Economic history involves the formation of knowledge about the main stages of formation and direction of economic development and economic research, the conditions and regularities of the evolution of the world economy, economic concepts and directions of the main schools of economic thought.

Subjects of discipline: economics of world historical development, emergence and development of economic ideas and ideas that prevail in the system.

Content modules: economics and economic thought of primitive societies of the period of the day and beginning of the nineteenth century. World economy and main directions of economic thought of the XIX - XX centuries.

**Mathematics for Economists.** The purpose of higher mathematics is the formation of individual students develop their intelligence and ability to logical and algorithmic thinking. The main tasks of the course is to master the basics of mathematical tools necessary for solving theoretical and practical economic problems; ability to independently discover, learn and apply the scientific literature and other information sources and resources on higher mathematics; working out mathematical skills in research

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applications, such as the ability to transfer specific economic problems in mathematical language with the following construction of a mathematical model.

**Probability and mathematical statistics.** The object of study is the patterns of random events and their use for constructing economic stochastic models. The purpose of discipline is the development of basic knowledge and practical skills of the basis of the probabilistic-statistical system, the basic methods of quantitative measurement of randomness of factors affecting any process, the principles of mathematical statistics used in planning, organization and production. management, product quality assessment, systematic analysis of economic structures and processes, application of mathematical methods in the economy. The program involves studying two structural modules - probability theory and mathematical statistics.

Optimization methods and models of educational discipline aimed at mastering the methods for solving optimization problems of financial and farm management.

The object of study - economic, organizational and management systems. Knowledge of the "Optimization models and methods" required students to write a bachelor's and master's theses and research.

**Econometrics.** The purpose of discipline "Econometrics" is of students' knowledge about the quantitative evaluation of economic performance relationships for different sets of economic information, the latter resorting to testing on compliance of certain preconditions. The objectives of the discipline that must be solved in the course of the study are: help students master the methods of construction and implementation of econometric models using a personal computer; gain knowledge about the use of econometric models in economic research; acquiring skills students summarizing the results of statistical analysis and development of appropriate management decisions.

Computer Science object develops knowledge of the principles of construction and operation of computers, organization of computing processes on personal computers and their algorithmization, PC software and computer networks, and effective use of modern information and communication technologies in professional activity. The main objectives of the course is to study the theoretical foundations of computer science and applied skills using economic data processing systems; of programming for the PC; Computer networks in the study of social and economic systems and solving problems of professional orientation. Provides meaningful study four modules: the architecture of the modern computer, advanced software processing of textual information, work with a spreadsheet software MS Excel and modern software processing graphic data.

**Economics of Enterprise.** The economic mechanism of functioning of the company, its development and use of resource potential in order to optimize economic performance.

**Management.** The purpose of discipline is to give students a comprehensive system of knowledge about nature management in enterprises and organizations and agribusiness management skills of production processes in them; conditions for performance of business structures; diagnosis and designing system of agricultural management, appropriate goals and objectives of market economy in agriculture. The objective of the discipline is to train future professionals able to streamline the organizational structure and management system to create enterprise (organization), maintain stability and capacity, ensure the dynamic development and competitiveness, which precedes theoretical preparation of students for the administration and management of the agricultural sector.

**Marketing.** The purpose of discipline "Marketing" is learning and mastering theoretical knowledge and practical skills on the application, the use of tools AMP; organization, planning, implementation, management agromarket activities of agricultural enterprises for the effective functioning of the markets for agricultural products and foodstuffs in Ukraine and abroad, and further development. The task of discipline

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"Marketing" is to get the students knowledge in the field of agricultural marketing; marketing research markets for agricultural products and foodstuffs; forecasting market conditions; inventory management products agricultural enterprises and their quality; pricing; distribution system and marketing of agricultural and food products; promotion of food products in domestic and foreign markets; and gain knowledge in planning agricultural marketing, management and control of agromarket.

**Accounting.** The goal of teaching "Accounting" is to develop the system of knowledge of the theory and practice of accounting in the company. The main objectives of the discipline "Accounting" is the study of methods and rational organization and accounting in enterprises based on the use of progressive forms and national standards; study skills and use of accounting information in management.

**Labor Economics and Labor Relations.** Academic discipline involves the study of issues related to the work as a leading factor of production, the development of labor potential of society, the formation and functioning of the system of industrial relations, labor market regulation. The main sections of the course is the organization, rationing and wages, particularly in agriculture. The problems of employment and social protection, international experience of regulation of social and labor relations and more.

**International Economics.** The purpose of teaching "International Economy" is to develop a system of theoretical and applied knowledge of modern role, functional content and tools of international economics in a highly competitive environment, the laws of the modern global economy. The main objectives of the discipline is to develop in students a holistic idea about the specifics of international business; mastering categorical apparatus used in the commission of international trade; forming a system of knowledge about the theoretical foundations international environment analysis and evaluation of its attractiveness for foreign business.

**Statistics.** The purpose of discipline "Statistics" is to develop basic knowledge of students, including mastering their professional knowledge and practical skills in methods and forms, types and methods of statistical monitoring of agricultural production, development and analysis of statistical data, promotion of economic thought adapted to the requirements of the market economy.

The task of discipline that must be solved in the course of the study: understanding the challenges set before the statistical service of Ukraine in the current market conditions; mastering theoretical positions and mastering practical skills to use statistical methods of analyzing mass social and economic phenomena and processes; skills summarizing the results of statistical analysis and development of appropriate management decisions.

**Social responsibility of business.** Formation of fundamental knowledge of the theory and practice of social responsibility of professional competences, study of theoretical positions and practice of interaction of the state, business, society and the person in the field of social responsibility.

**University education and social communication.** The purpose of teaching this discipline is to summarize: the vision of students of higher education as a subsystem of the educational area and socio-cultural environment, mastery of knowledge, abilities and skills necessary to understand its potential systemoformuyuchoho; knowledge of basic principles, principles, practices and perspectives of the Bologna process. The objectives of the study subjects are: knowledge and understanding of the students of the place and role of higher education in the structure of the educational system, the mastery of experience analyzing the theoretical foundations of the functioning of modern Higher Education; major trends, factors and forms; creating an understanding of integration processes in education, basic principles, results and prospects of the Bologna process.

**Science of law.** Purpose: to provide basic training of students in the field of formation of students basic knowledge of the theory of law, mastering the system of basic concepts of jurisprudence, mastering the most important provisions of certain legal branches and developing skills in their application in practice.

### **Selective components**

#### ***Sample Block 1 (University of Choice)***

Annotations of disciplines "History of Ukrainian Statehood", "Philosophy", , "Foreign Language (English, German, French, Spanish)", "Physical Training", "Labour and Life Safety", see Section 2.1.

**The technology of crop production.** Scientific bases of crop production. Modern agricultural technologies. Technological maps of growing crops. The concept of the programmable growing crops. The concept of the technology of storage, processing of various types of crop production.

**Technology of production of livestock products.** The current state of the livestock industry. Forage. The impact of standardized feeding, breeding, means the animals on their level of performance. Milk, meat, eggs, wool etc.

## **2. SPECIAL PREPARATION CYCLE**

### **Compulsory components**

**Money and Credit.** The purpose of the course the course "Money and credit" is to give students theoretical and practical knowledge for the management of the organization cash flow (cash flows), to form the students a theoretical basis for the subsequent mastering the practice of using monetary tools in the system of economic regulation Ukraine . It is important is to study economic relations with a turnover of money, including as a means of circulation of credit relations in modern economy.

**Finance.** The purpose of discipline "Finance" is to develop basic knowledge of finance theory, learning patterns of their operation at the macro and micro levels as the theoretical basis of financial policy and financial system. The educational goal of the discipline involves the acquisition of knowledge in all areas of operation of the financial mechanism, namely form students of finance conceptual apparatus for use in practice; provide information on finances, the financial system of the state and its role in the functioning of the economy; learn to apply their knowledge in practice, make informed decisions and to solve the problem.

The tax system Objective: To ascertain the economic nature of taxes, their nature, functions, objectivity in market conditions; disclosure of the contents of tax policy, tax system, tax mechanisms and their components, learning practical mechanism for the application of certain taxes and duties, development of requirements to fill tax returns and tax calculation mechanism.

Objective: To study the theoretical and organizational bases of tax calculation methodology and manner of payment of taxes and obligatory payments of businesses and individuals.

**Finance companies.** The purpose of teaching the course "Business Finance": the provision and deepen students' knowledge of the theory and practice of financial relations business entities. Tasks of the course: clarify the nature of the financial resources of enterprises, methods and sources of their formation of financial activity; gaining skills settlements of receipts, income, its distribution, the impact of taxation on the use of profits;

determine the need for working capital, sources of financing reproduction of fixed assets and their efficient use; mastering methods of assessing the financial condition of sanitation companies.

**Insurance Purpose:** formation of 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. Objective: sustainable knowledge acquisition by the students of the theory and practice of management of the insurance company; insurance services; risk assessment; settlement of insurance claims.

**The budget system purpose of the discipline** - formation of knowledge on the organization and functioning of the budget system and its role in the socio-economic development. As a result of the discipline the student should know: the role and place of budget redistribution relations of society; general principles of the budget system and principles of the budget system; nature, functionality and features of the structure of the main elements of the budget system (consolidated budget, the state budget, local budgets); objectives, principles and methods of budget planning; basic techniques and sources of revenues, directions and forms of financing costs; common methodology for determining the volume of public spending to ensure the implementation of relevant state functions; basic principles and forms of credit, technology strategy and debt management.

**Investment Objective discipline** - form students about the importance of a comprehensive concept of project analysis for business development prospects, possible alternative approaches and implementing market study projects to meet social needs. The main objectives of the course are: consideration of the theoretical foundations of project analysis, object, purpose and basic concepts and principles of project analysis, project life cycle; study places the concept of cost-benefit analysis of the project, explicit and implicit benefits and costs, opportunity cost concept as a key project analysis; study the impact of changes in the value of money over time, concepts and methodological tools of evaluation time value of money and its use in financial calculations, determine the future and the present value of money in financing arrangements; substantiation standard financial criteria and informal decision-study method of calculation of integrated indicators, comparing projects using different criteria.

**The banking system.** Educational-methodical complex of discipline "Banking system" provides understanding of the fundamentals of the banking system, the aggregate banking operations and their characteristics, the basic principles of relationship banking institutions, order preparation and content of financial reporting, development of students theoretical problems and practical skills of self-realization transactions in the current economic conditions. The purpose of discipline "Banking system" is mastering basic principles of banking operations at a level that after training they can best navigate the issues of the banking system will continue to adapt new knowledge in the process of the specialty.

**Financial Markets** purpose of discipline is to enhance the knowledge and skills students about the deepening of the financial market operations, the mechanism of their characteristics and development of global stock, the policy of Portfolio Investment. Tasks of the course - to submit the required extent theoretical material, which includes research and development of domestic and foreign scientists; give structural understanding of the principles in the financial relations between issuers, investors, professional participants, regulators and self-regulatory organizations; define a set of measures to ensure optimum risk in the financial market and establish a broad and correct idea of the relationship of students the course "Financial Markets" with other professional disciplines.

**Local finance Objective:** to provide and deepen students' knowledge on the nature and role of local finance in the development of economic and social infrastructure of administrative units, the budget process at the regional level. Tasks of the course: to give the required extent theoretical material, which will include modern scientific developments, both domestic and foreign scientists and economists; - To give the correct understanding of the principles in the financial relations between the state, local, economy and population; uncover ways to use these laws in practice financial work; define a set of measures to ensure the use of finance as one of the effective tools of economic policy of the local government.

### **Selective components**

#### ***Sample block 2 (by choice of students)***

##### ***Sample block 2.2. 1***

**Budgeting entities.** The purpose of the discipline is to create a system of knowledge on the theory and practice of financial planning, financing operational and investment activity of the enterprise, forecasting the results of its work in conditions of market relations and dynamic economic development. It is important to study the essence of financial relations and the nature of their impact on society and the methodological foundations of financial budgeting, planning and forecasting, identifying needs and forming financial resources, drawing up budgets and financial plans of economic entities.

**Financial activities of business entities purpose of the course** - is to provide students with theoretical knowledge about the development and implementation of integrated entities methods of money management, financial planning by traditional technology and budgeting, analysis of the internal and external environment, which forms the economic strategies of enterprises of different ownership and organizational - legal forms. The task of discipline - to form a theoretical understanding of financial concepts and practical methods and tools of processing financial information to be used for decision-making in the field of financial needs of the company and determine the optimal proportions in the assets and liabilities of the company. The object of the course is the financial organization of enterprises of all forms of ownership and organizational forms, key areas of financial management companies in the domestic and foreign markets.

##### ***Sample block 2.2.2***

Insurance services aim of the course "Insurance services" is to get the students basic knowledge in the theory and practice of insurance. The challenge of course is to clarify the need and merits of insurance in order to create an effective system to protect the interests of citizens, businesses and the state, acquire the skills to implement reinsurance and financial activities of the insurer. In the process of teaching turns objective need insurance, revealed his nature, functions, principles and role in a market economy; highlights issues of organization on the lines of the insurance market and state regulation of insurance; The conditions of personal, property and liability insurance, reinsurance positions with national and international experience; examines features and ways to improve the financial activities of insurers.

**Basics of actuarial calculations.** The purpose of studying the course "Actuarial calculations" is the students' acquisition of the necessity, essence and content of the main tasks of actuarial calculations, theoretical bases of risk management, studying and processing of calculations of tariff rates, insurance premiums, as well as determination of insurance tariffs for life insurance in order to improve the insurance market and insurance services.

Tasks of the discipline to be resolved in the course of its study: identification and grouping of risks within the insurance aggregate, assimilation and determination of the mathematical probability of occurrence of an insured event, elaboration and mathematical substantiation of the necessary expenses for the insurance business, as well as the necessary reserve funds of the insurer.

### ***Sample block 2.2.3***

**Tax accounting.** Studying of theoretical and practical bases of the procedure of tax accounting, tax calculations and reporting. The discipline covers theoretical and practical aspects of tax accounting, the order of acceptance and computer processing of accounting documents in the bodies of the state tax service, and so on.

**Tax control.** The purpose of teaching is to develop knowledge and skills in substantiating managerial decisions with varying degrees of uncertainty and risk.

### ***Sample block 2.2.4***

**International Finance.** The system of international finance, the evolution of the global monetary system, international financial market and its structure, foreign exchange and foreign exchange transactions, bank loans international market, especially the functioning of the European market.

**Financial and credit systems of foreign countries.** The rule of law and the main stages of evolution, the principles of the construction and the peculiarities of the forms of organization of monetary and credit systems of foreign countries in the conditions of the existence of developed financial markets and an extensive system of credit and financial institutions.

### ***Sample block 2.2.5***

**Securities Transactions.** The work program of the academic discipline "Securities Transactions" will help students to understand the specifics of the stock market activity, especially the implementation of issuing and investment operations of banks, to understand the differences in securities portfolios, to know the essence of accounting and analysis of securities in the portfolios of the bank, the content of the risks of investment activities of banks on the securities market, understand the content of securities listing organization in the world and in Ukraine, and also know the functions of banks as underwriters, dealers and brokers. Particular attention is paid to the methodical principles of the activity of trading in securities, as well as issues of securities trading.

**Currency - Credit and Settlement Banking Transactions.** The aim is to form future specialists with specialist knowledge on the organization of work of credit institutions and the principles of functioning of the system of foreign exchange markets and the system of international lending in general. The discipline's task consists in mastering students theoretical knowledge and acquiring practical skills in performing credit-settlement and currency transactions, carried out in servicing foreign economic activity of exporters and importers.

### ***Sample block 2.2.6***

**Logic Objective:** To provide students basic training in the fields of system knowledge of basic laws and forms of logical thinking, forming conscious attitude to the process of right thinking through scientific concepts and terms to familiarize students with the theory of logical thinking. The task of discipline is shaping students' skills of correct logical thinking for making good decisions in the future professional work, to participate in discussions and business communication, information processing, for logical and correct

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substantiation arguments and beliefs opponents; familiarizing students and methodological assistance in mastering a certain amount of knowledge about the means of intellectual activity, its shape and laws, understanding and assimilation of features forms and laws of thought; providing logical and methodological level studies while training.

**Political science** - Laws, structure and functions of political science. Power and power relations. Political system of society, place and role in it state. Political consciousness and political culture. Politics and national relations. Politics and ecology. National-state development of Ukraine.

**Psychology and Pedagogics.** Formation of knowledge about the psyche of the individual as the highest value of society; awareness of the nature of the mechanisms of mental processes, states, personality traits as the foundation of its formation in the process of education and training. The acquisition of key terms and concepts of psychology and pedagogy at their reproduction and interpretation; gaining basic skills to apply them in practice to improve competitiveness in professional social and psychological sphere.

**Ethics and aesthetics.** Gives knowledge about the peculiarities and characteristics of the moral and artistic relation of man and the world, mastering the basic functions performed by ethics and aesthetics in the knowledge of all spheres of human existence, the structure of these spheres, the content of the main categories and the significance of such knowledge for work in different areas of human activity.

**Basics of Rhetoric.** Subject of rhetoric, the essence of the concepts and all sections of classical rhetoric. Modern science: neorhetoric, style, poetics, pragmatics, theory of communication etc.

**Foreign Language.** Language education includes learning, reading, and teaching of a second language or foreign language other than native language.

### ***Sample block 2.2.7***

**Regional economy.** The objective of the discipline is learning the theory of productive forces and regional economy and regional development of scientific bases of regional economic policy; mastery of knowledge about territorial and sectoral structure of economic complex of Ukraine and its economic regions and so on. The aim of the course is to develop knowledge on the theoretical and practical bases of the territorial organization of the productive forces of Ukraine, the current state and trends of regional economic development.

**National Economy.** The theoretical and organizational framework for regulating the national economy. Forecasting, macroeconomic planning and programming in the regulation of the national economy. Methods of state regulation of the economy.

### ***Sample block 2.2.8***

**Enterprises Reporting.** General reporting requirements. Balance sheet. Income statement. Statement of cash flows. Statement of changes in equity. Errors correction and changes in the financial statements. Overall and consolidated reporting. Financial report of a small business. Tax reporting. Statistical and special reports.

**Audit.** The application of elements of the organization registers of synthetic and analytical accounting. Accounting for funds, payments, inventory, fixed assets, intangible assets, remuneration systems, variants of production costs, the definition of production costs. Functions of the audit: validation of the balance sheet and recording of profit and loss, analysis of accounting, its compliance with the law; respect for the equality of shareholders rights during the distribution of dividends and voting.

**Sample block 2.2.9**

**Economic analysis.** The purpose of discipline study course "Economic Analysis" is to develop knowledge about methods of systematic evaluation of agricultural enterprises, identify internal reserves rational use of material, labor and financial resources. The logic and structure of the course "Economic Analysis" will allow students to learn the necessary amount of knowledge that makes it possible to achieve a high level of professional competence and economic future professionals. Task. On the methodological principles of civilizational paradigm of society form the modern economic thinking and outlook of students to ensure their mastery of knowledge and methods of analysis of economic laws and processes.

**Financial Analysis.** The purpose of discipline "Financial Analysis" is to develop in students the modern economic thinking and system expertise in the theory and methodology of financial analysis, a clear idea of the content of financial and economic activity in a market economy, the causal relationship between economic phenomena and financial processes, structure information supply management; skills of management decisions to address the financial situation; mastery of skills and financial analysis. The objectives of the discipline that must be solved in the course of the study are: formation of students of modern economic thinking and system expertise in the theory and methodology of financial analysis, a clear understanding of the content of financial and economic activity in a market economy, the causal correlation bandages economic phenomena and processes financial structure with information of management; skills of management decisions to address the financial situation; mastery of skills and financial analysis.

**Sample block 2.2.10**

Economic and financial risks purpose of discipline is mastering theoretical knowledge of students' practical skills in the mechanism of determining the sources and causes of risk, stages and activities, under which there is a risk, definition of risks that could threaten the efficient financing of the company, and use of skills in the risk management and economic security. Tasks of the course: to master the content, the nature, importance and role of risk management and economic security of business structures in the modern economy; master the basic principles defining risk factors external and internal environment of functioning entities; master the basic methods of risk assessment in business entities; master the basic forms and methods of system design to minimize risks of business entities; master the basic techniques and methods to identify and address the causes of the factors that contribute to the risk of business entities; learn methods of effective risk management in the activity of economic entities; form students the skills and knowledge necessary for decision-making under uncertainty, the implementation of a rational choice of a plurality of possible alternative options, the ability to take risks within reasonable limits.

**The economy of agro-industrial formations.** The system of production relations in relation to the productive forces in agriculture. Ways and methods of rational use of land, material and labor resources, intensification of agricultural production on the basis of scientific and technological progress of specialization, cooperation and integration of agribusiness enterprises, development of commodity-money relations, ways to increase production efficiency.

**Sample block 2.2.11**

**Price and pricing.** Theories of pricing, the method of pricing. Limit value of the price, methodological atypical formation of prices in the conditions of inflation, ensuring the equivalence of accounting and prices in the agro-industrial complex.

Fundamentals exchange Discipline "Fundamentals of stock activity" is studying the mechanism of implementation and technology exchange activities of commodity exchanges in the country and in emerging economies. The purpose of the study course - the formation of future specialist theoretical foundations and practical skills of the exchange activity and effective use of exchange operations in its future activities. Course description: Formation at students knowledge on the organization of exchange activities; acquisition of practical skills: organization of trade on the exchange of goods, securities, currencies; of relationships with brokers; exchange information for use of high-efficiency production and marketing of agricultural products.

**Sample block 2.2.12**

**Leadership and Career Management.** We are working on questions of professional and social competences for effective career development, assessment of leadership and self-development, issues of labour motivation and management of mini-groups, building of career and organization of effective team development, young specialist in the labour market, modern professional development trends are analysed.

**The labor market.** The issues of functioning and regulation of the labor market, development of its infrastructure, analysis of the labor market, state support for employment, improvement of social protection and overcoming of unemployment of the population, development of the international labor market are considered.

**Sample block 2.2.13**

**Cost management.** The purpose of the discipline is to acquire knowledge and skills on the laws of formation expenses by type, responsibility centers and carriers to minimize their level and justification of optimal economic decisions. Tasks of the course is to expand the classification and cost structure, their characteristics; the essence of domestic and foreign systems and methods of cost accounting for production and content assessment of their impact on the cost management; method of management of certain types of expenses as productive and unproductive nature; method of calculation of the planned cost of goods, works and services costing indirect costs; new approaches to the management of operations, including modern technologies in production and operations management.

**Organization and planning of production activity.** Objective: to provide students with knowledge of the theory and practice of functioning of organizations and planning in the changing conditions of the modern market socio-economic environment, the regulation of processes that occur in them in conjunction with the external environment, etc .; assimilation of the main methodical approaches to the analysis of the internal and external environment of organizations; acquisition of skills in building organizational structures of different types of organizations; acquisition of the skills of transformation, creation of the image and culture of organizations.

**Launching your own business.** Entrepreneurship and business in the agrarian sector: the essence, tasks, advantages. Characteristics of business structures. Preparation of business plans. Create your own business. The study of topics that are necessary for the successful creation of their own business, including thinking, ideation, planning, actions and strategy. Instead of just considering the theoretical course, the lessons will focus on the whole process of actually creating your own business. The course includes lectures, practical discussions, discussions, case studies, etc

**Bachelor**  
**field of knowledge "Management and Administration"**  
**in specialty "ACCOUNTING AND TAXATION"**

Form of Training:	Licensed number of persons:
– Full-time	150
– Part-time	140
Duration of Training	4 years
Credits	240 ECTS
Language of Teaching	Ukrainian, English
Qualification	Bachelor in Accounting and Taxation

### Concept of training

The specialty "Accounting and Taxation" trains specialists aimed at in-depth study of the theory and practice of accounting, auditing and taxation in the agricultural sector of the economy. An important direction of such training is the orientation of students on independent work, the development of creative activity of finding effective solutions to the problems studied, acquiring skills by the study of scientific literature, current legislation and the ability to meet international standards and critically evaluate the process of analysis, auditing and taxation in specific enterprises, to develop effective proposals for the accounting and management improvement in general. Graduates have the right to occupy the positions of chief accountant; accountant in the agricultural sector, SMEs, trade; auditor, auditor-diagnostician, accountant, specialist of tax and controlling and auditing services, financial, bank and budgetary institutions.

### Practical training

Practical training is carried out at the following enterprises:

- PS RF "O.M. Muzychenko Velykosnitynske" of the NULES of Ukraine (Kyiv region)
- "Agronomic Research Station" of the NULES of Ukraine (Kyiv region)
- Training and Research Farm "Vorzel" of the NULES of Ukraine (Kyiv region)
- Other bases of practical training of students of the University from among leading institutions, enterprises, organizations of any ownership pattern 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 for Bachelor theses

1. Accounting and audit of the financial results.
2. Accounting and cost analysis of grain production.
3. Accounting and audit of fixed assets and intangible assets depreciation
4. Accounting and audit of Income tax payments to the budget
5. Accounting and audit of payments to suppliers and contractors

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Chief accountant; deputy chief accountant; senior accountant; chief cashier; accountant of I category; accountant of ii category; accountant; auditor; assistant auditor; senior accountant-auditor; accountant-auditor of I category; accountant-auditor of II category; accountant-auditor; accountant-expert; expert-accountant; chief auditor; head cashier, etc.

**Bachelor`s Program and Curriculum  
in Specialty «Accounting and Taxation»  
Educational-professional program «Accounting and Taxation»**

Code e / d	Components of the educational and professional program	ECTS credits	Form the final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1.1.1	Economic History	4	exam
CC 1.1.2	Probability theory and Mathematical Statistics	4	exam
CC 1.1.3	Mathematics for Economists	6	exam
CC 1.1.4	Computer Science	4	exam
CC 1.1.5	Science of law	4	exam
CC 1.1.6	Theory of Accounting	8	exam
CC 1.1.7	International Economy	4	exam
CC 1.1.8	Organization and Planning of Production in Agricultural	4	exam
CC 1.1.9	University education and social communication	2	credit
<b>Total</b>		<b>40</b>	
<b>Optional components of EPP</b>			
<i>Optional Block 1 (University Choice)</i>			
OB 1.2.1	History of Ukrainian statehood	4	exam
OB 1.2.2	Foreign language	9	exam
OB 1.2.3	Philosophy	5	exam
OB 1.2.4	Labour and life safety	4	exam
OB 1.2.5	Physical training	4	credit
OB 1.2.6	Crop Production Technology	5	exam
OB 1.2.7	Livestock Production Technology	5	exam
<b>Total</b>		<b>36</b>	
Volume of components of the general training cycle		<b>76</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components of EPP</b>			
CC 2.1.1	Taxation System	4	exam
CC 2.1.2	Economics of Enterprise	4	exam
CC 2.1.3	Management	4	exam
CC 2.1.4	Marketing	4	exam
CC 2.1.5	Money and Credit	4	exam
CC 2.1.6	Finance	4	exam
CC 2.1.7	Labor Economics and Social and Labor Relations	4	exam
CC 2.1.8	Statistics	6	exam
CC 2.1.9	Analysis of Economic Activity	4	exam
CC 2.1.10	Financial Accounting	8	exam
CC 2.1.11	Managerial Accounting	4	exam
CC 2.1.12	Reporting of the Enterprises	4	exam
CC 2.1.13	Accounting in Banks	4	exam
CC 2.1.14	Accounting in the public sector	4	exam
CC 2.1.15	Accounting and Reporting in Taxation	4	exam
CC 2.1.16	Audit	4	exam
CC 2.1.17	Political Economy	4	exam
CC 2.1.18	Microeconomics	4	exam
CC 2.1.19	Macroeconomics	4	exam
CC 2.1.20	Economic and Mathematical Modeling	4	exam
CC 2.1.21	Econometrics	4	exam
CC 2.1.22	Economic legislation	4	exam
<b>Total</b>		<b>94</b>	

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

<b>Optional Block</b>			
<i>Optional Block 2 (by choice of students)</i>			
OB 2.2.1	Political Science	4	exam
	Sociology		
	Religious Science		
	Logics		
	Basics of Rhetoric		
	Ethics and Aesthetics		
	Psychology and Pedagogics		
	Labor Sociology		
OB 2.2.2	Fundamentals of stock activities	5	exam
	Price and Pricing		
OB 2.2.3	Agribusiness Organization	4	exam
	Cost management		
OB 2.2.4	Information systems and technologies in accounting and auditing	4	exam
	Computerized accounting in the public sector		
OB 2.2.5	Agricultural Economy	4	exam
	Environmental Economics		
OB 2.2.6	Insurance	4	exam
	International Taxation		
	Mortgage Lending		
	Banking System		
	Financial Market		
OB 2.2.7	Finance of the Enterprise	4	exam
	Investment		
OB 2.2.8	Accounting in Sectors of the National Economy	4	exam
	Accounting in Foreign Countries		
OB 2.2.9	Project Analysis	5	exam
	Models and Methods in Analysis and Audit		
OB 2.2.10	Basics of Research in Economics	4	exam
	Social Responsibility		
OB 2.2.11	Regional Economy	5	exam
	National Economy		
<b>Total</b>		<b>47</b>	
<b>The volume of components of the cycle of special (professional) training</b>		<b>141</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
	Military training	23	
	Educational practice	6	
	Internship	10	
	Preparation of bachelor work (thesis or project)	5	
	State attestation	2	
<b>At the direction of (without military training)</b>		<b>240</b>	



## Annotations of components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Economic History.** Economic theory in the era of pre-capitalist modes of production. The classical school of bourgeois political economy. Economic thought in Ukraine. Neoliberalism and its various forms. The development of Soviet economic thought. Economic thought of the transition period.

**Probability theory and Mathematical Statistics.** Events, probability, repetition of experiments, the laws of probability distribution, numerical characteristics of random variables, system functions and random variables, probability theory, probability models of economic problems.

**Mathematics for Economists.** Provides: forming of individuality of students to develop their intelligence, logical skills and algorithmic thinking; mastering the basics of mathematical tools necessary to solve theoretical and practical problems of the economy; ability to examine independently the scientific literature on mathematics and apply it; to increase the general level of mathematical culture; develop the ability to make mathematical models of certain economic processes; teaching methods of processing and analysis of the results.

**Computer Science.** Principles of construction and operation of computers, organization of computing processes on the PC and their software, work on a PC with algorithmic programming languages, program structure and recommendations for its writing. Effective use of modern information and communication technologies in professional activity.

**Science of law.** Purpose: to provide basic training of students in the field of formation of students basic knowledge of the theory of law, mastering the system of basic concepts of jurisprudence, mastering the most important provisions of certain legal branches and developing skills in their application in practice.

**Theory of Accounting.** Subject and method of accounting. Balance sheet. Documentation as part of the method of accounting system accounts. Methodology of accounting processes in business. Chart of Accounts. Registers and forms of accounting.

**International Economy.** Marketing in foreign economic activity. Export-import transactions of raw materials, industrial and agricultural goods. Joint business activities. Methods of foreign trade. State regulation of foreign economic relations.

**Organization and Planning of Production in Agricultural Enterprises.** The scientific basis for the organization, production planning, utilization of productive capacities in various spheres of agricultural enterprises, organization of industrial and economic relations in the AIC in market conditions.

**University Education and Social Communication.** Preparing students to study at the university in accordance with modern international integration processes in education in the context of the Bologna Declaration.

#### Selective components

##### *Sample Block 1 (University of Choice)*

Annotations of disciplines “History of Ukrainian Statehood”, “Philosophy”, , “Foreign Language (English, German, French, Spanish)”, “Physical Training”, “Labour and Life Safety”, see Section 2.1.

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**Crop Production Technology.** Scientific bases of crop production. Modern agricultural technologies. Technological maps for the crops growing. The concept of the programmable growing of crops.

**Livestock Production Technology.** The current state of the livestock industry. Forage. Effect of normalized feeding and breeding on their productivity. Milk, meat, eggs, wool production etc.

## 2. SPECIAL PREPARATION CYCLE

### Compulsory components

**Taxation System.** The study of theoretical and organizational bases of taxation, calculation methodology and procedure for payment of taxes and obligatory payments of businesses and individuals.

**Economics of Enterprise.** The economic mechanism of functioning of the company, its development and use of resource potential in order to optimize economic performance.

**Management.** Theoretical Foundations of Management, manager in the management system. The motivation and rules of managerial activities. The mechanism of control and accountability in the management system.

**Marketing.** The essence, content of marketing and its concept and system characteristics of modern marketing and marketing policies: heading, pricing, communication and distribution.

**Money and Credit.** Origin, essence and function of money and credit, the form of money and credit relations, structure of monetary and credit systems, patterns of money, the stability of financial systems and areas of improvement monetary and credit relations in Ukraine and particularly in agriculture.

**Finance.** Essence, types and functions of agribusiness finance. Finance of the companies, formation and use of profit, working capital lending, financial support, reproduction of fixed assets, financial indicators and their evaluation.

**Labor Economics and Social and Labor Relations.** Examines the methodology and methods of analysis of internal labor market planning and employment indicators at the enterprise; skills for solving practical problems of labor economics.

**Statistics.** The organization of supervision, construction and analysis of statistical data using methods of groupings, averages and indicators variation, correlation and dispersion calculations, evaluation of time-spatial changes of mass social phenomena.

**Analysis of Economic Activity.** Theoretical, methodological and organizational bases of economic activity analysis of economic entities. Analytical assessment of business processes of an economic entity and their resource support. Financial analysis of economic activity of an economic entity.

**Financial Accounting.** Methods and organizations of the financial accounting of assets at the enterprise using advanced forms of national standards. Methods and organizations of the financial accounting of the capital and obligations at the enterprise using advanced forms of national standards.

**Managerial Accounting.** Principles and methods of managerial accounting, its place and role in the management of the company; acquiring skills to apply appropriate methods and techniques in the cost accounting and calculation in order to make effective management decisions.

**Reporting of the Enterprises.** General reporting requirements. Balance sheet. Income statement. Statement of cash flows. Statement of changes in equity. Errors correction and changes in the financial statements. Overall and consolidated reporting. Financial report of a small business. Tax reporting. Statistical and special reports.

**Accounting in Banks.** General theoretical basis and principles of accounting; technical support and accounting software; accounting nomenclature and accounting information media; circulation of documents; accounting policies of the bank; organization of the accounting of the key banking operations.

**Accounting in the public sector.** Fundamentals of accounting in budgetary institutions. Revenue, expenditure and payment transactions. Accounting for non-current and current assets, equity.

**Accounting and Reporting in Taxation.** Accounting and reporting procedure for income tax, VAT, excise tax, personal income and local taxes and fees, property and resource payments and the accounting and reporting in the special tax regime.

**Audit.** The application of elements of the organization registers of synthetic and analytical accounting. Accounting for funds, payments, inventory, fixed assets, intangible assets, remuneration systems, variants of production costs, the definition of production costs. Functions of the audit: validation of the balance sheet and recording of profit and loss, analysis of accounting, its compliance with the law; respect for the equality of shareholders rights during the distribution of dividends and voting.

**Political Economy.** Commodity production and business. Social reproduction and economic growth. Basic social forms of production and their evolution. World economy and global market.

**Microeconomics.** Modern elements of the microeconomic environment and their activities in terms of the social market economy. Techniques and methods of making economic decisions at the micro level for the businesses to survive in the current economic environment of the market economy.

**Macroeconomics.** Macroeconomic processes in terms of construction and development of market economy in Ukraine. The system definition, problem solving and ways to achieve solutions. Establishing relationships and determine the order of relations between objects and subjects of macroscopic environment. Solving macroeconomic challenges.

**Economic and Mathematical Modeling.** Creating models of economic systems through various economic and mathematical models and solving problems to anticipate the construction and management of modern agricultural enterprises. Methods of nonlinear programming, solving the transport problem and other urgent economic problems of the agricultural production.

**Econometrics.** The quantitative evaluation of the relationship between economic indicators for different sets of economic information, resorting to testing the latest on compliance of certain preconditions and to determine methods for quantitative measurement of relations, which should be used in each case in accordance with the peculiarities of economic information.

**Economic legislation.** It is studied the basic legal institutions of general economic legislation, as well as the regulation of certain spheres of economic life on the basis of economic and commercial procedural legislation of Ukraine.

### **Selective components**

#### ***Sample block 2 (by choice of students)***

##### ***Sample block 2.2.1***

**Political Science.** Laws, structure and functions of political science. Power and power relations. The political system of society, the place and role of the state in it. Political consciousness and political culture. Politics and national relationships. Politics and ecology. National and state development of Ukraine.

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**Sociology. Essence of Sociology.** Formation of human behavior in the workplace and place of activity in the process of motivation system and means of social control. The role of labor and small groups in achieving production purposes.

**Religious Science.** This is a complex area of human cognition that studies patterns of emergence, history and general characteristics of religious beliefs. It explores social and historical nature of religion, its mechanism of social ties with the spiritual, political and economic systems of society.

**Logics.** Forming of logical culture of professional thinking; understanding of general cultural significance of logical theory; development of natural capabilities of human thinking, enhancing its creative potential; clarifying the logical foundations of thinking activity formalization, algorithmic information technology.

**Basics of Rhetoric.** Subject of rhetoric, the essence of the concepts and all sections of classical rhetoric. Modern science: neorhetoric, style, poetics, pragmatics, theory of communication etc.

**Ethics and Aesthetics.** Gives knowledge about the features and characteristics of moral and artistic relationship between man and the world, the development of basic functions performed by the ethics and aesthetics in the knowledge of all areas of human life, the structure of these areas, the content of the main categories and value of such knowledge to work in different areas of human activity .

**Psychology and Pedagogics.** Formation of knowledge about the psyche of the individual as the highest value of society; awareness of the nature of the mechanisms of mental processes, states, personality traits as the foundation of its formation in the process of education and training. The acquisition of key terms and concepts of psychology and pedagogy at their reproduction and interpretation; gaining basic skills to apply them in practice to improve competitiveness in professional social and psychological sphere.

**Labor Sociology.** The essence, content, nature and function of labor. Formation of human behavior in the workplace activity. The role of labor and small groups in achieving production goals. Optimization of socio-psychological climate in the team.

### ***Sample block 2.2.2***

**Fundamentals of stock activities.** Fundamentals of exchange activity. Commodity, stock and currency exchange. Stock exchange transaction, the procedure of agreements conducting and exchange trading mechanism.

**Price and Pricing.** Theories of pricing, pricing methods. Marginal utility of price, methodological atypical pricing in terms of inflation, ensuring equivalence of accounting and prices in AIC.

### ***Sample block 2.2.3***

**Agribusiness Organization.** Entrepreneurship and business in agriculture: the nature, objectives, benefits. Characteristics of businesses. Drawing up of business plans.

**Cost management.** The purpose of discipline is to present the necessary theoretical foundations, methodological approaches and practical knowledge of the principles, techniques and methods development and implementation of the overall strategy and direction of production activity of industrial enterprises; to develop and implement modern industrial system, including the development of the production process, decisions concerning the location of production facilities, design enterprise products, the introduction of standards and regulations for works; to plan and control current operation of the production system. To achieve this goal are made the following tasks: research productions in their relationship that formed under the influence of objective economic laws

and subjective factors; scientific substantiation of decisions on the assessment of business plans with an objective assessment of their performance.

#### ***Sample block 2.2.4***

**Information systems and technologies in accounting and auditing.** Computer technology of accounting in agricultural enterprises.

**Computerized accounting in the public sector.** It is studied computer technology accounting in the public sector.

#### ***Sample block 2.2.5***

**Agricultural Economy.** The system of industrial relations in conjunction with the productive forces in agriculture. Ways and means of rational use of land, material and labor, intensification of agricultural production based on science and technology, specialization, cooperation and integration of agricultural enterprises, the development of commodity-money relations, ways to improve production efficiency.

**Environmental Economics.** Ecology and modern agriculture. Ecological agriculture and crop production. Environmental issues of the livestock concentration. Environmental expertise, assessment, monitoring and forecasting with the use of mathematical modeling. Environmental law, legislative support. Interaction between environmental and economic factors, maintaining proper environmental quality, resource conservation. Indicators of ecological, economic and social efficiency of environmental measures, changes of psychological conditions and socio-hygienic condition.

#### ***Sample block 2.2.6***

**Insurance.** The essence, principles and role of insurance. Classification of insurance, insurance risks and their assessment. Insurance market and its characteristics, insurance companies, government regulation of insurance activity. Personal insurance. Property insurance of the companies and individuals.

**International Taxation.** Examines fundamental theoretical foundations of international tax practice of agreements on avoidance of double taxation and using methods of international tax planning.

**Mortgage Lending.** Organization of the mortgage in financial institutions and principles of the system of mortgage lending in general. Studying theory and practice of credits secured by real estate.

**Banking system.** Revealed the theoretical aspects of the study of various banking services, from traditional deposit, credit and cash transactions that form the basis of banking - to the latest forms of monetary and financial instruments that are used by banking institutions.

**Financial market.** Features of the money market, Ukrainian and international capital markets, foreign exchange and derivatives segment, the specifics of various financial institutions.

#### ***Sample block 2.2.7***

**Finance of the Enterprise.** Essence, types and functions of the company's finance. The system of noncash and cash payments. The formation and use of gross and net income and earnings, working capital lending, financial support, reproduction of fixed assets.

**Investment.** Methodological bases of investment. Forms, objects and areas of investment. Investment risks. Financial support of investment. Budgeting of project management and investment process.

#### ***Sample block 2.2.8***

**Accounting in Sectors of the National Economy.** Features of methods and organization of accounting in trade enterprises, budgetary institutions and credit institutions and industry.

**Accounting in Foreign Countries.** Theory and practice of financial and managerial accounting in foreign countries; acquiring skills in organization of accounting, analysis and control based on existing legislation.

#### ***Sample block 2.2.9***

**Project Analysis.** Alternatives and implementation of market approaches to meet social needs. The study of modern methods of investment projects management of economic entities.

**Models and Methods in Analysis and Audit.** The essence, principles and methodological bases of methods and models in the development of managerial decisions. Methods of solutions development for the breakeven of the enterprise. Methods and models of management development solutions for real and financial investments and assets. Methods and models of strategic management and forecasting of the enterprise.

#### ***Sample block 2.2.10***

**Basics of Research in Economics.** Scientific education of student, research in economics, methodology of scientific research.

**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.

#### ***Sample block 2.2.11***

**Regional Economy.** Scientific basis of productive forces and economic organization based on natural resources, scientific and technological progress. Features of economic development of individual regions of Ukraine.

**National Economy.** The theoretical and organizational framework for regulating the national economy. Forecasting, macroeconomic planning and programming in the regulation of the national economy. Methods of state regulation of the economy.

**Bachelor**  
**field of knowledge "Management and Administration"**  
**in specialty "ENTREPRENEURSHIP, TRADE AND STOCK ACTIVITIES"**

Form of Training:	Licensed number of persons:
– Full-time	75
– Part-time	140
Duration of Training	4 years
Credits	240 ECTS
Language of Teaching	Ukrainian
Qualification	Bachelor in Entrepreneurship, Trade and Stock Activities

### Concept of training

The specialty "Entrepreneurship, trade and stock activities" provides training of highly skilled professionals in the field of entrepreneurship, stock trading and trade, namely, competent managers and experts in the organization and specifics of agribusiness, stock trading and trade. The task of such training is the development of communicative, socio-psychological and organizational and economic competencies, skills of communication with a foreign language in professional activities, formation of theoretical and practical knowledge on the organization and conduct of business, student acquisition of competencies in determining priority areas and organization of their own business, - plans, adoption of effective business decisions on the domestic and foreign markets, the ability to use the acquired knowledge on the issues of trading, and exchange operations in practice.

### Practical training

Practical training is carried out at the following enterprises:

- PS RF "O.M. Muzychenko Velykosnitynske" of the NULES of Ukraine (Kyiv region)
- "Agronomic Research Station" of the NULES of Ukraine (Kyiv region)
- Training and Research Farm "Vorzel" of the NULES of Ukraine (Kyiv region)
- other bases of practical training of university students from among the advanced business structures of agribusiness, trade organizations and exchanges of Ukraine and abroad, which have the proper conditions for conducting students' practice in accordance with the requirements of educational professional programs of training specialists.

### Proposed Topics for Bachelor theses

1. Opening of business in business and its functioning.
2. Business planning of entrepreneurial activity in agribusiness.
3. Business planning of entrepreneurship for processing agricultural products (by type of products).
4. Agrarian Exchange and its activities in Ukraine.
5. Status and prospects of the stock market development.
6. Financial derivatives and their use by stockholders.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Manager of small enterprise by types of economic activity and services; private entrepreneur; Head of the farm and small business in the agrarian sector; director of a trading firm; Sales Representative; sales manager; merchant; specialist in stock trading; broker; dealer; specialist in stock exchange operations; auctioneer (licitator); trading broker (broker), etc.



**Bachelor`s Program and Curriculum in Specialty  
«Entrepreneurship, trade and stock activities»  
Educational-professional program «Entrepreneurship, trade and stock activities»**

Code e / d	Components of the educational and professional program	ECTS credits	Form the final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1.1.1	Political economy	4	exam
CC 1.1.2	History of entrepreneurship development	4	exam
CC 1.1.3	Computer science and computer technology	4	exam
CC 1.1.4	Higher mathematics	7	exam
CC 1.1.5	Microeconomics	4	exam
CC 1.1.6	Economics of Enterprise	4	exam
CC 1.1.7	Probability Theory and Mathematical Statistics	4	exam
CC 1.1.8	Macroeconomics	4	exam
CC 1.1.9	Accounting	4	exam
CC 1.1.10	Finance and Credit	4	exam
CC 1.1.11	Economic and mathematical methods and models	3	exam
CC 1.1.12	Statistics	4	exam
CC 1.1.13	Marketing	4	exam
CC 1.1.14	Management	4	exam
CC 1.1.15	Economic analysis	4	exam
<b>Total</b>		<b>62</b>	
<b>Optional components of EPP</b>			
<i>Optional Block 1 (University Choice)</i>			
OB 1.2.1	History of Ukrainian statehood	3	exam
OB 1.2.2	Safety of work and life	3	exam
OB 1.2.3	Foreign Language	12	exam
OB 1.2.4	Physical Education	4	credit
OB 1.2.5	University education	3	credit
OB 1.2.6	Philosophy	3	exam
OB 1.2.7	Technology of production and processing of crop production	4	exam
OB 1.2.8	Technology of production and processing of livestock products	4	exam
<b>Total</b>		<b>36</b>	
Volume of components of the general training cycle		<b>98</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components of EPP</b>			
CC 2.1.1	Basics of exchange activities	5	exam
CC 2.1.2	Commodity studies	4	exam
CC 2.1.3	Entrepreneurship	5	exam
CC 2.1.4	Business ethics	4	exam
CC 2.1.5	Price and pricing	4	exam
CC 2.1.6	Organization of agribusiness	4	exam
CC 2.1.7	Trade organization	5	exam
CC 2.1.8	Logistics	4	exam
CC 2.1.9	Organization of production	4	exam
CC 2.1.10	E-commerce	4	exam
CC 2.1.11	Cost management	4	exam
CC 2.1.12	Business planning and evaluation of its effectiveness	5	exam
CC 2.1.13	Trading strategies	4	exam
CC 2.1.14	Financial derivatives trading	4	exam
CC 2.1.15	Strategy and business development	4	exam
CC 2.1.16	Potential and business evaluation	5	exam
CC 2.1.17	Cooperation in entrepreneurship	4	exam
CC 2.1.18	Economic assessment of small and medium businesses	4	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

<b>Total</b>		<b>77</b>	
<b>Optional Block</b>			
<i>Optional Block 2 (by choice of students)</i>			
OB 2.2.1	Regional economy	4	
	National economy		
OB 2.2.2	Labor economics and socio-labor relations	5	exam
	Rationing and organization of wages		
OB 2.2.3	Economics of agriculture	5	exam
	Economics of nature management		
OB 2.2.4	Agricultural hedging	6	exam
	Business risks		
OB 2.2.5	Investment	5	exam
	Project analysis		
OB 2.2.6	Brokerage activities	8	exam
	Securities trading		
OB 2.2.7	Taxation of legal entities and individuals	4	exam
	The tax system		
OB 2.2.8	Economics and organization of production services	5	exam
	Economic relations between production and service spheres		
<b>Total</b>		<b>42</b>	
<b>The volume of components of the cycle of special (professional) training</b>		<b>119</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
	Military training	23	
	Educational practice	6	
	Internship	10	
	Preparation of bachelor work (thesis or project)	5	
	State attestation	2	
<b>At the direction of (without military training)</b>		<b>240</b>	

**Annotations of components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Political Economy.** Commodity production and business. Social reproduction and economic growth. Basic social forms of production and their evolution. World economy and global market.

**History of entrepreneurship development.** The main stages of the evolution of entrepreneurial activity; the basis of cultural relations in entrepreneurial activity; essence, content, specifics and types of entrepreneurial activity; the basic laws and regularities of business development.

**Computer science and computer technology.** System maintenance of information processes. Network Technology. The use of the Internet in the economy. Organization of computer security and information security. Basics of WEB design. Software tools for working with structured documents. Software tools for working with databases and repositories. Fundamentals of Office Programming. Utilities. Appointment and application of archival information programs. The basics of protecting your computer from malicious software.

**Higher mathematics.** Elements of linear and vector algebra, analytic geometry. Mathematical analysis: function, boundary, continuity of function, derivative, basic rules of differential equation, functions of one variable and research by its methods of differential numeric function of several variables.

**Microeconomics.** Modern elements of the microeconomic environment and their activities in a socially oriented market economy. Methods and methods of making economic decisions at the microeconomic level in order to survive in the current economic conditions of the functioning of market relations.

**Economics of Enterprise.** Economic mechanism of operation of the enterprise, formation and use of its resource potential with the purpose of optimization of economic results of activity.

**Probability Theory and Mathematical Statistics.** Events, probability, repetition of experiments, laws of probability distribution, numerical characteristics of random variables, systems and functions of random variables, boundary theorems of probability theory, probability of model of economic problems.

**Macroeconomics.** Macroeconomic processes in the conditions of construction and development of market economy of Ukraine. The system of determination, ways of solving the objectives of its achievement. Establishing relationships and defining the order of the relationship between objects and subjects of the macroscopic environment. Solving macroeconomic problems.

**Accounting.** Subject and method of accounting. Balance sheet. Documentation as an element of the accounting method. Account system. Methodology of accounting of basic economic processes. Account accounting plan. Accounting registers and forms of accounting.

**Finance and Credit.** Essence, types and functions of finance of agroindustrial complex. Finances of enterprises, formation and use of profits, working capital, lending to enterprises, financial support, restoration of fixed assets, indicators of financial condition of enterprises and their estimation. Stability of monetary systems and directions of improvement of monetary and credit relations in Ukraine and, in particular, in the agroindustrial complex.

**Economic and mathematical methods and models.** Creation of models of economic systems with the help of various economic and mathematical models and solving optimization problems with the purpose of forecasting the construction and management of modern agricultural enterprises. Methods of nonlinear programming, solution of transport problem, solving of actual economic problems of agricultural production.

**Statistics.** Organization of observation, compilation and analysis of statistical data using the methods of grouping, average variables and indicators of variation, dispersion and correlation calculations, estimation of time and space changes of mass social phenomena.

**Marketing.** The essence, content of marketing and its concept, system and characteristics of modern marketing, as well as marketing policies: commodity, pricing, communications and distribution.

**Management.** Theoretical basis of management, manager in the management system. Motivation and rules of managerial activity. Mechanism of control and responsibility in the management system.

**Economic analysis.** Theoretical, methodological and organizational bases of economic activity analysis of economic entities. Analytical assessment of business processes of an economic entity and their resource support. Financial analysis of economic activity of an economic entity.

## Selective components

### *Sample Block 1 (University of Choice)*

Annotations of disciplines “History of Ukrainian Statehood”, “Labour and Life Safety”, “Foreign Language”, “Physical Training”, “Philosophy”, see Section 2.1.

**University education.** University education in the context of the Bologna process. Fundamentalization and individualization of the training of specialists with higher education. Organization of the educational process at the university. Professional training in higher educational institution: introduction to specialty. Library of the University and the rules for the use of its funds. Socio-cultural infrastructure of the university. Student self-governance as an integral part of the democratization of higher education.

**Technology of production and processing of crop production.** Scientific fundamentals of plant growing. Modern agrotechnologies. Technological maps of growing agricultural crops. The notion of programmable harvesting.

**Technology of production and processing of livestock products.** The current state of the livestock industry. Feed base. Effect of normalized feeding, tribal affairs, methods of keeping animals at the level of their productivity. Production of milk, meat, eggs, wool, etc.

## 2. SPECIAL PREPARATION CYCLE

### Compulsory components

**Basics of exchange activities.** Evolution of wholesale trade forms. History of exchange activity. Organizational and economic principles of commodity exchange activities. Functions of exchange-trade brokers. Types of Exchange Agreements. Rules of exchange trading. Future’s pricing. Stock exchange. Exchange trading in the foreign exchange market.

**Commodity studies.** Requirements for stock commodities and their features, classification of exchange commodities; general characteristics of the agricultural and food products group; peculiarities of international standards for agro-food products; the main fixed assets of futures contracts on the agro food market.

**Entrepreneurship.** Essence of entrepreneurial activity; main types and forms of entrepreneurial activity; the essence of small business; main stages of preparation and registration of constituent documents of small business entities; the essence of an entrepreneurial agreement (contract); main types and types of contracts, their general components and specific features; features of the structure of business contracts and related types of risks; essence of business planning of entrepreneurial activity; main components of the business plan and their general characteristics; essence, features and main forms of financing of entrepreneurship and their characteristics.

**Business ethics.** National and religious peculiarities of labor ethics; the history of ethics, basic concepts, terms and methods of business communication, modern views on the place of ethics in business; professional ethics codes, ethical requirements for the manager.

**Price and pricing.** Theories of pricing, the method of pricing. Limit value of the price, methodological atypical formation of prices in the conditions of inflation, ensuring the equivalence of accounting and prices in the agro-industrial complex.

**Organization of agribusiness.** Entrepreneurship and business in the agrarian sector: the essence, tasks, advantages. Characteristics of business structures. Preparation of business plans.

**Organization of trade.** Theoretical foundations of the trade organization. Organizational models in the trading system. Organizational and economic principles of trade operations. Organizational conditions for the implementation of wholesale and retail trade. Regulation of wholesale and retail trade.

**Logistics.** Perspectives and priorities of development of logistic systems and logistic chains; modern trends in the development of supply and marketing, commercial intermediary organizations subordinated to different levels of management; forms and methods of managing the flows of material resources and their stocks; formation of the infrastructure of the market mechanism of trade in means of production; directions of formation of logistic information systems and their components of information flows; directions of formation of logistic service, its level and quality criteria.

**Organization of production.** Theoretical foundations of production organization; organization of complex production preparation and the process of organizational design and rationalization of production systems; organization of labor processes and standardization of labor; organization of the activities of the main production units and the industrial infrastructure of the enterprise.

**E-commerce.** Basics of e-commerce systems. Business models of e-commerce and their specifics. Organization of payments in e-commerce. Marketing Research and E-Commerce Planning. Current state of e-commerce development.

**Cost management.** The purpose of the discipline is to provide the students with the necessary theoretical foundations, methodological approaches and practical skills regarding the principles, methods and methods of developing and implementing the general strategy and directions of the industrial activity of the industrial enterprise; development and implementation of a modern production system, including the development of production processes, decisions on location of production capacities, enterprise design, product, implementation of standards and standards for the execution of works; planning and control of the current functioning of the production system. To achieve the goal set the following main objectives: the study of production processes in their relationship, formed under the influence of objective economic laws and factors of subjective order; scientific substantiation of decisions on the assessment of business plans with an objective assessment of their implementation.

**Business planning and evaluation of its effectiveness.** The concept of a management system; types of agricultural enterprises and associations; organization of use of land, labor and material resources; social forms of organization of production; planning and economic calculation in agricultural enterprises; organization of branches of plant growing, animal husbandry, industrial production and crafts.

**Trading strategies.** Economic essence and types of trading strategies. Development of trading strategies. Trading strategies in the stock exchange market. Day-Trading: the essence and application features. Scalping strategy. Position trading strategy. Arbitrage strategies.

**Financial derivatives trading.** Derivatives and their classification. Functions of financial derivatives. Stock and OTC financial derivatives. Forwards and their species. Futures for major financial assets. Swaps. Financial engineering. Prospects for the financial derivatives market development.

**Strategy and business development.** General concepts and approaches to the formation of enterprise strategy; basic rules for the formation of enterprise strategies and strategic analysis; criteria for classification of enterprise strategy and justification for choosing a particular strategy; the issue of managing the strategic activity of the enterprise.

**Potential and business evaluation.** Theoretical foundations, patterns, principles and peculiarities of the formation and development of the potential of entrepreneurial structures, theoretical foundations and methodical approaches to the assessment of their

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potential and its individual components, international and national standards for assessing the value of property and property rights, cases of evaluation and implementation of evaluation procedures, modern concepts, preconditions and methodical approaches to the definition of reserves for the development and evaluation of business structures.

**Cooperation in entrepreneurship.** Theoretical and methodological, organizational and economic principles of co-operation; the history of formation, development and regularities of the successive transformations of the cooperative movement in the world and in Ukraine; the essence of cooperative values and principles approved by the International Cooperative Alliance; types of cooperatives; the features of management of agricultural servicing cooperatives, the difference in the management of co-operative groups from the management of other forms of economic activity; objective and subjective needs for the development of cooperation in Ukraine; the basis of the process of creation and liquidation of cooperatives; the basis of state support.

**Economic assessment of small and medium businesses.** The role and importance of small business in a market economy; main organizational forms and types of small and medium-sized businesses in the agrarian sector of the economy; features of the functioning of small and medium-sized business structures in modern conditions; economic and social significance of small business development; criteria and methods for assessing the effectiveness of their activities.

### **Selective components**

#### ***Sample block 2 (by choice of students)***

##### ***Sample block 2.2.1***

**Regional economy.** Scientific fundamentals of the placement of productive forces and organization of farms depending on the natural resource potential and scientific and technological progress. Features of economic development of certain regions of Ukraine.

**National economy.** Theoretical and organizational bases for the regulation of the national economy. Forecasting, programming and macroeconomic planning in the national economy regulation system. Methods of state regulation of the economy.

##### ***Sample block 2.2.2***

**Labor economics and socio-labor relations.** Studying the methodology and methods of analysis of the internal labor market, planning and analysis of the system of labor indicators at the enterprise; acquiring skills in solving practical problems of the labor economy.

**Rationing and organization of wages.** Organization of wages in modern economic conditions. Tariff system of wages. System of remuneration for labor. New approaches to wage organization. Documentary payment for payroll. Procedure for determination and application of average wages. Charges and deductions from salaries of employees. Saving documents on payroll records.

##### ***Sample block 2.2.3***

**Economics of agriculture.** System of production relations in relation to productive forces in agriculture. Ways and methods of rational use of land, material and labor resources, intensification of agricultural production on the basis of scientific and technological progress of specialization, cooperation and integration of agribusiness enterprises, development of commodity-money relations, ways to increase the efficiency of production.

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**Economics of nature management.** Interaction of ecological and economic factors, maintaining the proper quality of the environment, resource conservation. Indicators characterizing ecological, economic and social effectiveness of environmental measures, changes in psychological conditions and socio-hygienic conditions.

#### ***Sample block 2.2.4***

**Agricultural hedging.** Hedging as a method of price risks management. Types of hedging. Long hedging. Short Hedging. Basis and basis risks. Situations of Contango and Backwardation. Organization of hedging by futures and options. Features of hedging prices in the agrarian market.

**Business risk.** Types of risks and methods of managing them: the basic principles of risk analysis. Quantitative and qualitative risk analysis. Basics of risk management. Ways to reduce risk. Economic risks associated with operating activities. Economic risks associated with the investment activity of the enterprise. Economic risks associated with the financial activity of the enterprise.

#### ***Sample block 2.2.5***

**Investment.** Methodological foundations of investment. Forms, objects and directions of investment. Investment Risks. Financial provision of investment. Drafting the budget of the investment project and management of the investment process.

**Project analysis.** Alternatives to implementing market approaches and justifying projects to meet public needs. Studying of modern methods of management of investment projects by subjects of economic activity.

#### ***Sample block 2.2.6***

**Brokerage activities.** Brokers on the stock exchange market. Types of Brokers and Dealers. Organization of brokerage business. Licensing and certification of brokerage houses and brokers. Brokerage services. Foundation of brokerage houses. Legal principles of regulation of brokerage activities in Ukraine.

**Securities trading.** Securities. Securities as an investment object. Debt securities. Equity securities. Regulation of the securities market in Ukraine. NCSSM and its functions. Trading in securities. Stock and over-the-counter securities markets. Features of securities trading on stock exchanges. Listing procedure. IPO and its role in securities trading.

#### ***Sample block 2.2.7***

**Taxation of legal entities and individuals.** Study of the concept, system, principles, mechanism and role of taxation of individuals and legal entities; types of taxes paid by individuals; types of taxation of legal entities; tax conditions.

**The tax system.** Studying of theoretical and organizational bases of taxation, methods of calculations and the order of payment of taxes and obligatory payments of legal entities and individuals.

### ***Sample block 2.2.8***

**Economics and organization of production services.** Scientific fundamentals of organization of the system of production service of agrarian enterprises, its types and forms; the peculiarities of the formation and functioning of relations between agrarian commodity producers and service structures; approaches to business planning and optimization of the functioning system and strategy of development of enterprises of the service sector on the basis of modern methods and techniques (quality management methodology, business process reengineering, information technologies and systems, etc.).

**Economic relations between production and service spheres.** The essence of economic relations and their features in the agro-industrial complex; the features of the formation of marketing tariffs for production services, the equivalence of goods exchange between production and service spheres.



## 2.14. FACULTY OF AGRARIAN MANAGEMENT

**Dean** – PhD in economics, Associate Professor **Anatoliy Ostapchuk**

Voice: (044)527 – 85-73

E-mail: [agromen\\_dean@nubip.edu.ua](mailto:agromen_dean@nubip.edu.ua)

Address: Bldg. 10, room 313,525

The faculty organizes and coordinates the educational process of bachelors in the following specialties:

### **075 Marketing**

Graduating department:

Department of marketing and international trade

Voice: (044)527-89-78

E-mail: [market\\_chair@nubip.edu.ua](mailto:market_chair@nubip.edu.ua)

Acting Department head - Doctor of economic Sciences, Associate Professor Ruslan Buriak

### **073 Management**

Graduating departments:

Department of management named after I.S.Zavadskiy

Voice: (044)527-84-80

E-mail: [kafedra.zavadskogo@i.ua](mailto:kafedra.zavadskogo@i.ua)

Department head - Doctor of economic Sciences, Professor Vasiliy Goryovyi

Department of business administration and foreign international activity

Voice: (044)527-86-51

E-mail: [worldagro\\_chair@nubip.edu.ua](mailto:worldagro_chair@nubip.edu.ua)

Department head - Doctor of economic Sciences, Professor Valeriy Galushko

Department of Production and investment management

Voice: (044)527-80-81

E-mail: [prodinvestman@nubip.edu.ua](mailto:prodinvestman@nubip.edu.ua)

Department head - Doctor of Economic Sciences, Professor, Associate member of the National academy of sciences of Ukraine Lidiia Shynkaruk

**Bachelor**  
**Field of Knowledge "Management and Administration"**  
**in Specialty «MARKETING»**  
**Educational-professional program "Marketing"**

Form of Training:	Licensed number of persons:
– full-time	60 persons
– extramural	60 persons
Duration of Training	4 years
Credits	240 ECTS
Language of Teaching	Ukrainian
Qualification of graduates	Bachelor in Marketing

**The concept of training**

The purpose of training of specialist in "Marketing" is to provide companies and organizations in the sphere of environmental management and agribusiness with highly skilled workers who would be able to operate information about the market situation and can use it to improve effectiveness of both entities and organs of state regulation and control. Qualifications of Bachelor of Marketing allows alumnus to identify the main directions of the market development quickly, to predict trends and develop adaptation measures for them.

**Practical training**

Future marketing experts having an example of real enterprises studies specific features of agricultural production, which will largely determine conduct of such products on the market. As potential leaders they learn to manage the departments of marketing, acquire knowledge of the practical aspects of the market work and understanding of their impact on the development of both the company and the market in general, to determine the place of professional marketer in the administrative and economic system of the state.

**Proposed Topics for Bachelor theses**

1. Promotion strategy development.
2. Marketing product strategy development.
3. Increasing efficiency of agricultural enterprise on the base of marketing research.
4. Marketing activity organization on enterprise.
5. Commercial activity organization of marketing base.
6. Creation communicative enterprise policy on internal (foreign) market.
7. Logistic management.
8. Distribution strategy justification.
9. Marketing management on enterprise.
10. Organization of marketing research activity on the milk and milk-processing market.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog

### **Employment of Graduates**

All graduates are employed in enterprises and organizations of the agricultural sector and public authorities at the following positions: heads of departments of Logistics (Deputy Head of External Cooperation, Deputy Head of Logistics), managers of small enterprises without the apparatus control in commercial service (Deputy of manager of agency: trade, advertising, etc.), economist in pricing, economist in international trade, professional in the sphere of public services and marketing, specialist in the field of marketing, a specialist of department of public relations and media, Head of marketingdepartment, Head of department of public relations and media, manager of a small enterprise without the administrative staff in wholesale and retail trade, manager of public relations, advertising manager.

**Bachelor`s Program and Curriculum  
in Specialty “Marketing”  
Educational-professional program "Marketing"**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	High math	4	exam
CC 2	Bases of economics theory	4	exam
CC 3	Probability theory and math statistic	4	exam
CC 4	Legislative providing of managerial activities	3	exam
CC 5	Statistics	4	exam
CC 6	Psychology of Success	4	exam
CC 7	Management	4	exam
CC 8	Econometrics	3	exam
CC 9	Economy and finance of the Enterprise	4	exam
CC 10	Math programming	4	exam
CC 11	Accounting	4	exam
CC 12	Industrial Marketing (B2B)	4	exam
CC 13	Entrepreneurship Management	3	exam
CC 14	Business foreign language	5	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Economic Informatics	4	exam
OB 1.2	Foreign language	12	exam
OB 1.3	System of technologies: Crop Production	4	exam
OB 1.4	System of technologies: Livestock Production	4	exam
OB 1.5	Information systems in Marketing	4	exam
OB 1.6	Technology of presentations and web-design	4	exam
OB 1.7.	Physical training	4	offset
<b>The volume of components of the general training cycle</b>		<b>90</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 15	Macroeconomics	4	exam
CC 16	Microeconomics	4	exam
CC 17	Marketing	5	exam
CC 17.1	Course paper in Marketing		offset
CC 18	Agricultural Marketing	5	exam
CC 18.1	Course paper in Agricultural Marketing		offset
CC 19	Marketing Pricing	4	exam
CC 20	Logistic	4	exam
CC 21	Human resource management	3	exam
CC 22	World economy and international trade	4	exam
CC 23	Marketing Product Policy	5	exam
CC 23.1	Course paper in Marketing Product Policy		offset
CC 24	Commodity market infrastructure	4	exam
CC 25	Service marketing	4	exam
CC 26	Marketing research	5	exam
CC 26.1	Course paper in Marketing research		offset
CC 27	Bases of Internet Marketing	3	exam
CC 28	Commodity Studing	4	exam
CC 29	Consumer Behavior	4	exam
CC 30	Marketing Pricing Policy	5	exam
CC 30.1	Course paper in Marketing Pricing Policy		offset
CC 31	Marketing Communications	4	exam
CC 32	Risk-Management	3	exam
CC 33	Marketing analyze	3	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

CC 34	Marketing distribution policy	4	exam
CC 35	International Marketing	3	exam
CC 36	Public Relations	3	exam
CC 37	Quality Management of Goods and Services	3	exam
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
<i>2.1. Optional components of common choice</i>			
OB 2.1.1	Introductive to specialty: Bases	3	exam
OB 2.1.2	Introductive to specialty: social communications	5	offset
OB 2.1.3.	Sociology	4	exam
OB 2.1.4.	Philosophy		
OB 2.1.5	Psychology		
OB 2.1.6.	Methodology of social empirical research	4	exam
OB 2.1.7.	Project analysis		
OB 2.1.8.	Economics of world agriculture	4	exam
OB 2.1.9.	Branding		
OB 2.1.10	Business ethics		
<b>Optional Block 2.2 «Marketing of goods and services»</b>			
OB 2.2.1	Marketing in a digital environment	5	exam
OB 2.2.2	Sales management	4	exam
OB 2.2.3	E-commerce	5	exam
OB 2.2.4	Bases of advertising	4	exam
OB 2.2.5	Commercial-intermediary activity	4	exam
OB 2.2.6	Marketing of non-profit organizations	4	exam
<b>Optional Block 2.3 «Internet Marketing»</b>			
OB 2.3.1	Internet communication	5	exam
OB 2.3.2	Internet analytics	4	exam
OB 2.3.3	Marketing of Social Networks	5	exam
OB 2.3.4	Content Marketing	4	exam
OB 2.3.5	E-commerce	4	exam
OB 2.3.6	Speechwriting	4	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>135</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
OB 3.1	Studying practice	3	offset
OB 3.2	Industry practice	8	offset
State attestation		1	
Bachelors qualification thesis (diploma or project)		6	
<b>The amount of optional components (Student's Choice)</b>		<b>60</b>	
<b>The total amount optional components</b>		<b>96</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Higher mathematics.** The purpose of study of discipline is forming for the students of base mathematical knowledge for the decision of tasks in professional activity, abilities of analytical thought and mathematical formulation of economic tasks which arise up in the process of management. The tasks that need to be addressed in the study subjects, students are gaining knowledge of the main sections of higher mathematics, proving basic theorems forming primary skills: perform operations on vectors, matrices, computing determinants, solving systems of linear equations, the study of shapes and properties lines and planes, curves and surfaces of the second order, of the limits of step-exponential functions.

**Bases of economics theory.** The purpose of discipline is achievement of fundamental economic knowledge by future prospective specialists, formation of logic of economic thought and economic culture, teaching them basic methods of cognition and analysis of economic processes, and the ability to make reasonable decisions about economic issues related with their future practical activities.

**Probability theory and mathematical statistics.** The main purpose of teaching is to form future professionals with basic knowledge the basis of a probabilistic-statistical machine to solve theoretical and practical economic problems. The main tasks that needs to be addressed in the process of teaching is to provide students with knowledge of basic definitions, theorems, rules, theorem proving, and the formation of skills: to fulfill qualitative and quantitative mathematical analysis of random events, random variables and systems of values, conduct mathematical treatment of statistical data provide statistical estimation of population parameters.

**Legislative providing of managerial activities.** Purpose of studying of the educational discipline is the necessity to prepare the specialists in the managerial sphere. They will be able to work in conditions of building law-government state and market economy, as well as studying the law norms which regulate public relations. These norms are formed during providing and protecting rights and freedoms as well as interests of physical and juridical persons. The norms are also formed in the process of public administration of economy, social-cultural and administrative-political constructing in the country as well forming the law perception and law culture among the future representatives of business elite, legislative regulating of the economic activities and law based status of the economic subjects and public authorities.

**Statistics.** Teaching of the discipline has an aim of the formation of future professionals of theoretical knowledge and practical skills in statistical estimation of economic phenomena and processes of social life, mastering the methods of the techniques of statistical analysis. The main tasks that need to be resolved in the process of teaching include: gathering, checking and evaluation of statistical information, development of statistical forms, bringing together and grouping of materials of statistical monitoring, identifying relationships between different phenomena and processes, establishing its structure, technics of calculation of generalized statistical indicators and their economic interpretation.

**Psychology of success.** The purpose of the academic discipline lies in studying the objective laws, mechanisms of generation and development of psychological cognitive processes, properties, states and formations and their role in the training of a successful specialist. The task of the discipline is to create a system of theoretical and methodological knowledge on the problems of psychological science and practice, cognition of the

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structural elements of the psyche - the psychological cognitive processes, properties, states and formations at the reproduction and interpretation level for practical application and implementation in the process of a future specialist's professional activity.

**Management.** The main purpose of teaching is to develop in future leaders a modern management thinking and system of special knowledge in branch of management, formation of understanding of the conceptual foundations of organizations' system management, acquirement of skills of analysing internal and external environment, making appropriate management decisions.

**Econometrics.** Purpose of the discipline is to teach students how to quantify the relationship of economic indicators for various sets of economic information going into the last test of the appropriateness of certain prerequisites and to determine methods for quantitative measurement of links that are useful in each case according to the characteristics of economic information.

**Economy and finance of the enterprise.** It is the science of production efficiency, ways and means to achieve the best results at the lowest cost by enterprise. The subject of the study economy and finance of enterprise are methods and ways of combining rational and efficient use of all elements of the manufacturing process at the enterprise level. Target of the economics of enterprise: study measures to improve the efficiency of enterprises and the use of the means of production, and labor intensive study ways and environmentally sound development of enterprises, determination of the effectiveness of introduction of new machines and their systems, individual measures.

**Math programming.** This discipline teaches students to use methods of economic-mathematical models in their professional careers. The main directions of studying of the discipline are the following: mathematical model in the system of material and ideal models, the research of economic processes through mathematico-economic models, the main methods of modeling of economic processes, mathematical formalization of conditions with changable technical and economic factors, economico-mathematical analysis of optimal solutions.

**Accounting.** The main purpose of teaching future marketings is to build theoretical knowledge and acquirement of practical skills in organizing and prosecuting of accounting and leading the auditing of financial statements, as well as using of their results, as the informational base of effective decision-making. The main task of studying the discipline is detailed overall economic and accounting and auditing training of specialists and acquiring of principles, tools, methods and techniques of accounting of commercial enterprises, as well as the audit of the financial statements.

**Industrial marketing.** The purpose of discipline is: the formation of theoretical and practical knowledge about industrial marketing, modern concepts of development, methodological and organizational framework for use. Objectives of the course: the study of the theory of industrial marketing, market research methodology, design and planning of marketing strategies and sales industry, mastering modern management marketing communication activities in the areas of procurement, sales distribution.

**Entrepreneurship management.** This subject provides knowledge about the laws that govern the one hand, the economic property relations between entrepreneurs and employees, on the other - the actions of entrepreneurs in the process of selecting resources for production, exchange, distribution and consumption of goods and services.

**Business foreign language.** The overall objective of the program of foreign language teaching for specific purposes is to develop students' professional language competences that will contribute to their effective functioning in diverse cultural, educational and professional environment.

## Optional components

### *Optional Block 1 (University Choice)*

**Economic informatics.** The formation of future professionals of contemporary information and computer culture, gaining practical skills in modern computer technology and the use of modern information technology to solve various problems in the practice of the specialty.

**Annotations of disciplines “Foreign language” see Section 2.1.**

**System of technology: crop production.** The main purpose of discipline is to provide knowledge to create optimal process (agro-ecological) conditions of the required number of high-quality crop production based on intensive photosynthesis in crops field crops while maintaining or improving soil fertility. The key task of it is: getting practical skills in production high-quality, environmentally friendly products with minimal energy and labor costs while maximizing its output per unit time per unit area that requires large-scale introduction of high-grade, intensive, energy-saving and environmentally appropriate technologies.

**System of technology: livestock production.** Scientific approaches and practical issues of discipline that anticipation for the study have immediate and direct relevance to future research or practice students. This applies both on scientific principles of economics and livestock industries, farms activities, planning and financing their technology of major livestock products, as well as a deep understanding and knowledge of them essentially biological properties of a living organism, patterns of development, the relationship of organism and environment and historical development of the organism. Also state animal that has emerged in Ukraine and introduction of new technologies livestock production requires the ability to assess the effectiveness of a particular technology based initiatives.

**Informational systems in marketing.** The goal of teaching of the discipline is to develop in future professionals a current level of informational and computer culture, the acquirement of practical skills of work on modern computer equipment and the usage of modern information technologies to solve various problems in the practice activity of the specialty.

**Technology of presentations and web-design.** The purpose of teaching is to prepare students for presentations, reports in front of the staff at various levels, training and teaching methods of designing websites in order to bring their ideas to the audience /consumer. The objective of discipline is learning the methods for creating presentations and websites, acquaintance with the basics of building a report.

**Physical training.** Physical education has the goal of strengthening the health and tempering of the body of a young person, promoting physical development and improving work capacity. Specifically, physical education is aimed at the formation, improvement of motor qualities (speed, strength, endurance, flexibility, agility), a steady interest in systematic exercises, instilling hygienic skills.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Macroeconomics.** The purpose of discipline is to train professionals to perform their professional functions, mastering of economic knowledge, which are based on the current macro-analysis, acquisition of skills of aggregate indicators of economic and social development of the national economy research through the use of universal instruments and macroeconomic modeling. As a result of the study of the course students should know: patterns and general trends in development of economic processes at the macro level, allocate part macroeconomic aggregates and the links between them;

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methodological principles of calculation of macroeconomic indicators, forecasting of macroeconomic development and emergence of cycle and indicators of economic cycle;

**Microeconomics.** It is one of the components of modern economic theory – the fundamental science about household which explores human behavior and explains why and how they make certain economic decisions. Microeconomics studies the behavior of individual economic agents in different market structures. The object of study is the behavior of micro-economical entities, ie the process of developing, adopting and implementing decisions regarding the selection and use of scarce resources in order to obtain the greatest possible benefit.

**Marketing.** The purpose of the discipline is the formation in students - future marketers a scientific outlook and special knowledge in the theory, methodology of marketing, development abilities and skills to perform management functions in the enterprise based on marketing for satisfaction of customer's needs and ensure the effective activities of the enterprise.

**Agricultural marketing.** The purpose of discipline is to provide students the theoretical knowledge and practical skills in management, planning and organization of marketing activities of companies in the market of agricultural products. The task is to discipline students acquiring skills in market research of agricultural products (APC), predicting conditions of trade, inventory management and quality of agricultural products, pricing, promotion of goods on the domestic and foreign markets of food, distribution and marketing of domestic products.

**Marketing pricing.** The purpose of the course is to learn the complex knowledge how to develop and implement marketing pricing, pricing on new and traditional products and services. The task of discipline: the study of marketing processes of pricing and skills of analysis, assimilation of pricing principles and marketing management, familiarization with the practical aspects of pricing in the company.

**Logistic.** The primary purpose of teaching of discipline is forming for the future specialists of system knowledge and understanding of conceptual bases of logistic, theory and practice of development of this direction and acquisition of skills of independent work, in relation to mastering of educational material in relation to the modern methods of management financial and other streams in modern terms.

**Human resource management (HR).** The purpose of teaching of discipline is forming of complex of theoretical knowledge and practical skills in relation to forming and realization of skilled policy in modern organizations, rational selection of workers on positions and forming of effective labor collective, evaluation and development of workers, and also the purposeful use of their potential.

**World economy and international trade.** The purpose of teaching course is to form students' understanding of the theories and policies that guide international trade, modern changes in the structure of the world economy and trade, analysis of indicators of their development; Knowledge of forms and methods of organization and regulation of international exchange of goods, services and products of intellectual property, trends and prospects for the development of international trade, Aim: to form a complex of competences for students in planning, organizing and regulating the export / import in the system of international economic relations.

**Marketing product policy.** The purpose of discipline is to learn the principles of comprehensive range of optimization and further development. Solving the above problems of marketing goods policy for future specialists may make the implementation of these tasks discipline involving the study: the quality of goods and services (works), the main market of the goods and services competitive products, the main areas of commercial policy formation.

**Commodity market infrastructure.** The purpose of the following courses: to master the theory of commodity market infrastructure as an essential part of the market

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economy, the practical ability to control its activities to promote, storage and sale of goods and services to meet the needs of consumers, the ability to find and implement solutions for intensification and efficiency in this area. Objectives of the course: to know the nature of the commodity market infrastructure and its role in a market economy, the types and conditions of an effective infrastructure of individual links of the commodity market.

**Services marketing.** The purpose of discipline "services marketing" is to deepen students' knowledge on the specifics of marketing services as a specific commodity and conditions, mechanisms and tools for use in the activities of organizations (companies). Objectives of the course: understanding the significance of marketing in the service sector, its features, market research services, its structure in the world and national levels, regulation and regulatory support, marketing tools absorption features in the organization, and businesses in the service sector, the ability to use this knowledge in practice activity. The object of the course is the theory and practice of marketing in services.

**Marketing research.** The course "Marketing Research" forming students' understanding of marketing research as a science, an introduction to the history of the emergence of marketing and market research, is in the form of systematic data on the direction, organization and most important methods of marketing research in small and medium business. Important objectives of the course "Marketing research" are: developing knowledge about the nature of marketing research, study the importance of marketing research in a market economy, the definition of goals and objectives of marketing research.

**Bases of internet marketing.** The purpose of teaching the academic discipline is to form the future specialists' basis knowledge of modern Internet marketing, gaining competencies in organizing and conducting Internet marketing activities, and evaluation of their effectiveness. In order to achieve the goal, the following tasks are assigned: mastering the basic methods and technologies of products/services promotion on the Internet; effective usage of the most popular Internet marketing technologies.

**Commodity studying.** The purpose of discipline - to give the future specialists theoretical background and practical skills of the fundamental characteristics of the product using knowledge gained in solving the major problems of marketing activities. Problems Subjects: to give the theoretical knowledge of fundamental characteristics that make the use-value of goods; train future professionals to the principles and methods of goods movement; systemating the explore of the multitude of products through the rational application of classification and coding.

**Consumer behavior.** The purpose of discipline is the acquisition of knowledge and practical skills regarding working with customers, managing their behavior, shaping and maintaining consumer demand for their products and services, identifying their customers and influence on the acceptance of their purchase decisions. Objective: To study the functional structure and data base management behavior of consumers. Subject: behavior of potential and actual customers, the factors that affect consumer behavior, models of consumer behavior.

**Marketing communications.** The purpose of discipline: mastering the knowledge of effective goods / services to take effective industrial, institutional and scientific solutions to date. The target of courses: learning the basic categories of marketing communications, exploring techniques budgeting advertising campaigns algorithms calculate the efficiency of advertising appeal to the target audience and practical skills they use in promotion, finding stocks improving the promotion of goods.

**Risk-Management.** The purpose of teaching consists in providing knowledge about the methods of risk assessment parameters that characterize the quantitative relationships between economic variables. Challenges of teaching is learning predictive risk models, acquiring skills to use them in practice economic management. As a result, the study of the course students should know: the nature, subject and object of discipline, modeling of

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economic risk system of economic forecasting risks, the social risk prediction methods of technical analysis.

**Marketing analyze.** The purpose of discipline is to development of students' basic mathematical knowledge to solve problems in professional activities, analytical thinking skills and mathematical formulation of economic problems arising from the management. The tasks that need to be resolved during the process of studding the discipline are: acquation of knowledge of the main sections of higher mathematics, substantiation of basic theorems, formation of primary skills: performance of actions on vectors, matrices, calculations of determinants, solving systems of linear equations, studding of shapes and properties lines and planes, curves and surfaces of the second order, finding of the limits of step-exponential functions.

**Marketing distribution policy.** The purpose of discipline is to teach students the basics of effective distribution of goods and services. In the course of studying the discipline, the theoretical and methodological principles of distribution marketing policy are considered, in particular, regarding the organization and management of commodity trades, wholesale and retail trade in distribution channels, and the organization of work of intermediaries; conceptual basis of understanding marketing policy of distribution and marketing logistics, public procurement and public procurement, choice of marketing policy and distribution channels.

**International marketing.** The purpose of discipline - the formation of students' theoretical and practical knowledge in the sphere of international marketing activities needed to achieve business goals in international business. The object of discipline is a set of principles of integrated management system international marketing activities in the company and implementation of the basic functions of marketing in international business.

**Public relations.** The aim of the course "Public relations" is mastering the basics of PR. The purpose of teaching - the formation of students' theoretical knowledge and practical skills in establishing two-way communication to identify common ideas or common interests and mutual understanding based on truth, knowledge and full awareness.

**Quality management of goods and services.** Purpose of the discipline aims at the formation of a knowledge system of the basic principles, categories, methods and tools of quality management in modern companies, taking into account achievements of theory and practice of quality management; application of these achievements in all aspects of the organization's activity regardless of its branch affiliation, size and structure; providing a glimpse of systematic organization of quality management processes at an enterprise that meets the requirements of international standards. Task: the disclosure of the fundamental theoretical essences of the quality management modern concept; consideration of the assignment and mechanism of the application of classical and modern methods and tools for quality management in the enterprises current activities; obtaining skills for the development and implementation of quality management systems at the enterprise; building skills in the implementation of economic calculations to substantiate organizational and technical decisions for improving quality and productivity, as well as the application of modern methods for quality management of goods and services.

## ***Optional Block 2 (Student's Choice)***

### ***2.1. Optional components of common choice***

**Introductory to specialty.** The purpose of discipline is to familiarize students with the features of future profession, its content and objectives of management, the role of managers at different levels in the management of modern enterprises, especially the training of specialists in management.

**Sociology.** The purpose of the discipline is to familiarize students with the history of sociological thought and problematic field of Ukrainian and world sociology. The following learning assignments are subjected to achieve the purpose: to provide students with a holistic view of society, to form the skills for operating the theoretical and factual material, to help to understand the processes occurring in contemporary society in its various manifestations.

**Annotations of disciplines "Philosophy" see Section 2.1.**

**Methodology of social empirical research.** The students master the methods of scientific cognition of social research, methods and techniques of solving specific social problems independently.

**Project analysis.** The purpose of teaching discipline is to acquire theoretical knowledge and practical skills in conducting marketing, commercial, technical, social, environmental, institutional, financial and economic analysis in the implementation of investment projects. The subject of discipline is the methods of analysis of certain aspects of investment projects. According to this, a marketing specialist should know: a general characteristic of indicators and methods for assessing investment projects; Be able to: analyze investment project in any of its aspects.

**Branding.** The purpose of the discipline is to provide students with theoretical knowledge and practical skills in creating brands, implementing brand strategies in order to maximize the positive impact on the company. Objective: to ensure the formation of competencies in the following areas: understanding the nature and principles of the branding, teaching students to create their own brands, managing their brand assets effectively, developing and maintaining brand strategy. The subject of the discipline are the methods, processes and actions for the company's brand creation.

**Business ethics.** Business ethics as an educational discipline examines the ethical issues of management and business. Questions that are considered during the course: the subject of ethics of business, its importance and basic concepts; basic concepts of business ethics; a combination of ethics and business theory; ethical views on entrepreneurship; ethics of business and human morality; professional ethics and its impact on ethical business issues; Ethics of the relations of the firm and the employee; the essence and structure of the process of business communication; organization of business communication; business events; communicative etiquette; business etiquette as the basis of behavior in the business environment; business image; ethics and social responsibility of business; ethical norms, principles of doing business; corporate culture of organizations; corporate codes of business conduct; ethical code of an entrepreneur; business conflicts and ethical ways of overcoming them; national peculiarities of business ethics; features of the ethics of international business.

### ***Optional Block 2.2 "Marketing of goods and services"***

**Marketing in a digital environment.** This course examines the concept of digital marketing as one of the components of marketing. Particular attention is paid to communication channels specific to the digital environment. Methods of measurement of

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efficiency in various communication channels are analyzed. Separately, the integration of digital marketing in the marketing mix in general and in offline marketing in particular.

**Sales management.** The purpose of teaching discipline is: the acquisition of theoretical knowledge and practical skills from the basics of the process of analysis, planning, organization and control of sales. The tasks of studying the discipline are: assimilation of scientific and theoretical issues of distribution in market conditions; study of theoretical and practical issues of formation, design and functioning of distribution channels; providing future specialists-marketers with knowledge on the issues of researching the effective functioning of distribution channels; provision of the necessary knowledge on the choice and work with intermediaries, management of the activities of participants in the commodity movement; Students gain methodological and methodological skills in choosing and conducting distribution policies in conditions of competition and market conditions.

**E-commerce.** The purpose of teaching the discipline is to: form higher knowledge theoretical knowledge and practical skills for the implementation of business transactions and transactions with the use of electronic information processing tools and the World Wide Web to ensure greater effectiveness of future entrepreneurial and professional activities. The tasks of studying the discipline are: systematization and expansion of knowledge about the structure and tools of work with information on the Internet; study of the main categories and forms of sales activity in the information and communication environment of the Internet; Identification of ways to improve the business activities of enterprises through the use of opportunities for doing business on the Internet; systematization of knowledge about electronic financial transactions in the Internet, determining the effectiveness of introducing elements of e-commerce in the activities of enterprises (organizations); systematization and introduction of Internet marketing and Internet advertising in entrepreneurship. Subject discipline - methodology and methods of construction, analysis of e-commerce systems and business technologies based on the use of information and communication capabilities of the Internet.

**Bases of advertising.** The purpose of the discipline is to inculcate among students a system of theoretical knowledge and practical skills in the organization and management of advertising activities at enterprises. The discipline's task consists in assimilation of the main components of the organization of advertising activity, understanding of the principles of advertising effectiveness, the choice of the media of advertising, the areas of creativity in advertising; principles and methodical approaches to generating new ideas in advertising; evaluation of advertising effectiveness.

**Commercial-intermediary activity.** The discipline studies modern approaches to the possibility of commercial management of intermediary enterprises in order to transfer to modern technologies, strategies, purchase and sale tactics; the use and application of modern forms, methods of commercial transactions for the effective operation of business intermediary companies.

**Marketing of non-profit organizations.** The objectives of mastering the discipline are: to provide a systematic, deep and comprehensive study of the theoretical and methodological foundations of marketing and to promote the acquisition of skills in the development and adoption of managerial decisions in the field of marketing formation of non-profit organizations. Non-commercial marketing is an activity used to create, maintain or change the attitudes and relationships of target audiences to certain organizations and their professional activities. This type of marketing is related to the activities of non-profit organizations that aim to achieve a certain social effect by public institutions, health care facilities, social security, culture, charitable organizations, mercy services, denominational institutions, churches, sects and , finally, political parties and movements.

**Optional Block 2.3 «Internet Marketing»**

**Internet communication.** The purpose of the discipline is to familiarize students with the complex of marketing communications on the Internet. The complex of marketing communications on the Internet, as well as traditional communications, consists of the following elements: advertising, sales promotion, direct marketing and public relations. The use of the Internet provides the specific features of these elements of the communication complex. In addition to these tools, the course deals with such special tools of Internet communications as search marketing (SEM), search engine optimization - SEO, SMM - work with social networks, Email - marketing, blogging etc

**Internet analytics.** The purpose of teaching discipline is to create knowledge and skills for students to use web analytics tools to optimize web resources. Internet analytics: statistics, trends, absolute and relative indicators; analysis of site attendance, usability analysis, analysis of the behavior of visitors on a page, determining the conversion paths of site visitors; benchmarking - comparing with general trends and with competitors through independent researchers (Alexa, GemiusAudience, Google Trends).

**Marketing of Social Networks.** The purpose of teaching this discipline is to promote the formation of students of modern marketing thinking, acquisition of competences that will allow actively and creatively to participate in the development and practical application of modern tools for promoting business through social networks. Marketing Methods in Social Networks: Creating Brand Communities; work with the blogosphere; reputation management; personal branding; Social Media Optimization (SMO); non-standard SMM-promotion; promotion strategies in social networks; assessment and analysis of the effectiveness of work in social networks

**Content Marketing.** The purpose of the discipline is to teach students to attract attention and attract the target audience to the media product by creating and disseminating relevant valuable information and content related marketing content, mastering content marketing skills, managing activities in social media. Objectives and principles of content marketing, its advantages and risks, work with various social media platforms and communication channels, content marketing automation, custody, aggregation and content syndication, content marketing tactics and strategies, site content auditing and content audit marketing company

**E-commerce.** The purpose of teaching discipline is to develop competencies in the implementation of business transactions and transactions using electronic media. Online stores the notion of online store; the process of making a purchase; advantages and disadvantages; corporate sites main and additional features. providing services. trading venues the idea of a trading floor. business model; types of trading platforms; exchange; auction; catalog.

**Speechwriting.** The purpose of the study of the discipline "Spicwrighting" is the acquisition of knowledge and practical skills in writing texts and speeches, the circumstances of their proclamation, the students of the place of spigration in the system of preparation of a specialist in advertising and public relations, definition of the role of public speeches in the process of forming the marketing positions of the subject social communications; acquaintance with the history of the formation and development of science of rhetoric and oratory; study of the laws of public broadcasting; familiarization with the main means of persuasion and verbal influence on the audience, with the main means of implementing non-verbal influence on the audience, with the composition of speech, with the specifics of the preparation of various types of speeches in the circumstances of the speech, the specifics of the preparation of various types of speeches on their psychological motives; with the specifics of the preparation of various types of speeches in the sphere and the target direction; analysis of public speeches.

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**Bachelor  
field of knowledge "Management and Administration"  
in Specialty "MANAGEMENT"  
Educational-professional program "Management"**

Form of training:	licensed number of persons:
- full-time	150 persons
- extramural	60 persons
Term of training	4 years
Credits ECTS	240
Language of instruction	Ukrainian, English
Qualification of graduates	Bachelor in management, manager administrator

**Concept of training**

The purpose of training as "Management" is to provide agribusiness companies and organizations highly skilled workers primary level management departments, operating systems and processes. Qualifications Bachelor of Management and Manager administrator can graduate quickly adapt to domestic economic relations of enterprises and organizations to quickly develop and implement the elements of the management system, establish an effective incentive system.

**Practical training**

Future management specialists of specific companies gain working knowledge of modern management methods, knowledge of the technological issues of enterprise's ability to govern themselves, to build a clear personal goals, ability to solve problems, the ability to innovate, and the ability to influence others, knowledge of modern management approaches, the ability to control, the ability to train and develop subordinates; manage enterprise knowledge of the practical aspects of decision-making.

**Proposed Topics for Bachelor theses**

1. System of human resource potential management improvement.
2. Improvement of system of working achievements and personal skills rates of managers.
3. Management of business activity of enterprises and ways of their improvement.
4. Improvement of organization and motivation of staff on enterprise.
5. Improvement of management system in livestock business.
6. Development communication system in the structure of management of enterprise.
7. Increasing efficiency of making management decision and their implementation.
8. Creating competitive strategy of enterprise.
9. Creating system of quality management in agrarian enterprises.
10. Human resource management in cooperatives.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

All graduates are employed in companies and organizations in the agricultural sector and public authorities at the following positions: managers of production units in commercial service, working apparatus of central government, workers, staff of local authorities, heads of other departments in other areas (Inspector, Deputy Chief department), managers of small enterprises without the apparatus (Vice Chairman), managers of business and management (personnel manager, manager of administration), managers in other sectors of economic activity, economists (economist contract work, Economic Advisory) assistant managers.



**Bachelor's Program and Curriculum  
in Specialty «Management»  
Educational-professional program "Management"**

<b>Code n/a</b>	<b>Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)</b>	<b>Amount of credits ECTS</b>	<b>The final control</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	High math for managers	4	exam
CC 2	Bases of economics theory	4	exam
CC 3	Probability theory and math statistic	4	exam
CC 4	Legislative providing of managerial activities	3	exam
CC 5	Statistics	4	exam
CC 6	Finance, money and credit	4	exam
CC 7	Marketing	4	exam
CC 8	Econometrics	3	exam
CC 9	Economy and finance of the Enterprise	4	exam
CC 10	Math programming	4	exam
CC 11	Accounting	4	exam
CC 12	Entrepreneurship Management	3	exam
CC 13	Financial and economic safety		
CC 14	Business foreign language	5	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Economic Informatics	4	exam
OB 1.2	Foreign language	12	exam
OB 1.3	System of technologies: Crop Production	4	exam
OB 1.4	System of technologies: Livestock Production	4	exam
OB 1.5	Information systems in Marketing	4	exam
OB 1.6	Business protocol and negotiation	4	exam
OB 1.7.	Physical training	4	offset
<b>The volume of components of the general training cycle</b>		<b>90</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 15	Macroeconomics	4	exam
CC 16	Microeconomics	4	exam
CC 17	Theory of organization	4	exam
CC 18	Business ethics	4	exam
CC 19	Management	5	exam
CC.19.1	Course paper in Management		offset
CC 20	Selfmanagement	4	exam
CC 21	International economic relations	5	exam
CC.21.1	Course paper in International economic relations		offset
CC 22	Logistic	4	exam
CC 23	Operational management	5	exam
CC.23.1	Course paper in Operational management		offset
CC 24	Business analysis	4	exam
CC 25	Management of team interactions.	3	exam
CC 26	Economics of world agriculture	3	exam
CC 27	Human resource management (HR)	4	exam
CC 28	Controlling	4	exam
CC 29	Foreign economic activity of enterprise	5	exam
CC 29.1	Course paper in Foreign economic activity of enterprise		offset
CC 30	Communication management	3	exam
CC 31	Risk-management	3	exam
CC 32	Strategic management	5	exam
CC 32.1	Course paper in Strategic management		offset

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

CC 33	Project management	3	exam
CC 34	Theory of leadership	4	exam
CC 35	Methods of making managerial decisions	3	exam
CC 36	Management of innovations	3	exam
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
<i>2.1. Optional components of common choice</i>			
OB 2.1.1	Introductory to specialty: Bases	3	exam
OB 2.1.2	Introductory to specialty: social communications	5	offset
OB 2.1.3	Sociology	4	exam
OB 2.1.4	Philosophy		
OB 2.1.5	Technology of presentations and web-design	4	exam
OB 2.1.6	Methodology of social empirical research		
OB 2.1.7	Bases of scientific research		
OB 2.1.8	International economic integration. Eurointegration	4	exam
OB 2.1.9	State and regional management		
OB 2.1.10	<b>Конфліктологія та психологія ділового спілкування</b>		
<b>Optional Block 2.2 «Management of investment activity and international projects»</b>			
OB 2.2.1	Investment analysis.	5	exam
OB 2.2.2	International economic statistics	4	exam
OB 2.2.3	Management of production systems	5	exam
OB 2.2.4	Crisis management	4	exam
OB 2.2.5	Social management	4	exam
OB 2.2.6	Asset management and investment portfolio	4	exam
<b>Optional Block 2.3 «Management organization and business administration»</b>			
OB 2.3.1	Basics of cooperation	5	exam
OB 2.3.2	Marketing Management	4	exam
OB 2.3.3	Management of agro-industrial enterprise	5	exam
OB 2.3.4	Commercial law	4	exam
OB 2.3.5	Accounting and analytical support of management activity	4	exam
OB 2.3.6	Management of motivation	4	exam
<b>Optional Block 2.4 «Management of foreign activity»</b>			
OB 2.2.1	International organizations	5	exam
OB 2.2.2	Marketing in foreign international activity	4	exam
OB 2.2.3	International transportation	5	exam
OB 2.2.4	Customs regulation of foreign economic operations	4	exam
OB 2.2.5	Foreign commercial activity	4	exam
OB 2.2.6	Operations management of exports and imports	4	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>135</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
OB 3.1	Studying practice	3	offset
OB 3.2	Industry practice	8	offset
State attestation		1	
Bachelors qualification thesis (diploma or project)		6	
<b>The amount of optional components (Student's Choice)</b>		<b>60</b>	
<b>The total amount optional components</b>		<b>96</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Higher mathematics.** The purpose of study of discipline is forming for the students of base mathematical knowledge for the decision of tasks in professional activity, abilities of analytical thought and mathematical formulation of economic tasks which arise up in the process of management. The tasks that need to be addressed in the study subjects, students are gaining knowledge of the main sections of higher mathematics, proving basic theorems forming primary skills: perform operations on vectors, matrices, computing determinants, solving systems of linear equations, the study of shapes and properties lines and planes, curves and surfaces of the second order, of the limits of step-exponential functions.

**Bases of economics theory.** The purpose of discipline is achievement of fundamental economic knowledge by future prospective specialists, formation of logic of economic thought and economic culture, teaching them basic methods of cognition and analysis of economic processes, and the ability to make reasonable decisions about economic issues related with their future practical activities.

**Probability theory and mathematical statistics.** The main purpose of teaching is to form future professionals with basic knowledge the basis of a probabilistic-statistical machine to solve theoretical and practical economic problems. The main tasks that needs to be addressed in the process of teaching is to provide students with knowledge of basic definitions, theorems, rules, theorem proving, and the formation of skills: to fulfill qualitative and quantitative mathematical analysis of random events, random variables and systems of values, conduct mathematical treatment of statistical data provide statistical estimation of population parameters.

**Legislative providing of managerial activities.** Purpose of studying of the educational discipline is the necessity to prepare the specialists in the managerial sphere. They will be able to work in conditions of building law-government state and market economy, as well as studying the law norms which regulate public relations. These norms are formed during providing and protecting rights and freedoms as well as interests of physical and juridical persons. The norms are also formed in the process of public administration of economy, social-cultural and administrative-political constructing in the country as well forming the law perception and law culture among the future representatives of business elite, legislative regulating of the economic activities and law based status of the economic subjects and public authorities.

**Statistics.** Teaching of the discipline has an aim of the formation of future professionals of theoretical knowledge and practical skills in statistical estimation of economic phenomena and processes of social life, mastering the methods of the techniques of statistical analysis. The main tasks that need to be resolved in the process of teaching include: gathering, checking and evaluation of statistical information, development of statistical forms, bringing together and grouping of materials of statistical monitoring, identifying relationships between different phenomena and processes, establishing its structure, technics of calculation of generalized statistical indicators and their economic interpretation.

**Finance, money and credit.** The aim of the course is to develop in the future specialists in marketing a modern economic thought and knowledge system concerning general normflities of development of modern financial and monetary relations of society. The purpose of discipline is to develop in students of modern economic thinking and

system of specific knowledge about basic concepts regarding the economic and financial activity, contents of its specific

**Marketing.** The purpose of the discipline is the formation in students - future marketers a scientific outlook and special knowledge in the theory, methodology of marketing, development abilities and skills to perform management functions in the enterprise based on marketing for satisfaction of customer's needs and ensure the effective activities of the enterprise.

**Econometrics.** Purpose of the discipline is to teach students how to quantify the relationship of economic indicators for various sets of economic information going into the last test of the appropriateness of certain prerequisites and to determine methods for quantitative measurement of links that are useful in each case according to the characteristics of economic information.

**Economy and finance of the enterprise.** It is the science of production efficiency, ways and means to achieve the best results at the lowest cost by enterprise. The subject of the study economy and finance of enterprise are methods and ways of combining rational and efficient use of all elements of the manufacturing process at the enterprise level. Target of the economics of enterprise: study measures to improve the efficiency of enterprises and the use of the means of production, and labor intensive study ways and environmentally sound development of enterprises, determination of the effectiveness of introduction of new machines and their systems, individual measures.

**Math programming.** This discipline teaches students to use methods of economic-mathematical models in their professional careers. The main directions of studying of the discipline are the following: mathematical model in the system of material and ideal models, the research of economic processes through mathematico-economic models, the main methods of modeling of economic processes, mathematical formalization of conditions with changable technical and economic factors, economico-mathematical analysis of optimal solutions.

**Accounting.** The main purpose of teaching future marketings is to build theoretical knowledge and acquirement of practical skills in organizing and prosecuting of accounting and leading the auditing of financial statements, as well as using of their results, as the informational base of effective decision-making. The main task of studying the discipline is detailed overall economic and accounting and auditing training of specialists and acquiring of principles, tools, methods and techniques of accounting of commercial enterprises, as well as the audit of the financial statements.

**Entrepreneurship management.** This subject provides knowledge about the laws that govern the one hand, the economic property relations between entrepreneurs and employees, on the other - the actions of entrepreneurs in the process of selecting resources for production, exchange, distribution and consumption of goods and services.

**Financial and economic safety.** Purpose of studying of the educational discipline is possessing knowledge concerning creation a modern complex system of financial and economic safety of enterprises of different forms of property as well as effective managerial mechanism of financial and economic safety, possessing the theoretical and practical bases of organization the complex system of safety of an enterprise as a bases for avoiding the threats and risks of their activities, providing the financial and economic safety of enterprises , understanding of current threats and risks of enterprises' activities, choosing of appropriate means and tasks to avoid threats and risks at enterprises, estimation of different market and professional situations for working out and implementing the most optimal decisions.

**Business foreign language.** The overall objective of the program of foreign language teaching for specific purposes is to develop students' professional language competences that will contribute to their effective functioning in diverse cultural, educational and professional environment.

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## Optional components

### *Optional Block 1 (University Choice)*

**Economic informatics.** The formation of future professionals of contemporary information and computer culture, gaining practical skills in modern computer technology and the use of modern information technology to solve various problems in the practice of the specialty.

**Annotations of disciplines “Foreign language”** see Section 2.1.

**System of technology: crop production.** The main purpose of discipline is to provide knowledge to create optimal process (agro-ecological) conditions of the required number of high-quality crop production based on intensive photosynthesis in crops field crops while maintaining or improving soil fertility. The key task of it is: getting practical skills in production high-quality, environmentally friendly products with minimal energy and labor costs while maximizing its output per unit time per unit area that requires large-scale introduction of high-grade, intensive, energy-saving and environmentally appropriate technologies.

**System of technology: livestock production.** Scientific approaches and practical issues of discipline that anticipation for the study have immediate and direct relevance to future research or practice students. This applies both on scientific principles of economics and livestock industries, farms activities, planning and financing their technology of major livestock products, as well as a deep understanding and knowledge of them essentially biological properties of a living organism, patterns of development, the relationship of organism and environment and historical development of the organism. Also state animal that has emerged in Ukraine and introduction of new technologies livestock production requires the ability to assess the effectiveness of a particular technology based initiatives.

**Informational systems in marketing.** The goal of teaching of the discipline is to develop in future professionals a current level of informational and computer culture, the acquirement of practical skills of work on modern computer equipment and the usage of modern information technologies to solve various problems in the practice activity of the specialty.

**Business protocol and negotiation.** The discipline examines modern requirements for management, in particular in such areas, business protocol and ethics, as an important component of it, enterprise responsibility - the first step towards ethical behavior, preparation for negotiations, negotiation (main stages and their characteristics), negotiation methods, styles Negotiation, analysis of negotiation results and implementation of agreements reached, rules and regulations for conducting business meetings, main points of agreement on a business meeting, preparation of premises and meeting delegate her.

**Physical training.** Physical education has the goal of strengthening the health and tempering of the body of a young person, promoting physical development and improving work capacity. Specifically, physical education is aimed at the formation, improvement of motor qualities (speed, strength, endurance, flexibility, agility), a steady interest in systematic exercises, instilling hygienic skills.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Macroeconomics.** The purpose of discipline is to train professionals to perform their professional functions, mastering of economic knowledge, which are based on the

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current macro-analysis, acquisition of skills of aggregate indicators of economic and social development of the national economy research through the use of universal instruments and macroeconomic modeling. As a result of the study of the course students should know: patterns and general trends in development of economic processes at the macro level, allocate part macroeconomic aggregates and the links between them; methodological principles of calculation of macroeconomic indicators, forecasting of macroeconomic development and emergence of cycle and indicators of economic cycle;

**Microeconomics.** It is one of the components of modern economic theory – the fundamental science about household which explores human behavior and explains why and how they make certain economic decisions. Microeconomics studies the behavior of individual economic agents in different market structures. The object of study is the behavior of micro-economical entities, ie the process of developing, adopting and implementing decisions regarding the selection and use of scarce resources in order to obtain the greatest possible benefit.

**Theory of organization.** The primary objective of teaching of discipline is forming modern, on the basis of approach of the systems, to the world view in relation to creation, functioning and evolution of organizations. Main tasks which must be the disciplines decided in the process of teaching is: providing of students knowledge is about a theory and practice of functioning of organizations in the changeable terms of modern market socio-economic environment, about adjusting of processes, which in them take place in relationship with an external environment and others like that.

**Business ethics.** Business ethics as an educational discipline examines the ethical issues of management and business. Questions that are considered during the course: the subject of ethics of business, its importance and basic concepts; basic concepts of business ethics; a combination of ethics and business theory; ethical views on entrepreneurship; ethics of business and human morality; professional ethics and its impact on ethical business issues; Ethics of the relations of the firm and the employee; the essence and structure of the process of business communication; organization of business communication; business events; communicative etiquette; business etiquette as the basis of behavior in the business environment; business image; ethics and social responsibility of business; ethical norms, principles of doing business; corporate culture of organizations; corporate codes of business conduct; ethical code of an entrepreneur; business conflicts and ethical ways of overcoming them; national peculiarities of business ethics; features of the ethics of international business.

**Management.** The main purpose of teaching is to develop in future leaders a modern management thinking and system of special knowledge in branch of management, formation of understanding of the conceptual foundations of organizations' system management, acquirement of skills of analyzing internal and external environment, making appropriate management decisions.

**Selfmanagement.** The purpose of study of discipline is a capture theoretical knowledge and practical skills on questions personality development of manager; forming for the students of individual features and behavioral skills which need a future leader; development for the future managers of abilities to organize the personal labor.

**Logistic.** The primary purpose of teaching of discipline is forming for the future specialists of system knowledge and understanding of conceptual bases of logistic, theory and practice of development of this direction and acquisition of skills of independent work, in relation to mastering of educational material in relation to the modern methods of management financial and other streams in modern terms.

**Operating management.** The primary objective of teaching of discipline is forming for the students of competence in relation to base principles, basic categories, modern conceptions, theoretical positions and practical methods of management of enterprises and abilities of development of operating strategy, creation and use of a particular branch

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operating subsystems basic activity, as basis of providing of achievement of mission of organization.

**Management of team interactions.** Purpose of studying of the educational discipline is possessing the skills of forming of effective teams as one of the perspective models of corporative management that can provide effective organizational development, studying the essence and peculiarities of forming the managerial team, complex and constructive using of team effects, opening and development of students' opportunities during team work, explaining the reasons for positive team synergy.

**Economics of world agriculture.** The main goal of mastery of the course is a deep study of patterns of world agricultural equip future professionals systematized and generalized knowledge about agricultural economics of individual countries and regions in the context of global trends in agricultural production and international relations

**Human resource management (HR).** The purpose of teaching of discipline is forming of complex of theoretical knowledge and practical skills in relation to forming and realization of skilled policy in modern organizations, rational selection of workers on positions and forming of effective labor collective, evaluation and development of workers, and also the purposeful use of their potential.

**Controlling.** Discipline implies that the purpose of the enterprise, the current collection and processing of information for management decision making, executing control deviation evidence from the plan and, most importantly, prepare recommendations for management decisions. Controlling aimed at improving the management and efficiency of economic management at the micro level.

**Foreign economic activity of enterprise.** The purpose of discipline is a receipt of system knowledge students from objective conformities to law, terms, processes and specific features of foreign economic activity (FEA) of enterprise, and also acquisition of skills, them the practical use. The result of study of discipline is forming for the students of integral imagination about processes in the field of FEA; capture of modern economic thought a culture, by methodological approaches in relation to an analysis and estimation of efficiency of foreign economic activity; forming for the students of abilities and practical skills of the use of the purchased knowledge is in practice of realization of foreign economic activity of enterprises in relation to application of empiric.

**Communication management.** The purpose of teaching discipline is to form a system of special knowledge on the problems and perspectives of development of interpersonal, intergroup, mass and marketing communications of different types of organizational entities for fundamental and special education and practical activity in the specialty. The result of studying the discipline is: mastering of techniques, methods, procedures, technologies that provide effective information and emotional interaction between different levels of groups and individuals representing the organization and its environment; the ability of the applicant to establish and maintain the optimally favorable communication processes for the organization, to form and develop a positive image and public opinion, to ensure an atmosphere of consent, cooperation and recognition.

**Risk-Management.** The purpose of teaching consists in providing knowledge about the methods of risk assessment parameters that characterize the quantitative relationships between economic variables. Challenges of teaching is learning predictive risk models, acquiring skills to use them in practice economic management. As a result, the study of the course students should know: the nature, subject and object of discipline, modeling of economic risk system of economic forecasting risks, the social risk prediction methods of technical analysis.

**Strategic management.** The primary objective of teaching of discipline is a capture of strategic management modern theoretical bases and by practical skills of acceptance of strategic decisions in the process of management activity and development of enterprise at the market. Basic tasks which must be the disciplines decided in the process of teaching

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is theoretical preparation of students and forming for them of skills in the field of strategic management an enterprise.

**Entrepreneurship management.** This subject provides knowledge about the laws that govern the one hand, the economic property relations between entrepreneurs and employees, on the other - the actions of entrepreneurs in the process of selecting resources for production, exchange, distribution and consumption of goods and services.

**Project management.** The main aim of the discipline is to form appropriate practical skills in application of universal instruments of project design and implementation in order to achieve effective functioning and development of an organization. The objective of the discipline is to provide students with scientific and methodological basis to master the main tools of project management in an organization.

**Theory of leadership.** The purpose of teaching discipline is to form a system of special knowledge on the problems and perspectives of development of interpersonal, intergroup, mass and marketing communications of different types of organizational entities for fundamental and special education and practical activity in the specialty. The result of studying the discipline is: student's learning of techniques, methods, procedures, technologies that provide effective informational and emotional interaction between different levels of groups and individuals representing the organization and its environment; the ability of the applicant to establish and maintain the optimally favorable communication processes for the organization, to form and develop a positive image and public opinion, to ensure an atmosphere of consent, cooperation and recognition.

**Methods of making managerial decisions.** The aim of the discipline is to give basic knowledge to students in the theory of methods for making managerial decisions on the basis of system analysis, mathematical modeling and optimization of business entities in a market economy and their applications; processing them on concrete, as close as possible to real, model case studies, examples and mathematical models of methods for determining optimal managerial decisions, using computer facilities, application software packages, modern information technologies, etc.

**Management of innovations.** The primary objective of teaching of discipline is a capture modern theoretical bases and practical skills of management of organization innovative activity. Basic tasks which must be the disciplines decided in the process of teaching is theoretical preparation of students and forming for them of skills in the field of management of organization innovative activity. The result of study of discipline is acquisition of the special professional jurisdictions from management innovations.

### ***Optional Block 2 (Student's Choice)***

#### ***2.1. Optional components of common choice***

**Introductory to specialty.** The purpose of discipline is to familiarize students with the features of future profession, its content and objectives of management, the role of managers at different levels in the management of modern enterprises, especially the training of specialists in management.

**Sociology.** The purpose of the discipline is to familiarize students with the history of sociological thought and problematic field of Ukrainian and world sociology. The following learning assignments are subjected to achieve the purpose: to provide students with a holistic view of society, to form the skills for operating the theoretical and factual material, to help to understand the processes occurring in contemporary society in its various manifestations.

**Annotations of disciplines "Philosophy" see Section 2.1.**



**Technology of presentations and web-design.** The purpose of teaching is to prepare students for presentations, reports in front of the staff at various levels, training and teaching methods of designing websites in order to bring their ideas to the audience /consumer. The objective of discipline is learning the methods for creating presentations and websites, acquaintance with the basics of building a report.

**Methodology of social empirical research.** The students master the methods of scientific cognition of social research, methods and techniques of solving specific social problems independently.

**Bases of scientific research.** The main purpose of teaching is to form future professionals with basic knowledge the basis of a probabilistic-statistical machine to solve theoretical and practical economic problems. The main tasks that needs to be addressed in the process of teaching is to provide students with knowledge of basic definitions, theorems, rules, theorem proving, and the formation of skills: to fulfill qualitative and quantitative mathematical analysis of random events, random variables and systems of values, conduct mathematical treatment of statistical data provide statistical estimation of population parameters.

**International economic integration. Eurointegration.** The aim of teaching the discipline - to provide students with modern knowledge of international integration processes and European integration that will allow to form new model of training specialists in management, who will be able to make correct decisions in conditions of European integration of Ukraine. Students will examine: the nature, preconditions and goals of international economic integration; consequences and economic effects of the integration process; regional integration stages and its description; features of forming integration groups in different parts of the world; evolution and characteristics of creating the European Union and mechanism of its regulation; causes and consequences of establishment and reforming the Common Agricultural Policy of the EU etc.

**State and regional administration.** A purpose of course is forming of knowledge in industry of management on national and regional levels; acquisition of abilities and forming of jurisdictions, necessary for implementation functions and realization of plenary powers of public and local self-government authorities.

### ***Optional Block 2.2 «Management of investment activity and international projects»***

**Investment analysis.** The purpose of studying discipline is a set of methods and techniques that can be used to develop an effective investment strategy and make investment decisions, to substantiate the feasibility of implementing an investment project and to determine the optimal parameters of its implementation in conditions of uncertainty and limited financial resources, to form an optimal investment portfolio.

**International economic statistics.** The purpose of the study of discipline is to reveal the content of the main phenomena and processes occurring in the economy, to develop a system of economic indicators and methods of studying the economy of a country or region, characterizing social phenomena as massive, based on the account of the totality of factors that determine them, characterize the degree of development of phenomena, the direction and speed of their changes, the density of interconnections and interdependencies, mastering not only theoretical knowledge, but also practical skills in the collection, processing, summing up and analysis of statistical material, the acquisition of future experts in knowledge and the ability to conduct research on the socio-economic state of the state, based on objective information of international economic statistics.

**Management of production systems.** The purpose of the study of discipline is to study the totality of processes or actions that cause the combination of elements, parts in the whole, the formation of the viability of a stable system, internal ordering, interaction of

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relatively independent parts of the whole, due to its structure; definition of ways to combine the resources of land, labor, capital (material means of production) and their coherent, purposeful use.

**Crisis management.** The purpose of studying the discipline is to determine the essence, trends, methods of crisis management; state regulation of crisis situations; study of the possibilities and necessity of crisis management; key factors of crisis management; study of development trends and practical possibilities of crisis management, its functions and directions; the features of the use of basic organization management tools, the study of the impact of various factors on ensuring the effectiveness of the management system.

**Social management.** The purpose of studying the discipline is to get systematic knowledge about the objective laws of the functioning of the system of social management, as well as the acquisition of skills for their practical use; the assimilation of the content of the basic concepts, categories and terms of social management, the study of the essence of the basic laws, laws and functions of social management; definition of its principles, disclosure of methods, forms and mechanisms of management of various social phenomena and processes in modern society at macro and micro levels.

**Asset management and investment portfolio.** The purpose of studying the discipline is to provide students with theoretical and methodological knowledge and practical skills in asset management and portfolio investment, analysis of the investment market, selection and analysis of investment instruments. They will be able to solve specific tasks of asset management of enterprises and to carry out effective management of investment portfolio of enterprises.

### ***Optional Block 2.3.***

**Basics of cooperation.** The goal of study course is to explain the basics of formation cooperative identity to a student, understanding of how the cooperative works and its place in modern society. Study the origins of cooperation and influence cooperative identity in the task manager. Grounded cooperatives values and its principles. Analyzes the advantages of cooperatives over other forms of management based on consideration of current trends in global and local socio-economic systems.

**Marketing Management.** The discipline studies the system of administrative relations in marketing departments and their relationship with other business units. The aim is the formation of the modern approaches to understanding marketing management abilities to achieve the transition to a new level and forms of consumption by situational market analysis, forecasting the evolution of consumer needs and strategic planning of stimulating goods and services movement, sales, providing increased entrepreneurial resistance on the domestic market. The main tasks of discipline are to provide competences in basic opportunities of marketing management for broad entrepreneurial activity in various organizations and environments.

**Management of agro-industrial enterprise.** The goal of teaching "Management in agriculture" is to provide students with a comprehensive system of knowledge and skills to manage business processes in agricultural production systems, conditions for effectiveness of economic structures, diagnosis and management system design, adequate to the purposes and objectives of the market economy. Give students the theoretical knowledge and practical skills they study and justify specific proposals concerning topical issues of management in the agricultural sector, production in the agricultural enterprises, creating effective collective and individual farming, development of cadastre and land management.

**Commercial law.** The purpose of discipline is forming for the students of the system of legal knowledge, integral associated with administrative activity; mastering of theoretical knowledge and practical skills, associated with the legal adjusting of economic activity, legal status of subjective manage and public authorities.

**Accounting and analytical support of management activity.** The study discipline involves the study of theoretical and practical aspects of the use of accounting and analytical activity in substantiating, accepting and implementing managerial decisions. In the study of discipline, the future specialist gets knowledge of the methodology of collecting and analyzing information on a comprehensive assessment of the results of management, justification and determination of internal reserves of rational use of material, financial and labor resources.

**Management of motivation.** The purpose of the discipline - to extend and deepen knowledge of basic theory and practice of management motivation, gain practical skills and motivation skills of different categories of management stuff. The subject of discipline "motivational management" is to determine motivation place in the socio-psychological structure of personality, motivational content of the process, the use of motivational theories in management practices; mastering different methods of motivation of different categories of workers, motivated management teams and groups.

#### ***Optional Block 2.4. "Management of foreign activity"***

**International organizations.** The aim of the discipline is to provide students with comprehensive and systematic knowledge about the activities and influence of international organizations on the practice of doing business in a globalized world. The key tasks of the course include: to familiarize students with the preconditions for the emergence of international organizations in the world; to find out the essence, functions and types of international organizations; to substantiate the influence of international organizations on the results of the work of business entities at micro, meso- and macro levels; consider the current trends in the development of international organizations in the face of new challenges and threats to the global economy.

**Marketing in foreign international activity.** The purpose of discipline - the formation of students' theoretical and practical knowledge in the sphere of international marketing activities needed to achieve business goals in international business. The object of discipline is a set of principles of integrated management system international marketing activities in the company and implementation of the basic functions of marketing in international business.

**International transportation.** The aim of the discipline is the formation of systemic theoretical knowledge and acquiring practical skills in the organization of international freight traffic. The main tasks of studying the discipline are to show to future specialists that a rational organization of international transportation provides for intensive use of rolling stock, timely delivery of goods from country to country, optimizes transportation costs when exporting and importing goods; student study of international legal acts, acts of bilateral agreements and norms of internal legislation, which establish the procedure for regulating transport activities in international traffic; acquaintance of students with the list and forms of transport document circulation for foreign economic operations; analysis and substantiation of the competencies of state licensing and certification authorities.

**Customs regulation of foreign economic operations.** The aim of the discipline is to provide students with knowledge on customs matters necessary future specialists to manage in the field of foreign trade. As a result of studying the discipline the student must know: the theoretical and organizational principles of customs; procedure for moving goods across borders Ukraine procedure of calculation and collection of tax payments that occur when moving goods across borders Ukraine; the order of customs clearance of

goods; responsibility for violation of customs rules. be able: to carry out customs clearance of goods; to accrue taxes and fees arising from the movement of goods across the customs border of Ukraine; to calculate the amount of penalties for violation of customs rules; to resolve the discussion issues regarding customs legislation, to critically criticize it and to develop proposals for its improvement.

**Foreign commercial activity.** The students will study the methods and techniques of the trade policies of various countries, international pricing methods, technique and organization of various foreign commercial transactions. During the training course the following questions: commercial transactions in the system of foreign economic relations; features concluding international commercial transactions; functional provision of foreign business enterprise.

**Operations management of exports and imports.** The main tasks to be solved in the discipline is: to learn how to develop and use management models for the effective functioning of foreign trade enterprises in foreign markets; mastering the principles and methods of organizing management, planning and control over the implementation of export-import operations; acquiring skills in assessing the performance of export-import operations; assurance quality results of export-import operations; acquiring knowledge about the types, stages of implementation and features of realization of foreign trade operations of foreign economic activity of Ukraine; learning the basic principles of the settlement of foreign currency in Ukraine.

## 2.15. FACULTY OF INFORMATION TECHNOLOGY

**Dean** – Ds.Sc. in Pedagogics, associate professor **Olena Glazunova**

Tel.: 044 527-83-51 E-mail: o-glazunova@nubip.edu.ua

Location: Educational building 15, room 212

The faculty organizes and coordinates Bachelor training in the following specialties:

### **051 Economy**

Educational-professional Program «**Economic Cybernetics**»

Graduating departments:

Economic Cybernetics Tel.: (044) 5278724

E-mail: ciber\_chair@nubip.edu.ua

Head of department – Ds.Sc. in Economics, professor, Andrii Skrypnyk

Information systems Tel.: (044) 527-86-07

E-mail: systems\_chair@nubip.edu.ua

Head of the department – Ph.D. in Economics, professor, Mykhailo Shvydenko

Educational-professional Program "**Digital Economy**"

Graduating department:

Economic Cybernetics Tel.: (044) 5278724

E-mail: ciber\_chair@nubip.edu.ua

Head of department – Ds.Sc. in Economics, professor, Andrii Skrypnyk

Information systems Tel.: (044) 527-86-07

E-mail: systems\_chair@nubip.edu.ua

Head of the department – Ph.D. in Economics, professor, Mykhailo Shvydenko

### **122 Computer science**

Educational-professional Program «**Computer science**»

Graduating department:

Computer Sciences Тел.: (044) 527-87- 23

E-mail: iusprog@nubip.edu.ua

Head of the department – Ph.D. in Information Technologies, associate professor  
Bella Golub

### **121 Engineering software**

Educational-professional Program «**Software Engineering**»

Graduating department:

Computer Sciences Тел.: (044) 527-87- 23

E-mail: iusprog@nubip.edu.ua

Head of the department – Ph.D. in Information Technologies, associate professor  
Bella Golub

**123 Computer engineering**

Educational-professional Program «**Computer engineering**»

Graduating department:

Computer Systems and Networks Тел.: (044) 527-81- 99

E-mail: [csn@it.nubip.edu.ua](mailto:csn@it.nubip.edu.ua)

Head of the department – Ds.Sc. in Engineering, professor Valerii. Lakhno

**125 Cybersecurity**

Educational-professional Program «**Cybersecurity**»

Graduating department:

Computer Systems and Networks Тел.: (044) 527-81- 99

E-mail: [csn@it.nubip.edu.ua](mailto:csn@it.nubip.edu.ua)

Head of the department – Ds.Sc. in Engineering, professor Valerii. Lakhno

**Bachelor's  
Field of Knowledge «Social and behavioral sciences»  
in specialty "ECONOMY"  
Educational-professional program "Economic cybernetics"**

Form of Training:	Licensed number of persons:
– Full-time	25
– Part-time	-
Duration of Training	4 years
Credits	240 ECTS
Language of Teaching	Ukrainian, English
Qualification	Bachelor of Economic Cybernetics

**Concept of training**

Educational program "Economic Cybernetics" is a unique combination of computer and economic disciplines, which operates in various fields. The concept of training aimed at forming professionals which are fluent in information technology, management skills the workforce and entrepreneurial activity.

**Practical training**

Practical training of students of this field of study is aimed at mastering basic methods and techniques of economic-mathematical modeling and forecasting of social and economic processes using information systems and technologies in management

**Proposed Topics for Bachelor theses**

1. Models situational diagnosis of the financial condition agricultural enterprises.
2. Optimization of production resources potential.
3. Production functions in optimization problems.
4. The model of banks, leasing companies and stock exchanges.
5. Economic-mathematical modeling of foreign exchange reserves.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

Graduates of the «Economic Cybernetics» can work: the head of a small business, the head of the analytical center of processing economic, financial and accounting information, the head of IT, computer network administrator, administrative tasks and systems, database administrator, analyst of computer systems and so on.

**Bachelor's Program and Curriculum  
in Specialty "Economy"  
Educational-professional "Economic cybernetics"**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC1.	Modern economic theory	6	exam
CC2.	Macroeconomics	4	exam
CC3.	Microeconomics	4	exam
CC4.	Higher Mathematics	8	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1.	Philosophy	4	exam
OB 1.2.	History of Ukrainian statehood	4	exam
OB 1.3.	Business protocol and communication ethics	4	exam
OB 1.4.	Physical education		
OB 1.5.	Foreign language	8	exam
OB 1.6.	Safety of activity and life	4	exam
OB 1.7.	Technology of crop production	8	exam
OB 1.8.	Legal culture of personality	4	exam
OB 1.9.	Technology production of livestock products	4	exam
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC5.	Probability Theory and Mathematical Statistics	6	exam
CC6.	Optimization Methods and Models	5	exam
CC7.	Informatics	6	exam
CC8.	Econometrics	5	exam
CC9.	Enterprise Economics	4	exam
CC10.	Management	4	exam
CC11.	Marketing	4	exam
CC12.	Finances	4	exam
CC13.	Money and credit	4	exam
CC14.	Accounting	4	exam
CC15.	Economy	4	exam
CC16.	International Economics	4	exam
CC17.	Agribusiness organization	4	exam
CC18.	Statistics	4	exam
CC19.	Economic Cybernetics	4	exam
CC20.	Operations Research	8	exam
CC21.	Modeling economy	5	exam
CC22.	Prediction of socio-economic processes	5	exam
CC23.	Decision-making systems	4	exam
CC24.	Technology design and administration of DB and SD	6	exam
CC25.	Information systems and technology management	6	exam
CC26.	Project Management Informatization	4	exam
<b>The volume of components of the general training cycle</b>		<b>144</b>	
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1. «Business analytics»</b>			
OB 2.1.	Technology of software developing	8	exam
OB 2.2.	Digital economy	4	exam
OB 2.3.	WEB programming	8	exam
OB 2.4.	System analysis and design of IS	4	exam
OB 2.5.	Science of risk	4	exam
OB 2.6.	Mathematical models of agricultural sector	4	exam



**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.7.	IBM SPSS Tools	4	exam
OB 2.8.	Analysis with R	4	exam
OB 2.9.	Applied econometrics	4	exam
OB 2.10.	Simulation	4	exam
OB 2.11.	Technology of software developing	4	exam
<b>Optional Block 2.2 «Business process modeling»</b>			
OB 2.1.	Technology of software developing	8	exam
OB 2.2.	Digital economy	4	exam
OB 2.3.	WEB programming	8	exam
OB 2.4.	System analysis and design of IS	4	exam
OB 2.5.	Science of risk	4	exam
OB 2.6.	Mathematical models of agricultural sector	4	exam
OB 2.7.	IBM SPSS Tools	4	exam
OB 2.8.	Modeling with R	4	exam
OB 2.9.	Mathematical economics	4	exam
OB 2.10.	Adaptive models in economics	4	exam
OB 2.11.	Modeling of investment processes	4	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>96</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
<b>Military training course</b>		<b>29</b>	
<b>Academic Practice</b>		<b>18</b>	
<b>Bachelor Thesis writing (Graduate thesis or Project)</b>		<b>8</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Modern economic theory** Buyers and consumer goods. Social production resources. Commodity production - the basis of the market economy. Money in the functioning of the market. Market economic mechanism Levels types of markets and market infrastructure. Formation of the market Entrepreneurship. Home improvement in the functioning of a market economy. Enterprise Management. Management. Marketing Macroeconomic equilibrium. Macroeconomic instability

**Macroeconomics.** Theoretical foundations of macroeconomics as a science. The method of calculation of basic macroeconomic indicators. Macroeconomic instability, unemployment and inflation. Aggregate demand and aggregate offering. Consumption, savings and investment, the total expenditure and GDP, economic functions of the state: the state in a system of macroeconomic regulation. Fiscal Policy. Money Market and Monetary Policy. Labor market and social policy. The open model of macroeconomic circulation and economic growth.

**Microeconomics.** Methodological principles of microeconomic analysis of economic behavior of market participants. Universal tools of rational economic decisions. Patterns of functioning microsystems individuals, households, businesses and organizations. Characterization and analysis of the major types of market structures - perfect competition, pure monopoly, monopolistic competition, oligopoly. Effect of general market equilibrium in the allocated efficiency of the economy, the limited failure of market regulation, welfare criteria, the need for intervention

**Higher mathematics.** Sets and functions: operations with sets, display sets, limitations, accurate numerical limits set, the principle of Cantor nested segments are equivalent sets, counted and countless sets. Theory border sequences, limit functions, partial, upper and lower limit function. Continuity of functions: local properties of continuous functions, properties of continuous functions on the interval. Differential calculus of functions of one variable: derivatives and differentials of arbitrary order, au-tic properties of differentiable functions, Taylor's formula and studies on extreme and graphing functions. Indefinite integral: primitive and indefinite integral, their properties change of variables and integration by parts, Tables of integrals, methods of integration: rational functions

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of the disciplines: "Philosophy", "History of Ukrainian statehood", "Ethnic culture science", "Ukrainian language (for professional purposes)", "Physical Education", "Foreign language", "Technology of crop production", "Technology of livestock production" see. section 2.1.

**Public communications.** Research Methodology Social Communications. Theory and history of social communications. Social and communication technology. Social Communication in management.

**Legal culture of personality.** Basics of theory of law. Principles of Constitutional Law. Principles of justice and policing in Ukraine. Basics of administrative, financial and criminal law. Basics of civil, family, commercial, labor, environmental, agricultural, natural-resource and land rights.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

**Probability Theory and Mathematical Statistics.** Basic concepts. Classification of random events. Probability of random events. Classical, Statistical and geometrical definition of probability. Almost reliable and virtually impossible event. Numerical characteristics of random variable the expected value, variance, standard deviation, moments, kurtosis, mode, median. Laws normal probability distribution, performance, uniform, Puasson. Correlation coefficient. Chebyshev inequality. Grouping information. The principle of defining and testing the null hypothesis. Criteria for approval to test the hypotheses.

**Optimization Methods and Models.** Conceptual aspects of mathematical modeling of the economy. Optimization of economic-mathematical models. Linear programming problems and methods of solution. The theory of duality. Integer programming. Special problems of linear programming. Models of nonlinear programming. Quantitative risk assessment. Mathematical methods for solving linear programming problems, the scope of their applications, advantages and disadvantages. Basic mathematical methods for solving problems of nonlinear programming advantages and disadvantages; mathematical tools build econometric models.

**Informatics.** Object, methods and objectives of discipline, the theoretical foundations of computer science, information system support processes, software tools work with structured documents, network technology, the use of Internet in the economy, Essentials of Web-design, organization of computer security and information protection

software works with databases and storage of data, basic office programming expertise and training systems, the prospects for the development of information technology.

**Econometrics.** Principles of constructing econometric models. Multiple regression models. Generalized econometric models. Econometric models of dynamics. Mathematical building of econometric models. Method of constructing econometric models. Methods of calculating the parameters of models on personal computers using software packages.

**Enterprise Economics.** Types of companies and their legal forms. Theories and models of enterprise and entrepreneurship basics. The external environment of the enterprise. Staff enterprise productivity. Remuneration of personnel: basic forms and systems. Technological base of production and production capacity. Fixed and working capital: estimation and performance of fixed assets and how they play, composition and turnover of working capital performance. Intellectual capital and its characteristics. Investments: concept, composition, structure, development of investment projects. Forecasting and planning of the company. Justification of the production program of the enterprise. Financial and economic performance and efficiency. Systems to ensure competitiveness.

**Management.** Organization as an object of management, the nature and characteristics of the management, the development of ideas about management. Principles and methods of management. Internal and external environment of the organization: Communication in management and decision-making. Planning organization: Organizational structure. The motivation of the employees of the organization, system and process control in the organization. Formation and development of staff, management and leadership. The efficiency of the management of the organization.

**Marketing.** The essence of marketing and its modern concept. System and characteristics of modern marketing. Marketing Research. Marketing product policy. Planning for new products. Marketing pricing. Methods for marketing pricing. Marketing communications policy. Complex marketing communications. Marketing policy distribution. Managing channels of distribution. Organization and control of the marketing of the company.

**Finance.** The subject of financial science. Financial category. The genesis and evolution of finance. Finance and financial policies. Taxes and tax system. Budget. The budget system. Insurance. The insurance market. Financial Market. Finance businesses. International finance. Financial Management.

**Money and Credit.** Purpose and function of money, Money and cash flows, money market, money system, inflation and monetary reforms, foreign exchange market and currency system. Mechanism of the money supply and monetary policy, the role of money in a market economy; theory of money, credit essence and function, form, type and role of credit; Theoretical Foundations percent; Financial intermediation money market; Theoretical basis of commercial banks, central banks in the system monetary and banking management, international financial institutions and their cooperation with Ukraine..

**Accounting.** Overview of accounting, its subject and method. Balance. Accounts bookkeeping and double entry. Evaluation and calculation. Documentation, inventory, equipment and forms of accounting. Accounting for fixed assets. Accounting for inventories. Accounting for cash and receivables. Accounting of financial investments. Accounting for equity. Accounting for liabilities. Accounting for labor and its remuneration and social security staff. Expenditure of the company. Revenue and financial results. Financial Statements.

**Economy.** Types of companies and their legal forms. Theories and models of enterprise and entrepreneurship basics. The external environment of the enterprise. Staff enterprise productivity. Remuneration of personnel: basic forms and systems. Technological base of production and production capacity. Fixed and working capital: estimation and performance of fixed assets and how they play, composition and turnover

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of working capital performance. Intellectual capital and its characteristics. Investments: concept, composition, structure, development of investment projects. Forecasting and planning of the company. Justification of the production program of the enterprise. Financial and economic performance and efficiency. Systems to ensure competitiveness.

**International Economics.** International Economic System: subjects and objects of international economics. International economic activity: the theory of international trade and international economic activity. The world market for goods services: types, current trends, pricing in international trade. Global financial markets: financial resources, species. Global labor market and international labor migration. The world monetary system: the nature, structure, stages of development, especially the foreign exchange market. Globalization of economic development: the nature, characteristics, consequences, contradictory, role of international organizations in addressing global world problems. Ukraine's integration into the world economy.

**Agribusiness organization.** Theoretical Foundations of production. Analyze of agro-processes. Technical and economic indicators rational organization of production systems. Selection and justification of the production structure of the enterprise. Specialization of production. Organizational, technical, and economic elements of production.

**Statistics.** methodological principles of statistics, statistical observations, reports and statistical clustering data summarizing statistical indicators, analysis of the distribution of numbers, concentration analysis, differentiation and similarity distributions, sampling method, statistical methods for measuring relationships, analysis of the intensity dynamics, analysis of trends and fluctuations; index method, presenting statistical data: tables, graphs, maps.

**Economic Cybernetics.** Terms of cybernetics. Introduction to applied mathematics. Introduction to information theory. Systems theory. Management of production systems. Methods of Economic Cybernetics.

**Operations Research.** Essence phases of operations research, principles and methods of mathematical modeling operations, principles of selection and mathematical software for practical implementation problems. Queuing models. Models of management. Models of human behavior. Models of risk management.

**Modeling economy.** Methodology and methods of modeling. Mathematical models of real economic systems. Conceptual Foundations of Economic Modeling. Algorithmic models in economics. Production functions. Rated assessment of the economy. Model behavior of producers and consumers. Input-output model. Macroeconomic models.

**Prediction of social and economic processes.** Theoretical basis of forecasting of socio-economic systems and algorithms for basic forecasting methods modern transformation processes. Mathematical modeling as a method of forecasting. Extrapolation prediction. Adaptive forecasting methods. Expert prediction.

**Decision-making systems.** The main principles of decision theory. The process of making and implementing management decisions. Expert methods and decision-making. Methods and systems of decision making under certainty. Methods and systems of decision making under risk. The utility theory at decision making. The methods and decision-making in conflict.

**Technology of design and administration of DB and SB.** Relational data model that accommodates relational algebra and relational calculus. The classic approach to database design based on the principles of normalization. Top features of the approaches to semantic modeling of databases, the issues of planning, development, implementation and maintenance of databases, introduction to structured query language SQL, data types used in SQL, means the definition of database objects, data manipulation, data retrieval tools. Utilities databases and applications to databases in integrated development

environments Access. Features of the databases to MySQL. The principles of expert systems, neural networks, principles of knowledge bases.

**Information systems and technologies of management.** The essence of information systems and their importance in managing of modern enterprises. Status and trends in information technology. Methodology for developing information systems to determine their quality and efficiency. Fundamentals management of information resources and technology. Formation of structure information in the enterprise. The use of integrated automated information systems in business. Determination of the main characteristics of expert systems. The use of artificial intelligence technology in the management of organizations. Using the Internet in management cadres. The use of e-commerce in practice organization.

**Project management information.** The theoretical basis of project management. Classification and environment projects. The life cycle of the project. Using standard life cycles. information systems. The structure of the project. Managing the implementation of project-oriented activity. Activity organization. Planning in UP. Control in project management. Management of the project. Management subject area projects. Managing time in the project. Cost Management. Quality management of the project. Integrated project management functions. Automation functions of project management.

### **Optional components**

#### ***Optional Block 2 (Student's Choice)***

##### ***Optional Block 2.1. "Business analytics "***

**Technology of software developing.** Basic concepts of modern programming. Linear, structural, procedural and modular programming. Basics of object-oriented modeling, design and programming. Processing complex data structures and files Design of a graphical user interface. The main stages of the life cycle of software.

**Digital economy** The notion of a digital economy. The main goals of digital development. Accelerated scenario of digital development. Digitalization as the basis for the creation of the cyber-physics space and the digital transformation of the economy. Principles of digitalization. Directions of digital development. Development of digital competencies. Introduction of the concept of digital jobs. Digitalization of the real sector of the economy. Industry 4.0. Realization of projects of digital transformations. Cybersecurity and public safety. Digital education. Electronic Governance and Electronic Democracy. Harmonization with European and world scientific initiatives. Industry 4.0. Realization of projects of digital transformations. Cybersecurity and public safety. Digital education. Electronic Governance and Electronic Democracy. Harmonization with European and world scientific initiatives.

**WEB programming.** The basic structure of language, layout techniques and communication with other development tools WEB-pages. Using of Cascade Style Sheets CSS in HTML. Description Syntax CSS, accommodation options describing CSS in the document body and beyond, CSS attributes for block and lowercase markup. Methods for positioning of the markup with CSS. Basics of programming in JavaScript. Logic development JavaScript-code and the basic principles of its use in the pages of World Wide Web programming language PHP. Client-server technology as the main area of application of the PHP language.

**System analysis and design of integrated circuits.** Information technology and systems: general characteristics. System analysis Structural and functional analysis of IS. The specification of functional requirements for ICs. Simulation data streams. Object-oriented analysis. Standard of IS design and execution of project documentation. Tools of IS design. Model of databases. Standard UML: static and dynamic charts.

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**Science of risk.** Quantitative methods of risk assessment. The function of personal utility. Quantitative risk assessment characteristics. Playing methods of decision making under uncertainty. Solving conflicts using game techniques. The fundamental relationship of risk and return. Fundamental value risk and profitability of individual financial market instruments. Tools IBM SPSS.

**Mathematical models of agricultural sector.** Subject, content, tasks and structure of the course. Classification Features models modeling of technological processes in animal husbandry. Features of construction of models of technological processes of crop. Theory and practice of economic-mathematical analysis in agricultural production planning and evaluation of its effectiveness in market conditions. Agricultural enterprise as an object of modeling.

**IBM SPSS Tools.** Overview of statistical packages. Data management in IBM SPSS. Graphical capabilities package, creating charts. Formation of descriptive statistics and frequency analysis. Contingency tables and chi-squared test. Comparison medium dependent and independent samples and non-parametric tests in SPSS. Univariate and multivariate analysis of variance. Carrying factor and discriminant analysis software package. Reliability analysis of economic data and logistic regression. Analysis of contingency tables

**Analysis with R.** Introduction to R. Analysis tools. Basics of R programming. Data structures in R. Reading and writing data. Working with R libraries and packages. Descriptive analytics. Statistical Analysis in R: mean, median, mode, range, variance and standard deviation, quantities. Graphical description of the data. Simple Linear Regression. Multiple Linear regression. Logistic regression.

**Applied econometrics.** Basic principle of construction econometric models. Econometric models of agricultural production. Spatial simultaneously models. Elasticity evaluation of production process individual inputs. Dynamic models for a particular farm. Multikoliniarity in agricultural business analyze. The time series analysis (price dynamics of global markets). Econometric models of supply and demand. Panel regression. Forecasting using ARIMA \* ARIMAS.

**Simulation.** Simulation model. Simulation model experimental method for the study of complex systems on the computer. The basic steps of building a simulation model - Application of Monte-Carlo method. Computer simulation of random events, and discrete random variables. Planning of experiments in simulation modelling. Multi-factor correlation-regression analysis. Simulation model of reserves control. Simulation model of discrete-production process. Implementation of a simulation model by means of batch simulation of discrete systems GPSS World and AnyLogic. Advances and prospective development of simulation modeling of agricultural production systems.

**Agribusiness Risks.** Analys, methods of quantitative valuation and risk modeling of agricultural sector. Fundamentals of risk management activities of modern agribusiness. Conceptual approaches to manage risk and minimize them - diversification, insurance, hedging, obtain additional information. Risk management strategies for farms. Development of agricultural policy for minimizing risks.

### ***Optional Block 2.2" Business process modeling "***

**Technology of software developing** Basic concepts of modern programming. Linear, structural, procedural and modular programming. Basics of object-oriented modeling, design and programming. Processing complex data structures and files Design of a graphical user interface. The main stages of the life cycle of software.

**Digital economy** The notion of a digital economy. The main goals of digital development. Accelerated scenario of digital development. Digitalization as the basis for the creation of the cyber-physics space and the digital transformation of the economy.

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Principles of digitalization. Directions of digital development. Development of digital competencies. Introduction of the concept of digital jobs. Digitalization of the real sector of the economy. Industry 4.0. Realization of projects of digital transformations. Cybersecurity and public safety. Digital education. Electronic Governance and Electronic Democracy. Harmonization with European and world scientific initiatives. Industry 4.0. Realization of projects of digital transformations. Cybersecurity and public safety. Digital education. Electronic Governance and Electronic Democracy. Harmonization with European and world scientific initiatives.

**WEB programming.** The basic structure of language, layout techniques and communication with other development tools WEB-pages. Using of Cascade Style Sheets CSS in HTML. Description Syntax CSS, accommodation options describing CSS in the document body and beyond, CSS attributes for block and lowercase markup. Methods for positioning of the markup with CSS. Basics of programming in JavaScript. Logic development JavaScript-code and the basic principles of its use in the pages of World Wide Web programming language PHP. Client-server technology as the main area of application of the PHP language.

**System analysis and design of integrated circuits.** Information technology and systems: general characteristics. System analysis Structural and functional analysis of IS. The specification of functional requirements for ICs. Simulation data streams. Object-oriented analysis. Standard of IS design and execution of project documentation. Tools of IS design. Model of databases. Standard UML: static and dynamic charts.

**Science of risk.** Quantitative methods of risk assessment. The function of personal utility. Quantitative risk assessment characteristics. Playing methods of decision making under uncertainty. Solving conflicts using game techniques. The fundamental relationship of risk and return. Fundamental value risk and profitability of individual financial market instruments. Tools IBM SPSS.

**IBM SPSS Tools.** Overview of statistical packages. Data management in IBM SPSS. Graphical capabilities package, creating charts. Formation of descriptive statistics and frequency analysis. Contingency tables and chi-squared test. Comparison medium dependent and independent samples and non-parametric tests in SPSS. Univariate and multivariate analysis of variance. Carrying factor and discriminant analysis software package. Reliability analysis of economic data and logistic regression. Lohliniynny analysis of contingency tables

**Modeling with R.** Introduction to R. Objects, packages, functions and devices. Data types in R. Time series. Organization of computations, functions, branches, loops. Computing in R using apply-functions. The basic graphics capabilities in R. Descriptive statistics and distribution laws. Selection of the law and the distribution parameters in R. Test for normality of distribution. Classical statistical models. Analysis of variance. Generalized regression model. The modeling of structural equations.

**Mathematical Economics.** The partial derivatives economic content. Optimization problems in the presence and absence of restrictions. The Lagrange multipliers method o its economic interpretation. Kuhn-Tucker conditions. The firmn eoclassical theory. Comparative firm statistics. Imperfect competition (monopoly, monopsony). The equilibrium theory. The welfare economy. Social optimum concept.

**Adaptive models in economics.** The concept of adaptation in the economy. The principles of adaptive modeling. Classification of adaptive models. Cybernetic concept of study. Adaptive correlation coefficient. Autoregression methods of analysis the main trends in the time series. Autocorrelation analysis method.

Stages of creating of the adaptive predictive model. Methods of automatic control the short-term forecasting. Method of Chow. Model of Chow. Selection of prognosis criteria. Comparative analysis of Chow models and exponential average models. The principle of Trigg Method adaptation. The method of monitoring the model adequacy (Trigg Method). Trigg-Lich Model. Holt-Winters Model. Tamara Method. Adaptive filtering method.

**Modeling of investment processes.** Innovation concept. Innovation and investment. Innovation and risk. The fundamental relationship between profitability and risk in applications to innovation. Adoption criteria of innovative solutions in risk terms. Risk tolerance and acceptance of innovative solutions. Relative effectiveness of innovation estimates.



**Bachelor**  
**Field of Knowledge «Social and behavioral sciences»**  
**in specialty "ECONOMY"**  
**Educational program "Digital Economy"**

Form of Training:	Licensed number of persons:
– Full-time	25
– Part-time	–
Duration of Training	4 years
Credits	240 ECTS
Language of Teaching	Ukrainian
Qualification	Bachelor of Economics

**Concept of training**

The educational program "Digital Economy" aims at forming a highly skilled specialist capable of solving complex and non-standard tasks and problems in the field of digital economy.

The program is focused on obtaining advanced theoretical knowledge and practical skills for students for the effective implementation of activities in the field of digital transformation of existing and new economy sectors, digital transformation of life spheres and the construction of an open information society.

**Practical training**

Practical training of students of this educational program is aimed at mastering the basic methods and techniques of digital information technology, computer modeling and forecasting of socio-economic processes, that will enable them to apply modern mathematical methods, models and information technologies in the digital transformation of the economy.

**Proposed Topics for Bachelor theses**

1. Development of digitization of agrarian production and rural infrastructure.
2. Designing Smart Agricultural Systems.
3. Application of blockchain technology in agriculture.
4. Modeling and forecasting of crop yields using the technologies of remote sensing.
5. Digital modeling of the enterprise production potential.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

The development of the digital economy is a priority for Ukraine, and graduates of the Digital Economy Education Program will be able to work in many areas of the national economy, in government and commercial structures in positions related to the digitization of the economy and society. They will also be able to work in the typical positions of manager in the field of providing information, information analyst, system analyst, information technology manager, information manager, communications technology manager, computer communications analyst, consolidated information analyst, computer system analyst.

**Bachelor's Program and Curriculum  
in Specialty "Economy"  
Educational-professional program "Digital Economy"**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Modern economic theory	8	exam
CC 2	Macroeconomics	4	exam
CC 3	Microeconomics	5	exam
CC 4	Higher mathematics	9	exam
CC 5	Informatics	6	exam
CC 6	Economic and financial analysis	4	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	Philosophy	4	exam
OB 1.2	History of Ukrainian statehood	4	exam
OB 1.3	Business protocol and communication ethics	4	exam
OB 1.4	Physical Training		
OB 1.5	Foreign language	8	exam
OB 1.6	Modern information communications	5	exam
OB 1.7	Production, processing and storage technology of agricultural products	8	exam
OB 1.8	Legal Personal Culture	4	exam
<b>The volume of components of the general training cycle</b>		<b>73</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 7	Probability theory	5	exam
CC 8	Optimization methods and models	4	exam
CC 9	Econometrics	4	exam
CC 10	Management	4	exam
CC 11	Marketing	4	exam
CC 12	Finances	4	exam
CC 13	Mathematical Statistics	6	exam
CC 14	Accounting	4	exam
CC 15	Cloud Computing Technologies	4	exam
CC 16	Psychology of success	4	exam
CC 17	Processing and analysis of spatial data	5	exam
CC 18	Internet of Things	5	exam
CC 19	Digital economy	4	exam
CC 20	Operations Research	4	exam
CC 21	Modeling the economy	5	exam
CC 22	Digital Infrastructure	4	exam
CC 23	Decision making systems	4	exam
CC 24	Technology of design and administration of DB and SD	6	exam
CC 25	Information systems	6	exam
CC 26	IT project management	4	exam
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1</b>			
OB 2.1	Technology of creating software products	6	exam
OB 2.2	Technologies of artificial intelligence	5	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.3	WEB programming	6	exam
OB 2.4	System analysis and IS design	5	exam
OB 2.5	Digital technologies of public administration	5	exam
OB 2.6	E-commerce	5	exam
OB 2.7	Informational security (Optional 1)	4	exam
OB 2.8	Algorithmization and programming (Optional 2)	5	exam
OB 2.9	Modeling with R (Optional 3)	5	exam
OB 2.10	Instrumental means IBM SPSS (Optional 4)	5	exam
<b>Optional Block 2.2</b>			
OB 2.1	Technology of creating software products	5	exam
OB 2.2	Technologies of artificial intelligence	5	exam
OB 2.3	WEB programming	6	exam
OB 2.4	System analysis and IS design	5	exam
OB 2.5	Digital technologies of public administration	5	exam
OB 2.6	E-commerce	5	exam
OB 2.11	Riskology (Optional 1)	4	exam
OB 2.12	Actuarial mathematics (Optional 2)	5	exam
OB 2.13	Analytics with R (Optional 3)	4	exam
OB 2.14	Fundamentals of blockchain technology (Optional 4)	4	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>141</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
Practical training		<b>18</b>	
Preparation and defense of bachelor's thesis		<b>8</b>	
<b>The total amount of compulsory components</b>		<b>144</b>	
<b>The total amount of optional components</b>		<b>96</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Modern economic theory.** Needs and consumer goods. Social production and resources. Economic relations of ownership. Economic systems. Commodity production as a basis of the market economy. Money in the functioning of the market. Economic market mechanism. Levels of markets and market Infrastructure. Formation of revenues in the market economy. Enterprise in the system of market relations. Entrepreneurship. Household in the functioning of the market economy. Enterprise management. Management. Marketing activity. National economy as a whole. Macroeconomic equilibrium. Macroeconomic instability.

**Macroeconomics.** Theoretical foundations of macroeconomics, macroeconomics as a science. Methodology for calculating the main macroeconomic indicators. Macroeconomic instability, unemployment and inflation. Aggregate demand and aggregate supply. Consumption, savings and investments, total expenditures and GDP; Economic functions of the state: the state in the system of macroeconomic regulation. Fiscal policy. Money market and monetary policy. Labor market and social policy. Open model of macroeconomic cycle and economic growth.

**Microeconomics.** Methodological principles of microeconomic analysis of market actors' economic behavior. Universal tools for making sound economic decisions. Regularities of functioning of microsystems of individuals, households, enterprises, organizations. Characteristics and analysis of the main types of market structures - perfect competition, pure monopoly, monopolistic competition, oligopoly. Influence of the general market equilibrium on the efficiency of the resources allocation in economy, the reasons for the limited insufficiency of market regulation, the criteria for welfare, the need for intervention in the economy.

**Higher mathematics.** Multiple sets and functions: operations with sets; display of sets; boundedness, exact limits of the numerical set; the principle of Cantor Embedded Segments; equivalent sets; countless and innumerable sets. The boundary theory: the boundary of the sequence; boundary function; partial, upper and lower bounds of the function. Continuity of the function: local properties of continuous functions; properties of continuous functions on a segment. Differential calculus of functions of one variable: derivatives and differentials of arbitrary order, properties of differentiating functions; Taylor's formula; research on extremum and plotting functions. Indefinite integral: primitive and indefinite integral, their properties; replacement of variable and integration by parts; table integrals; methods of integration: rational functions.

**Informatics.** Subject, methods and tasks of the discipline. Theoretical fundamentals of informatics, systemic provision of information processes, software tools for working with structured documents, network technologies, Internet application in the economy. Basics of Web-design, organization of computer security and information security, software tools for work with databases and data warehouses, basics of office programming, expert and training systems, prospects for the development of information technology.

**Economic and financial analysis.** Types of economic analysis. Method and method of economic analysis. Information base of economic analysis. Methods and techniques of economic analysis. Analysis of the organizational and technical level of production. Analysis of the main productive assets, material resources of the enterprise and the use of production capacity. Analysis of costs for the production and sale of products, works, services. Cost analysis of products. Profit and profitability analysis. Analysis of the financial status and financial activity of the enterprise.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines "Philosophy", "History of Ukrainian Statehood", "Business protocol and communication ethics", "Physical Training", "Foreign Language (English, German, French, Spanish)", "Crop production technologies", "Animal husbandry technologies", "Legal Personal Culture" see Section 2.1.

**Modern information communications.** Concepts of information communications and their main types, cloud services and their use in the modern information space, tools for communication, collaboration and cooperation, interaction in social networks, creation of text and graphic content, digital etiquette and optimization of interaction processes. Methodology of research on social communications. Theory and history of social communications.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Probability theory.** Basic concepts. Classification of random events. Probability of an accidental event. Classical, statistical and geometric determination of probability. Practically reliable and practically impossible event. Numerical characteristics of random variables: mathematical expectation, variance, mean square deviation, moments, asymmetry, excess, fashion, median. Laws of probability distribution: normal, indicators, uniform, Poisson. Correlation coefficient. Chebyshev's inequality. Grouping information. The principle of determination and verification of the null hypothesis. Harmonization Criteria for Testing Hypotheses.

**Optimization methods and models.** Conceptual aspects of mathematical modeling of economy. Optimization economic and mathematical models. The task of linear programming and methods of its solution. The theory of dualism. Integer programming. Special tasks of linear programming. Models of nonlinear programming. Quantitative risk assessment. Mathematical methods for solving linear programming problems, their application, advantages and disadvantages. Basic mathematical methods for solving nonlinear programming problems; advantages and disadvantages; mathematical apparatus for the constructing of econometric models.

**Econometrics.** Principles of constructing econometric models. Multiple regression models. Generalized econometric models. Econometric models of dynamics. Mathematical apparatus for constructing econometric models. Method of construction of econometric models. Method of calculation of model parameters on personal computers using application packages.

**Management.** Organization as an object of management, the essence and peculiarities of the managers' activity, development of views on management. Principles and methods of management. Internal and external environment of the organization: Communication in management and the process of making managerial decisions. Planning of organization activity: organizational structure planning. Motivation of the work of the organization's employees, system and process of control in the organization. Formation and development of the team, management and leadership. The effectiveness of the organization's management system.

**Marketing.** The essence of marketing and its modern concept. System and characteristic of modern marketing. Marketing researches. Marketing Commodity Policy. Planning new products. Marketing pricing policy. Methods of marketing pricing. Marketing Communications Policy. A complex of marketing communications. Marketing Distribution Policy. Management of distribution channels. Organization and control of the marketing activity of the enterprise.

**Finances.** Subject of financial science. Financial categories. Genesis and evolution of finances. Financial law and financial policy. Taxes and the tax system. Budget. Budget system. Insurance. Insurance market. Financial market. Finances of business entities. International finance. Financial management.

**Mathematical Statistics.** Methodological bases of statistics; statistical observation; compilation and grouping of statistical data; general statistical indicators; analysis of distribution series; concentration analysis; differentiation and similarity of distributions; selective method; statistical methods for measuring interconnections; analysis of the intensity of the dynamics; analysis of development of trends and fluctuations; index method; presentation of statistical data: tables, charts, maps.

**Accounting.** General characteristics of accounting, its subject and method. Balance sheet. Accounting records and double entry. Evaluation and costing. Documentation, inventory, technique and forms of accounting. Accounting for non-current

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assets. Inventory accounting. Accounting for cash and accounts receivable. Accounting for financial investments. Equity accounting. Accounting obligations. Accounting for labor, its payment and social insurance of personnel. Accounting for the expenses of the enterprise. Accounting for income and financial results. Financial statements.

**Cloud Computing Technologies.** The essence and definition of cloud computing. Characteristics of cloud computing. Classification of cloud service models. Models of cloud placement. Virtualization systems. Networking Virtualization Systems. Data warehouse in the Cloud. Deploying cloud environments and implementing various types of service and storage High Availability Cloud Services. Cloud management and role distribution for cloud users.

**Psychology of success.** Success and its components. The meaning of life, happiness and success. Life principles of success. Motivation for success. Resources that contribute to success. Resources to help overcoming the identity crisis. Strategies for success. Building your own strategy of success in life and profession. Successful personality and neurolinguistic programming. Neurolinguistic programming: the psycho-technical approach to success.

**Processing and analysis of spatial data.** Basic principles for collecting and processing spatial data. The main stages of the preliminary and thematic processing of spatial data. Basic and modern methods of processing time series of spatial data. Application of modern mathematical and statistical methods of data analysis. Creation of analytical materials (reports, presentations, etc. infographic materials) for making managerial decisions.

**Internet of Things.** Overview of the main features of IOT systems. Implementation of small projects based on Arduino and MIPS microcontrollers. Designing smart city systems based on Raspberry PI3.

**Digital economy.** The concept of the digital economy. The main goals of digital development. Accelerated scenario of digital development. Digitalization as the basis for the creation of the cyber-physics space and the digital transformation of the economy. Principles of digitalization. Directions of digital development. Development of digital competencies. Introduction of the concept of digital jobs. Digitalization of the real sector of the economy. Industry 4.0. Realization of projects of digital transformations. Cybersecurity and public safety. Digital education. Electronic Governance and Electronic Democracy. Harmonization with European and world scientific initiatives.

**Operations Research.** The essence of the stages of operations' study, the principles and techniques of mathematical modeling operations, the principles of selecting mathematical provision and software for the practical implementation of tasks. Mass service models. Models of inventory management. Models of human behavior. Risk Management Models.

**Modeling the economy.** Methodology and methods of modeling. Mathematical models of real economic systems. Conceptual principles of economic modeling. Algorithmic models in the economy. Production functions. Rating estimates in Economics. Models of behavior of producers, consumers. Interbranch balance model. Macroeconomic models.

**Digital Infrastructure.** The essence of digital infrastructure. The current state and trends of digital infrastructure development. Hardware components for building digital infrastructure. Software components of digital infrastructure. Security of digital infrastructure. Blockchain technology in digital infrastructure.

**Decision making systems.** Basic principles of the theory of decision-making. The process of acceptance and implementation of managerial decisions. Expert methods and decision-making systems. Methods and decision-making systems in terms of certainty. Methods and decision-making systems in risk conditions. Applying the theory of utility to decision making. Methods and decision-making systems in a conflict situation.

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**Technology of design and administration of DB and SD.** The relational data model that contains relational algebra and relational computing. Classic approach to designing databases based on the principles of normalization. Leading features of approaches to semantic database modeling, planning, developing, implementing and maintaining databases, entering into a structured language of SQL queries, types of data that are used in SQL, tools for defining database objects, data manipulation, data sampling tools. Database development tools and database applications in the integrated development environment of Access. Features of the development of databases for MySQL. The principles of the work of expert systems, neural networks, principles of knowledge base formation are considered.

**Information systems.** The essence of information systems and their importance in the management of modern organizations. The current state and trends of information technology development. Methodology for developing information systems, defining their quality and effectiveness. Basic principles of management of information resources and technologies. Formation of the information structure at the enterprise. Using Integrated Automated Information Systems in business. Determination of main characteristics of expert systems. Using technologies of artificial intelligence in the management of organizations.

**IT project management.** Theoretical basis of project management. Classification and environment of projects. Life cycle of the project. Using life cycle standards of information systems. The structure of the project. Managing the process of the project implementation. Organization of project-oriented activities. Planning in UP. Control over project management. Project management. Management of the subject area of projects. Time management in the project. Project cost management. Quality management in the project. Integrated functions of project management. Automation of project management functions.

### **Optional components**

#### ***Optional Block 2 (Student's Choice)***

**Technology of creating software products.** The basic concepts of modern programming. Linear, structural, procedural and modular programming. Fundamentals of object-oriented modulation, design and programming. Processing complex data structures, working with files. Designing graphical user interface. The main stages of the product life cycle.

**Technologies of artificial intelligence.** Modern intellectual technologies. Algorithms for making optimal solutions with the help of appropriate heuristics of System for processing visual information. Representation of knowledge in intelligent systems. Automated image recognition systems. Expert systems. Fuzzy logic and artificial neural networks. Genetic Algorithms. Evolutionary intellectual systems. The use of intelligent systems to solve problems of different types.

**WEB programming.** Basic language constructs, markup techniques, and links to other WEB-development tools. Application of cascading CSS stylesheets in HTML. Description of the CSS syntax, options for placing the CSS description in the body of the document and beyond, CSS attributes for block and elemental markup elements. Methods of positioning markup elements using CSS. Programming basics on JavaScript. Logic of development of JavaScript-code and the basic principles of its usage on World Wide Web pages. PHP programming language. Client-server technology as the main area of the PHP application.

**System analysis and IS design.** Information technologies and systems: general characteristics. System analysis. Structural and functional analysis of IS. Specification of functional requirements for IS. Simulation of data flows. Object-oriented analysis. IS

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design standards and design documentation. Instrumental design of IS. Data model. UML Standard: static and dynamic charts.

**Digital technologies of public administration.** Definition of e-government. Levels of e-government implementation. Electronic democracy. Concept of development of electronic democracy in Ukraine. Information services in management and administration. The mechanism for the introduction of petitions to the President, the Cabinet of Ministers of Ukraine and the Verkhovna Rada of Ukraine. Administrative Services Portal. Prozorro Procurement System. Official Public Finance Portal of Ukraine. Open Data Portal. Open Budget Project. Information services of public organizations.

**E-commerce.** The role of e-commerce in the digital economy. The essence of e-commerce and its features. E-Commerce Models. Marketplaces. Security and protection of information in e-commerce. Encrypting information. Protocols and security standards for virtual payments. Internet payment systems. Electronic money. Cryptocurrency. Financial systems on the Internet. Internet Banking. Market of banking services on the Internet. Online trading. Internet insurance. Ways and tools for online advertising. Internet Marketing.

### ***Optional Block 2.1***

**Informational security.** The discipline deals with the basics of security in computer networks. Deploying network infrastructure at the enterprise and setting up its robot capacity. Fundamentals of cybernetic and digital literacy among employees.

**Algorithmization and programming.** Mathematical bases of analysis of algorithms. Algorithmic strategies. Fundamentals of the theory of computability. Complexity classes of P and NP. Sort, merge and search algorithms. Combinatorial, recursive, geometric, cryptographic and heuristic algorithms. Fundamental algorithms on graphs and trees.

**Modeling with R.** Main components of the R environment. Description of R language. Objects, packages, functions, devices. Data types of R language. Time series. Organization of calculations: functions, branches, cycles. Vectorized calculations in R using apply-functions. Basic graphics capabilities. Descriptive statistics and distribution laws. Selection of law and distribution parameters in R. Checking for normality of distribution. Classic statistical models. Dispersion analysis. Generalized regression models. Simulation of structural equations.

**Instrumental means IBM SPSS.** Overview of statistical packages. Data management in IBM SPSS. Graphical features of the package, creating diagrams. Formation of descriptive statistics and frequency analysis. Conjugation tables and the chi-square criterion. Comparison of Medium Dependent and Independent Samples and Nonparametric Tests in SPSS. Single-factor and multi-factor dispersion analysis. Conducting factor analysis and discriminatory analysis in the software package. Analysis of the reliability of economic data and logistic regression. Logline analysis of conjugation tables.

### ***Optional Block 2.2***

**Riskology.** Quantitative methods for risk assessment. The function of personal utility. Quantitative characteristics of risk assessment. Game methods of decision making in conditions of uncertainty. Resolving conflict situations using game techniques. Fundamental ratios of risk and profitability. Fundamental ratios of risk and profitability of selected financial market instruments.

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**Actuarial mathematics.** Actuarial and financial affairs: current state and prospects of development. History of insurance. Insurance and securities market. Actual interest rates. Nominal interest rates. Unlimited rents. Annuities. Debt repayment. Internal rate of return. The duration of the future life of an individual of the  $x$  age: mathematical model. The power of mortality. Limited life expectancy. Life expectancy tables. Temporal and Life Insurance. Schuette-Nesbitt formula. Asymmetric annuities. Asymmetric insurance. The total amount of payment claims in the portfolio. Normal approximation. Calculation of the distribution of the total amount of claims payments. The complex Poisson distribution. Recurrent computation of complex Poisson distribution. Reinsurance. Reinsurance that blocks damages.

**Analytics with R.** Introduction to R. Data analysis tools. Fundamentals of programming in R. Types of data in R. Reading and writing data in R. Working with libraries and packages in R. Descriptive analysis. Statistical analysis in R: mean, median, mod, quantile, variance and mean square deviation, variation. Graphical representation of data in R. Linear regression. Regression analysis in R. Logistic regression.

**Fundamentals of blockchain technology.** Definition and basic concepts of blockchain technology. Advantages and disadvantages of the blockchain. Basic principles of work of blocks. Description of the blocks, their formation and closure. Mechanisms that ensure the efficiency and reliability of blockchain. Proof of Work or PoW (performed work) and Proof of Stake or PoS (particle confirmation) algorithms. Software platforms for the implementation of blockchain technology. Ethereum platform. Smart contracts. Application areas of blockchain and specific projects for its implementation. Application of blockchain technology in Ukraine.

**Bachelor  
field of knowledge "Information Technology"  
in specialty "COMPUTER SCIENCE"  
Educational-professional program "Computer Science"**

Form of Training:	Licensed number of persons:
– Full-time	50
– Part-time	50
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian
Qualification	Bachelor of Information Technology

**Concept of training**

Specialty "Computer Science and Information Technologies" is preparing a broad specialists to participate in a variety of areas that require basic knowledge of mathematics, physics, computer science, natural sciences, humanities and social and economic disciplines. Specialist focused on solving problems of analysis and synthesis of complex systems based on the latest information technologies with modern advances basic and engineering sciences.

**Practical training**

Practical training of students of the field of study is aimed at mastering the basic methods and techniques of information systems development.

**Proposed Topics for Bachelor themes**

1. Create subsystems authorization of electronic commerce
2. Develop and implement protocols to exchange information between the industrial and computer interfacing management regimes in poultry house
3. Development of a conceptual model database of the control of power consumption
4. Development of a conceptual database model agricultural enterprise information system
5. Development of smart dose of the flotation reagent drinking water

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

Graduates field of study "Computer Science" can work: software engineer, administrator local and corporate networks, expert in the design and development of information and automated systems, artificial intelligence and expert systems, expert in Web- design, etc.

**Bachelor's Program and Curriculum  
in Specialty "Computer Science"  
Educational-professional program "Computer Science"**

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC1	Safety and life	4	exam
CC2	Higher Mathematics	10	exam
CC3	Physics	4	exam
CC4	Numerical methods	4	exam
CC5	Discrete Mathematics	4	exam
CC6	Probability theory , probabilistic processes and mathematical statistics	4	exam
<b>OPTIONAL COMPONENTS</b>			
<i>Optional Block 1 (University Choice)</i>			
OB1.1	Business protocol and communication ethics	4	exam
OB1.2	History of Ukrainian statehood	4	exam
OB1.3	Philosophy	4	exam
OB1.4	Foreign Language	6	exam
OB1.5	Economics and Business	4	exam
OB1.6	Legal culture of personality	4	exam
OB1.7	Technology of production of crop and livestock production	4	exam
OB1.8	Physical Education	4	Credit
<i>Optional Block 2 (students choice)</i>			
OB1.9	Management	5	Exam
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC7	Electrical engineering and electronics	4	Exam
CC8	The theory of algorithms	4	Exam
CC9	Decision theory	4	Exam
CC10	Mathematical Methods of Operations Research	4	Exam
CC11	Programming	5	Exam
CC12	Technology of the software products creation	5	Exam
CC13	Organization of databases and knowledge	6	Exam
CC14	System Analysis	4	Exam
CC15	Computer circuitry and architecture of computers	4	Exam
CC16	Computer Graphics	4	Exam
CC17	Computer Networks	4	Exam
CC18	Intellectual data analysis based on artificial intelligence methods	4	Exam
CC19	Systems modeling	4	Exam
CC20	Object - oriented programming	6	exam
CC21	Information systems designing	4	Exam
CC22	IT project management	4	Exam
CC23	Operating Systems	4	Exam
CC24	Web- technologies and Web- design	6	Exam
CC25	Cross- platform programming	4	Exam
CC26	Computer Design Technologies	4	Exam
CC27	Technology Information Protection	4	Exam
CC28	Technology distribution systems and parallel	4	Exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

	computing		
<b>Total amount of mandatory components</b>			<b>144</b>
<b>OPTIONAL COMPONENTS</b>			
<i>Optional Block 1 (University Choice)</i>			
OB1.10	Information Technology	6	Exam
<i>Optional Block 2 (students choice)</i>			
OB1.11	Algorithms and Data Structures	6	Exam
OB1.12	Technical communication tools	5	Exam
OB1.13	Programming Mobile Application	5	Exam
OB1.14	The theory of pattern recognition and classification in artificial intelligence systems	6	Exam
OB1.15	Means of multimedia in information technologies	5	Exam
OB1.16	Statistical methods, theory flows of events	6	Exam
OB1.17	Technology development ICS	6	Exam
OB1.18	Intelligent Systems	6	Exam
<i>Optional Block 2.1 ("Information managing systems and technologies")</i>			
OB1.19.1	Modern management theory	5	Exam
OB1.20.1	Microprocessor control system	5	Exam
<i>Optional Block 2.2 (" Computer Ecological and Economic Monitoring")</i>			
OB1.19.2	Industry Environmental Monitoring	5	Exam
OB1.20.2	Computer system ecological and economic monitoring	5	Exam
<b>Total amount of selective components</b>			<b>96</b>
<b>3. OTHER TYPES OF TRAINING</b>			
	Military training course	29	
	Graduate design	2	
	Pre-diploma practice	4	
	Educational and technological practice	12	
<b>Total EEP amount</b>			<b>240</b>

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Safety and life** Acts population in emergency peacetime and wartime. Ways of population protection from damaging factors of accidents, natural disasters and modern weapons of mass destruction. Methods of forecasting of possible radiological, chemical, bacteriological, biological situation arising in case of disaster or accident. Sanitary norms and modes of work.

**Higher mathematics.** Complex numbers. Elementary functions. Continuity of functions. Derivative and differential functions. The study of functions, building graphs. The original, indefinite integral. Definite integral. Functions of several variables. Extreme functions necessary and sufficient conditions. Multiple and curvilinear integrals. Numerical, functional, degree Fourier series. Differential Equations. Linear algebra and analytic geometry.

**Physics.** Kinematics. Dynamics. Conservation laws. Thermodynamics. The ideal gas. Statistical distributions. Real gas. Phase equilibrium. Static electric field. An electric current. Static magnetic field. Electromagnetic waves. Dynamic electromagnetic field. Maxwell's equations. Mechanical and electromagnetic waves. Mechanical and electromagnetic waves. Optics. The basic principles of quantum physics. Quantum theory of atoms.

**Numerical Methods.** Direct methods for solving systems of linear equations. Solving systems of linear equations of large dimension. Numerical methods for solving nonlinear equations. Calculate the Eigen values and Eigen vectors of the matrix. Numerical differentiation and integration of functions. Solution of the Koshi problem for ordinary differential equations. Many stepping methods for solving differential equations. Implicit methods for solving hard problems. Boundary-value problems for ordinary differential equations. Integral Equations. Solving partial differential equations methods grids, finite elements, direct and iterative. Difference methods for solving parabolic equations. Methods for solving hyperbolic and elliptic equations. Methods of interpolation functions. Approximation of functions. Extrapolation and convergence features.

**Discrete Mathematics.** The theory of sets and relations. Combinatorial analysis. Mathematical logic. Logic of statements. Predicate logic. Graph Theory. Trees. Fundamentals of coding theory. The theory of formal grammars. The theory of finite automata.

**Probability Theory and Mathematical Statistics.** Basic concepts. Classification of random events. Probability of random events. Classical, Statistical and geometrical definition of probability. Almost reliable and virtually impossible event. Numerical characteristics of random variable the expected value, variance, standard deviation, moments, skewness, kurtosis, mode, median. The principle of defining and testing the null hypothesis. Criteria for approval to test the hypotheses.

## Optional components

### ***Optional Block 1 (University Choice)***

Annotations disciplines " History of Ukrainian statehood ", "Foreign Language", "Philosophy", "Physical Training" see . Section 2.1.

**Business protocol and communication ethics** The protocol is called the form of a hierarchical order, demonstrating the good manners of partners from different countries. This is a set of rules of behaviour, norms and traditions at official and informal meetings. Even in ancient times, it was said that the protocol is a sign of friendship. It is the protocol that defines methods, frameworks, behavior and etiquette.

Etiquette is the rules of the game, which is called "life". These rules are equal for all, regardless of age, gender, situation. Because they dictate not what they need to do, but how to do it. Communication in our lives plays an important role, and its psychological nature is too complicated. In the process of communication, the necessary organization and unity of actions of individuals is achieved, intellectual and emotional-sensory interaction is realized between them, a shared mood and views are formed, mutual understanding and coherence of action, solidarity and solidarity are achieved, without which no collective activity is possible.

**Economics and Business.** Business Economics. The general management functions and management techniques. Marketing: The marketing system in the enterprise, methods of market research, marketing planning. Strategic management: model, strategy, technology, strategic planning PEST. SWOT. BCG. SNW and others. Financial Management. Business planning: developing a business plan, sources of investment. Accounting and taxation burned. Management Accounting. Management. Prediction of the company. Marketing. Sales management and resources. Logistics. Budgeting and controlling. Management.

**Legal culture of personality** Basic theory of law. Principles of Constitutional Law. Fundamentals of Justice and Law Enforcement in Ukraine. Basics of administrative, financial and criminal law. Fundamentals of civil, family, business, labor, environmental, agricultural, natural-resource and land rights.

**Technology of production of crop and livestock production** Status and main directions of plant development in Ukraine; the importance and biological features of field crops, species and varieties of agricultural plants, their use, distribution and capacity of productivity and yield; modern technologies of cultivation of high, ecologically pure crops in various soil-climatic zones of Ukraine; ways and means of improving the quality of agricultural products; actions to prevent harvest losses during harvesting, transportation and storage; ways to reduce labor costs to grow crops. Scientific and theoretical foundations of technological processes and evaluation of animal products. Effective implementation of the breeding process in the desired direction and the organization of a biologically sound and economically feasible technology for the production, processing and storage of animal products. The system of practical methods of control of integral complex processes, on the basis of which the technology of production, processing and storage of animal products is carried out. Principles of organization of technological flows of raw material processing. Production of meat, fish and dairy products, eggs of various purpose.

### ***Optional Block 2 (students choice)***

**Management.** The concept and nature of management. Development of management science. Basic theory of managerial decisions. Performance Management. Planning Organization. Organization as a management function. Motivation. Management control. Leadership. Communication in management.

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## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Electrical engineering and electronics.** Basic concepts and laws of electric and magnetic circuits. DC circuit. Circuit of single-phase sinusoidal current. Transients in RLC-circuits. Operator method for calculating transients. Semiconductor referrals and contacts. Transistors. IC. Rectifiers and converters. Amplifiers and generators. Discrete electronic devices.

**The theory of algorithms.** Mathematical Foundations of analysis algorithms. Algorithmic strategies. Basic theory of computability. Complexity classes P and NP. Algorithms for sorting, merging and searching. Combinatorial, recursive, geometric, cryptographic algorithms and heuristics. Fundamental algorithms on graphs and trees.

**Decisions making theory.** General aspects of decision-making. Binary relations and decision-making. Attitude and expert evaluation. Models and methods of decision-making under conditions multi criteria. Decision making by analytical hierarchy. The concept of utility and rational choice. Models and methods of decision-making under fuzzy information, uncertainty and risk. Models and methods of multi personal decisions. Game theory, strategic and statistical game. Psycholinguistic aspects of decision-making.

**Mathematical Methods of Operations Research.** Construction of mathematical models of problem situations. Linear and nonlinear, discrete and stochastic programming. Duality. Post optimal analysis. Parametric programming. Principles of discrete programming. Methods of ZCLP solution. The method of branch and bound. Dynamic programming. Stochastic Programming. Optimization methods: features that differentiated functions matched are not differentiated in high dimensional problems. Objectives and methods of multicriteria optimization.

**Programming.** The concept of the algorithm and model algorithmic structure programming. Elements of algorithmic languages: the concept of data types, names, values, indexes, variables, constants, operations, expressions. Structured programming: sequence, branching and loops. Procedure-oriented programming. Recursion. Software development methodologies: top-down and bottom-up design, modular programming. Organization of data arrays, strings, structures and algorithms for their processing. File data structure. Dynamic data structures lists, queues, stacks, binary trees and algorithms for their processing. Algorithmic common computing tasks..

**Technology of the software products creation.** The concept of software development and the problems of complex software. The life cycle and software development processes. International and national standards for developing complex software products. Software development methodologies RUP, MSF, XP, DSDM, RAD. Software architecture, standards describing software architectures. Software design patterns. Automation software development. Software quality metrics, software quality standards. Verification, validation and testing. Standards for testing. Testing and maintenance of software products. Documenting and marketing software..

**Organization of databases and knowledge.** The main design principles database. Items of a relational database. Databases MS SQL SERVER. Table relational database. The notion of relational databases. Optimize time access to the database. Managing transactions. Processing algorithms that are stored on the server. Controlling access to the database.

**System analysis.** Building system models of problem situations. Concepts and patterns of system analysis. Methods of system analysis. System analysis Business process objects computerization. Disclosure of the uncertainties in system analysis problems. Objectives and methods of system analysis multivariate risks. System management of complex objects. Standards documentation system solutions.

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**Computer circuitry and computer architecture.** Method of image information. Logical foundations of building elements. Circuitry combinational nodes. Digital circuitry and service elements of digital and analog components. Power sources. Circuitry combinatorial nodes. Digital computers. Memory. Processors. Supercomputers. Parallel computing systems. Universal microprocessors. MP support schemes on the system board. Structures of microprocessor systems. RISC-processors.

**Computer Graphics.** Raster and vector graphics. Modern graphics system. Use of graphics API. Fundamental techniques in graphics. Two-dimensional and three-dimensional clipping. Algorithms for generating lines. The use of coordinate transformations. Basic theory of transformations Euclidean and affine transformation. Simple color model. The parallel and central projection. Approximation of spline curves and surfaces. Fractal curves and surfaces. Polygonal representation of three-dimensional objects. Visualization and Computer Animation.

**Computer networks.** General principles of the structure of computer networks. Local network. Network architectural solutions. Minutes of the lower level of large networks. General questions of network design. Minutes of medium and high level networking. Controls networks.

**Intellectual data analysis based on artificial intelligence methods** The concept of artificial intelligence. The concept of smart and intelligent problem IS FROM. Methods submission intellectual tasks and methods of finding solutions. Knowledge and knowledge representation model in SSHI. Semantic Grid SS: basic concepts, types, methods, and describe a logical conclusion to the SS. Frames: basic concepts, structure frame. Frame system. Expert Systems EC: purpose and principles of the generalized architecture, classes of problems that are solved by EC. Modern software and tools create SSHI: Visual Prolog. Allegro CLOS, CLIPS, JESS. Languages functional and logic programming.

**Systems modeling.** Models of queuing systems. Petri nets. Probabilistic modeling. Simulation. Software simulation. Planning and conducting experiments with models. Action on the simulation results. Simulation and industrial computer systems.

**Object-oriented programming.** The concept of object-oriented analysis, design and programming. The object model of the objective environment, the principles of its construction. The concept of objects, classes, and their relationships. Fundamentals of object-oriented design language UML. Fundamentals of object-oriented programming language. Data Abstraction and Encapsulation. Constructors, destructors classes. Transshipment of operations and functions. Static constant class members, friendly features and classes. Composition and collection facilities. Simple and multiple inheritance. Implementation of polymorphism. Patterns of functions and classes. Handling of exceptional situations. Classes of input and output streams. The standard class library media program developer. Class library of functionality of Windows. Development of graphical user interfaces. Basic programming, event-driven. Development of DLL-libraries.

**Information systems designing.** Approaches, principles and technologies of design IP. System and inductive approaches to IC design. Data models, process models and their design using Erwin. Standard UML: static and dynamic diagrams. Create reports using RPTS. Designing interfaces of information systems. RAD-methodology and CASE-technology creation and maintenance of IP. Technology RUP. Technology ARIS. Pahhern technology. Reengineering IP

**IT project management.** Basic concepts and methodology for managing IT projects. The life cycle of the product. Requirements management, organization design and resource management, quality, cost and risk of the project. Project Planning. Procedures and project management system. Methodology for functional simulation IDEF0. The methodology describing business processes IDEF3. Models project teams: MSF Microsoft, RUP IBM, CDM Oracle PMI-PMB



**Operating systems.** Basic concepts, evolution, variety of operating systems. Architecture and operating system resources. Planning and management of processes and threads. Multitasking, the interaction of flows, inter processor interaction. Manage RAM. The organization of memory in protected mode, control memory allocation. The logical and physical organization of file systems. Implementing file systems. Executable files. Manage O devices. Network tools Operating Systems. Interaction with the user in operating systems. Protection in operating systems. Download and administration of operating systems. Multiprocessor and distributed system.

**Web technology and web design.** The structure and principles of the Web. Launching client-server technology Web. Protocol HTTP. Custom scripts and applications. Server-side Web applications. JavaScript. Languages Development Scripting Perl, PHP, JSP. Developing applications for CGI-Perl, PHP, JSP. Basics of web applications using PHP. Interfaces Web applications interact with the DBMS. Web services and their description languages. Based on XML. Web content. CMS / CMF. Technology AJAX. Web Design.

**Cross-platform programming.** Definition and properties of the components. Interface specification as a contract. The model links. Strategies for software integration. Design and assembly of components. Marshaling. The distributed architecture of component systems. Component-oriented design. The formal design methods and visual components. Object request brokers. Transaction processing monitors. Features Component Technologies: COM/DCOM/NET, CORBA, Java Beans.

**Computer Design Technologies.** Basic concepts and methodology for designing complex objects and systems. Systemic structural level computer-aided design of complex objects. Mathematical models of design objects. CAD and CALS-technologies. CASE-technologies. Analysis, verification and optimization of design solutions by means of CAD.

**Technology Information Protection.** Methods and devices of protection and security. Security, access and authentication. Models defense. Memory protection. Data encryption. The main directions of modern cryptography. Mechanisms and protocols in PKI Key Management Information System. The main types of attacks, the principles of cryptanalysis. Basics of cryptography. Algorithms of secret and public keys. Authentication protocol. Digital Signatures. Use passwords and access control mechanisms. Questions Security and Firewalls

**Technology distribution systems and parallel computing** Connection between Grid and Web Technology. Grid-Software for PGS. Organization and management of resource allocation WSRF, GRAM, CONDOR. Grid and databases. Managing Grid Environments. File system security. Certificate of public keys. Grid-portal for users to access Grid resources and applications. Organization of parallel computing using existing technologies PVM, MPI. Parallel computing methods. Construction of parallel computing systems conveyor, matrix, multiprocessor. Construction of cluster systems. PVM, IRI parallel computing support. Models of Remote execution RPC procedures and remote RMI methods.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

**Information technology.** Subject methods and objectives of discipline, the theoretical foundations of computer science, system software processes information, software tools work with structured documents, network technology, and the use of Internet in the economy. Fundamentals of Web-design, organization of computer security and information protection software work with databases and data warehouses, office

basics of programming, expertise and training systems, the prospects of development of information technologies.

### ***Optional Block 2 (students choice)***

**Algorithms and Data Structures.** The term "algorithm". Description of the algorithm. Data types and data structures. Abstract data types. ADT list, queue, stack, trees, graphs. Analysis of algorithms and algorithmic strategies. Sorting algorithms, merge, search. Fundamental algorithms of abstract data structures.

**Technical communication tools.** General information about the telecommunications system. Generalized system of digital communication systems. The message signals, interference and their mathematical models. Mathematical models circuits. Fundamentals of information theory. Methods and tools for coding messages. Transferring messages in digital system. Obstacles protection for modern telecommunications systems. Principles of multichannel communication and their implementation in analog and digital systems. The efficiency of telecommunications. Elements of design SEZ.

**Programming mobile applications.** Programming for Android using the Android SDK; programming language Java, which will develop for other platforms (Core Java, Java EE, Blackberry , etc.); design , create and work with databases , especially the SQLite; placement app in Google Play;

**The theory of pattern recognition and classification in artificial intelligence systems.** Basic concepts of pattern recognition theory. The basic definition of science pattern recognition. Clustering. Bayesian approach. Not Bayesian problem. Nyman - Pearson. Minimax problem. Classification of recognition.

**Means of multimedia in information technologies** Multimedia tools in information technologies. Analog and digital systems. Discrete transformations. Application of digital signal processing. Multimedia. Light and color. Raster graphics. Vector graphics. The basics of animation. Text. Fonts. Principles of image recognition. Analogue and digital sound. Sound processing. Digital video. Video processing. Streaming sound and Vuelo. Multimedia in the web. Copyright.

**Statistical methods, theory flow of events.** Basics of probability theory and statistical methods of information systems. Variation number and statistical distribution. Basic theory of estimation of unknown parameters of distributions. Statistical hypothesis. Checking hypotheses. Correlation theory of random variables. Elements of variance and regression analysis. Information queuing system. Elements of the theory of random processes. Stationary random process. Elements of queuing theory. ISMO flow of events. Mathematical introduction to the theory of Markov chains. Information Network of service.

**Technology development ICS.** Definition and classification of information systems. Models of information systems. Basic concepts of information support of information systems. Simulation data. Models databases. Construction of information systems based on distributed databases. Review architectural complex information systems. Software Information Systems

**Intelligent systems.** Neural networks. Neural network adaptive resonance theory. Fuzzy sets and fuzzy neural network. Basic concepts of neural networks. The properties of the neural network training. Rosenblatt perceptron. Neural networks counter- proliferation

### ***Optional Block 2.1 ("Information managing systems and technologies")***

**Modern management theory.** The subject of management theory. Structural and functional components of the control system. Transients and characteristics of the input-output. Model -driven systems. Manageability and observation linear systems. Routh -

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Hurwitz criteria, Mikhailov, Neykvist. Discrete and digital control system. Mathematical modeling of stochastic systems. Differentiation of random functions. The main criteria optimization. Method of variations. Mathematical modeling of fuzzy systems. Design of fuzzy logic -based algorithms. Development of data analysis by fuzzy clustering. Fuzzy Petri Nets.

**Microprocessor management system.** Classification and application of microprocessor control systems. Architecture microprocessors. Using MPLAB environment for compiling and debugging programs. Programming microprocessors. Programming in assembler. Using the embedded microprocessor modules in control systems.

### ***Optional Block 2.2 (“ Computer Ecological and Economic Monitoring”)***

**Industry Environmental Monitoring.** 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.

The task of the discipline studying is to master the mathematical and algorithmic foundations of intelligent information systems, existing and promising means of data analysis and acquiring the skills of their practical application for solving specific problems in the field of environmental monitoring.

**Computer systems ecological and economic monitoring.** Architecture of monitoring system. Resources of computer system. Operating system at monitoring tools. Real Time Systems. The core of the operating system. Monolithic, layered and client-server architecture. Services of operating system. The system of priorities and scheduling algorithms. Memory management. The interaction between tasks. Industrial operating systems. The SmartDust concept. TinyOS operating system. Architecture of microprocessor system. The structure of the microprocessor and its programming model. Interrupts and their processing. Programming of interrupts. DOS and BIOS interrupts. Software interrupts. C language functions for interrupts programming. Low-level and high-level programming of systems. Hardware of monitoring systems. Information exchange at monitoring systems and its programming. Industrial interfaces of information exchange. Monitoring system sensors.

**Bachelor**  
**field of knowledge "Information Technology"**  
**in specialty "SOFTWARE ENGINEERING"**  
**Educational-professional program "Software Engineering"**

Form of Training:	Licensed number of persons:
– Full-time	50
– Part-time	50
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian
Qualification	Bachelor of software development and testing

### Concept of training

Direction of "Software Engineering" provides students ownership algorithmic thinking, software engineering methods to implement software to meet the requirements for quality, reliability, production characteristics

### Practical training

Practical training of students of the field of study is aimed at mastering the basic methods and techniques of information systems development.

### Proposed Topics for Bachelor themes

1. Software monitoring system of ecological processes.
2. Design software learning management system.
3. Design pattern recognition software system for GIS.
4. The software of the automated process control system cultivation of agricultural crops.
5. Software distributed accounting system.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

### Employment of graduates

Graduates field of study "Software Engineering " can work: software engineer, administrator local and corporate networks, expert in the design and development of information and automated systems, artificial intelligence and expert systems, expert in Web- design, Business Intelligence engineer, etc.

**Bachelor's Program and Curriculum  
in Specialty "Software Engineering"  
Educational-professional program "Software Engineering"**

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC1	Discrete structures	4	exam
CC2	Computer discrete mathematics	4	exam
CC3	Linear algebra and analytic geometry	4	exam
CC4	Mathematical analysis	6	exam
CC5	Probability theory	5	exam
CC6	Mathematical statistics	4	exam
CC7	Physics	4	exam
<b>OPTIONAL COMPONENTS</b>			
<i>Optional Block 1 (University Choice)</i>			
OB1.1	Business protocol and communication ethics	4	exam
OB1.2	Economy and Business	4	exam
OB1.3	History of Ukrainian statehood	4	exam
OB1.4	Foreign Language	4	exam
OB1.5	Legal culture of personality	4	exam
OB1.6	Technology of production of crop and livestock production	4	exam
OB1.7	Philosophy	4	exam
OB1.8	Physical Education	4	credit
<i>Optional Block 2 (students choice)</i>			
OB1.9	Logic	6	exam
OB1.10	Management	6	exam
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC8	Algorithms and Data Structures	4	exam
CC9	The software requirements analysis software	4	exam
CC10	Computer Architecture	4	exam
CC11	Architecture and design Software	4	exam
CC12	Security applications and data	4	exam
CC13	Group dynamics and communication	4	exam
CC14	Economy software	4	exam
CC15	Empirical Software Engineering Methods	4	exam
CC16	Organization of computer Networks	4	exam
CC17	Design Software	4	exam
CC18	Human-Computer Interaction	4	exam
CC19	Project Management Software	4	exam
CC20	Modeling and analysis of the subject area	4	exam
CC21	Object-oriented programming	5	exam
CC22	Operating Systems	4	exam
CC23	Databases	6	exam
CC24	Basics of Software Engineering	4	exam
CC25	Programming	6	exam
CC26	Technologies WEB programming	6	exam
CC27	Project practicum	4	exam
CC28	Professional Software Engineering Practice	4	exam
CC29	Software Quality and Testing	4	exam
<b>Total amount of mandatory components</b>		<b>144</b>	
<b>OPTIONAL COMPONENTS</b>			
<i>Optional Block 1 (University Choice)</i>			
OB1.11	Information Technology	4	exam
OB1.12	Computer Graphics	4	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

<i>Optional Block 2 (students choice)</i>			
<i>Optional Block 2.1 "System Programming"</i>			
OB1.13.1	Logical programming	6	exam
OB1.14.1	Real time operating system	6	exam
OB1.15.1	Operating system of mobile systems	6	exam
OB1.16.1	Basics system programming	6	exam
OB1.17.1	Parallel programming	6	exam
OB1.18.1	Principles of multitasking systems	6	exam
OB1.19.1	The semantics of programming	6	exam
OB1.20.1	Translators and compilers	6	exam
<i>Optional Block 2.2 "Applied Programming "</i>			
OB1.13.2	Intellectual systems	6	exam
OB1.14.2	Cross-platform programming	6	exam
OB1.15.2	Methods of object-oriented design of software systems	6	exam
OB1.16.2	Software technology dot.net	6	exam
OB1.17.2	Programming microprocessors	6	exam
OB1.18.2	Programming of mobile devices	6	exam
OB1.19.2	Technologies distributed programming	6	exam
OB1.20.2	Technologies database programming	6	exam
<b>Total amount of selective components</b>		<b>96</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
	Military training course	29	
	Educational and technological practice	12	
	Graduate design	2	
	Pre-diploma practice	4	
<b>Total EEP amount</b>		<b>240</b>	

## Annotation of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Discrete structures.** The simplest methods of proof. Elementary number theory. Computational complexity.

**Computer discrete mathematics.** The sets, functions and relations. Boolean algebra. Logic statements. Predicate logic. Graphs and trees. Basics of combinatorics. Recurrent ratio.

**Linear algebra and analytic geometry.** The coordinate system, straight and plane. Curves and surfaces of second order. Vectors, matrices, determinants. Systems of linear algebraic equations. Linear vector space.

**Mathematical analysis.** Functional dependence numeric sequence boundary and continuity functions. Differential calculus. Integral Calculus. Rows.

**Probability theory.** Basic concepts of probability theory. Models retest. Random variables and their numerical characteristics.

**Mathematical statistics.** Basics of mathematical statistics. Statistical estimates of population parameters. Statistical hypothesis testing. Elements of analysis of variance. Elements of the theory of correlation.

**Physics.** Classical mechanics and electrodynamics. Physical basics of computers and telecommunications.

#### Optional components

##### *Optional Block 1 (University Choice)*

Annotations disciplines " History of Ukrainian statehood ", "foreign language", "Philosophy", "Physical Education" see. Section 2.1.

**Business protocol and communication ethics** The protocol is called the form of a hierarchical order, demonstrating the good manners of partners from different countries. This is a set of rules of behaviour, norms and traditions at official and informal meetings. Even in ancient times, it was said that the protocol is a sign of friendship. It is the protocol that defines methods, frameworks, behavior and etiquette.

Etiquette is the rules of the game, which is called "life". These rules are equal for all, regardless of age, gender, situation. Because they dictate not what they need to do, but how to do it. Communication in our lives plays an important role, and its psychological nature is too complicated. In the process of communication, the necessary organization and unity of actions of individuals is achieved, intellectual and emotional-sensory interaction is realized between them, a shared mood and views are formed, mutual understanding and coherence of action, solidarity and solidarity are achieved, without which no collective activity is possible.

**Economics and Business.** Business Economics. The general management functions and management techniques. Marketing: The marketing system in the enterprise, methods of market research, marketing planning. Strategic management: model, strategy, technology, strategic planning PEST. SWOT. BCG. SNW and others. Financial Management. Business planning: developing a business plan, sources of investment. Accounting and taxation burned. Management Accounting. Management.

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Prediction of the company. Marketing. Sales management and resources. Logistics. Budgeting and controlling. Management.

**Legal culture of personality.** Basic concepts, terms and definitions. Subject, tasks and principles of law. Principles of Constitutional Law Ukraine. Principles of Civil Law of Ukraine. Basics of labor law in Ukraine.

**Technology of production of crop and livestock production** Status and main directions of plant development in Ukraine; the importance and biological features of field crops, species and varieties of agricultural plants, their use, distribution and capacity of productivity and yield; modern technologies of cultivation of high, ecologically pure crops in various soil-climatic zones of Ukraine; ways and means of improving the quality of agricultural products; actions to prevent harvest losses during harvesting, transportation and storage; ways to reduce labor costs to grow crops. Scientific and theoretical foundations of technological processes and evaluation of animal products. Effective implementation of the breeding process in the desired direction and the organization of a biologically sound and economically feasible technology for the production, processing and storage of animal products. The system of practical methods of control of integral complex processes, on the basis of which the technology of production, processing and storage of animal products is carried out. Principles of organization of technological flows of raw material processing. Production of meat, fish and dairy products, eggs of various purpose.

### ***Optional Block 2 (students choice)***

**Logic.** The object, subject and method of the science of logic. Thought and language. Logic and Political Science. Basic forms and laws of thought. The basic logical laws.

**Management.** The essence, principles and functions of modern management. Management Tools. The organizational structure of public management. State management in the field of information industry. The activity of members of management.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

**Algorithms and Data Structures.** Basic data structures: stacks, queues, linked lists, cash tables, trees, graphs. Basic computing algorithms: sorting, hash tables and algorithms exclusion conflicts binary tree search, presentation of graphs, and go in depth and in width. Recursion. Analysis algorithms.

**The software requirements analysis software.** The types of requirements, functional and non-functional attributes of quality. Specification and documentation requirements. Languages writing specifications. Basics of requirements engineering software. Matching requirements and risk management.

**Computer Architecture.** Digital logic. Submission of data. Organization of memory. Functional organization devices, ensuring their interaction. Multiprocessor Architecture. Modern architecture.

**Architecture and design Software.** Technologies software development. Structure and architecture of the software. Strategies and methods of designing software. Quality analysis and evaluation of software design. Notation and design support tools.

**Security applications and data.** Principles of safety and protection in the software. Fundamentals of information security systems in the software.

**Group dynamics and communication.** Basics of work effectively with colleagues, acquaintance with the motivation of people, the concept of group dynamics. Practice extraction requirements, interviews, scripts, prototypes, "explanatory meeting" supervision.



Strategy auscultation, persuasion and negotiation. Review written technical documentation to identify different kinds of problems. Creating a formal presentation of good quality. Principles of effective oral communication.

**Economy software.** Features of functioning entities at market conditions. Key indicators of enterprise resource potential and efficiency of its use. Business organization and management bases.

**Empirical Software Engineering Methods.** Basics of of descriptive statistics. Applying the principles of discrete probability IT.

**Organization of computer Networks.** Distributing computing. Basics of networking and telecommunications. Network Management. Principles of safety and protection in the software.

**Design Software.** Basics of modeling. Models construction. The types of models. Plan your design. Languages construction. Integration. The quality of construction. Templates design.

**Human-Computer Interaction.** Psychological principles of human-machine interactions. Analysis, design and prototyping man-machine interface. Functional components and properties of man-machine interface. Utilities man-machine interface. Assessment of quality of man-machine interface.

**Project Management Software.** The processes of project management, software lifecycle Project Management. Managing deadline and the cost of the project. Human potential and communications. Quality management and project risks.

**Modeling and analysis of the subject area.** Design software-based domain model. Pattern design. Software development through testing. Language modeling domains.

**Object-oriented programming.** Object-oriented design. Encapsulation and hiding information. Distribution of conduct and implementation. Classes and subclasses. Inheritance (override dynamic linking). Polymorphism (polymorphism subtypes and inheritance). The hierarchy of classes. Classes of collections and iteration protocols. The internal representation of objects and table methods.

**Operating Systems.** Basics of operating systems. Parallelism (multitasking). Planning and scheduling processes. Organization of virtual memory. Managing devices.

**Databases.** Information models and systems. Relational database. Languages queries to the database. Processing transactions. Distributed database.

**Basics of Software Engineering.** Engineering software-based. Basics of modeling. Technologies software development. Basics of requirements engineering software. Written communication.

**Programming.** The basic design of programming. Algorithms and solving problems. Fundamental data structures. Recursion. Programming events.

**Technologies WEB programming.** The structure and principles WEB. Creating Web applications. Client and server scenarios.

**Project practicum.** The principles of a systematic approach to software development. Design templates and documentation requirements. Technologies software development. The processes of quality management software. Human potential and communications. Quality management and project risks.

**Professional Software Engineering Practice.** The concept of quality and culture of the software. The system of rules of ethics and professional conduct aesthetic code software engineer. The nature and role of software engineering standards. Social, legal, historical and professional issues and interests. The nature and role of professional societies.

**Software Quality and Testing.** Methods of tests. Automated testing tools. Quality standard software. The processes of quality management software. Terminology and basics of verification and certification software.

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## Optional components

### Optional Block 1 (University Choice)

**Information Technology.** Information systems and technology. The main Resources Internet. Libraries and databases. Trends in the world of information technology. Review and comparative characteristics of existing Web-browsers. Characteristics of the existing search engines to use online resources.

**Computer Graphics.** Raster and vector graphics. Modern graphics system. Use of graphics API. Fundamental techniques in graphics. Two-dimensional and three-dimensional clipping. Algorithms for generating lines. The use of coordinate transformations. Basic theory of transformations Euclidean and affine transformation. Simple color model. The parallel and central projection. Approximation of spline curves and surfaces. Fractal curves and surfaces. Polygonal representation of three-dimensional objects. Visualization and Computer Animation.

### Optional Block 2 (students choice)

#### Optional Block 2.1 "System Programming"

**Logical programming.** The main aim of the course is to study the basis of logical programming with ProLog and Mercury. During the course students will learn the basis of declarative programming, algebra of predicates and complete the achieved knowledges with practical tasks

**Real time operating system.** Real Time Systems. Systems of hard and soft real time. Requirements for real time operating systems. The functions of the operating system kernel. Abstractions in the operating system. Versions of the kernels for real time operating system. Monolithic and layered architecture. Client-server architecture. Software interfaces. Services at real time operating system. The system priorities and scheduling algorithms. Memory management. The interaction between tasks. Timers. Input/output services. Interrupts and their processing. Programming of interrupts. DOS and BIOS interrupts. Software interrupts. Industrial operating systems. QNX operating system. RTLinux. The exchange of information in real time systems and its programming. Programming of interface of real time system. Creation of hardware-software real time complex.

**Operating systems of mobile systems.** The course is devoted to studying the architecture of mobile operating systems, features of the use for different mobile devices, and features of system and applied mobile software development.

**Basics system programming.** This course deal with the classical models, methods and algorithms of system programming, gives a fundamentals of the theory, gives examples of programs. The main focus is on explaining how to use the knowledge gained in practice. The course is divided into lectures, including theoretical material on a low-level programming language and laboratory works on system programming. The theoretical foundations of system programming are studied in detail. The organization of operating systems is studied.

**Parallel programming.** Methods of parallel computation are proposed for solving a number of optimization problems, methods for organizing optimal parallel control and information processing processes, methods of dispatching and synchronization. The application of parallel programming methods in the development of GRID-technologies is discussed. The implementation of the language of the logical conclusion of PROLOG in the SPMD architecture is considered. The problem of optimization of information service by a network database is under investigation when it is turned into a multi-channel queuing

system. Rotation of database segments provides multi-channel access and synchronization of access to them.

**Principles of multitasking systems.** Software Requirements Governing calculators. Features of construction and programming of real-time systems. The concept of multitasking processes and threads. The formal description of system tasks that run on a single processor. Functions of the operating system software environment in real time. Types of scheduling performance problems. Static schedule without interruption. Dynamic schedule with interruptions (multitasking with squeezing). Curriculum quantized-parallel (multitasking without squeezing). Features of the calculation of schedules and building load calculator charts. Features and software mechanisms operating systems real time. Features of algorithmic and software implementation of different types of scheduling performance problems.

**The semantics of programming.** The semantics of programming - discipline that studies the formalization value structures of programming languages by building their formal mathematical models. As tools for building such models can be used by different means, such as mathematical logic,  $\lambda$ -calculus, set theory, category theory, model theory, universal algebra. Formalization of semantics of programming languages can be used to describe the language determining properties of language and for the purposes of formal verification software on this programming language. The course discusses operational, broadcasting and interpretive semantics.

**Translators and compilers.** This course deal with the fundamental principles of translation: the compilation, the interpretation, the dynamic compilation. Deal with the basics of compilation, methods of syntactic and semantic analysis and optimization of object code. Deal with the basis of the interpretation - the process of reading and executing of the code, not in the machine, but in the high-level program.

### ***Optional Block 2.2 " Applied Programming"***

**Intellectual systems.** Modeling knowledge in intelligent systems. Cash and logical systems of knowledge bases. Experts, ontological and many agent system.

**Cross-platform programming.** Definition and properties of components. Interface specification as the contract. The model links. Strategy of integration software. Design and assembly of components. Marshaling. Distributed architecture component systems. Component-oriented design. Formal design methods and visual components. Brokers object requests. Monitors processing transactions. Features component technologies: COM / DCOM / NET, CORBA, Java Beans.

**Methods of object-oriented design of software systems.** Classes and objects. Concept OOP. Imitation. Charting packages, component placement, classes and objects. Templates and design patterns.

**Software technology dot.net.** Overview of the platform Microsoft .NET. Cross-language integration in .NET. Collections .NET. Remoting objects .NET (.NET-Remoting). Programming in C #.

**Programming microprocessors.** Programming real-time systems management tool as simple and complex systems using PCs and microcontroller technology. The composition of real-time systems. Types of operating systems real time. Parameters operating systems real time. Using interrupts with low-level programming. Use timers with low-level programming. Communications protocol RS-232. Programming serial data exchange. Using the built-in methods of system libraries Windows.

**Programming of mobile devices.** Programming for Android using the Android SDK; programming language Java, which will develop for other platforms (Core Java, Java EE, Blackberry, etc.); features SQLite; placing the app in Google Play.

**Technologies distributed programming.** Parallel computing using existing technologies PVM, MPI. Parallel computational methods. Construction of parallel computing systems conveyor, matrix, multiprocessor. Building cluster systems. Tools supporting parallel computing PVM, MPI. Models RPC RPC and remote application of RMI.

**Technologies database programming.** Languages databases. SQL programming as a panacea to access data in relational databases. T-SQL as a procedural programming language integrated with MS SQL Server. The standard ODBC and ADO. Using ADO-interface to access data by means of high-level programming.

**Bachelor**  
**Field of Knowledge " Information Technologies "**  
**in Specialty " COMPUTER ENGINEERING "**  
**Educational-professional program «COMPUTER ENGINEERING»**

Form of Training:	Licensed number of persons:
– Full-time	50
– Part-time	50
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian
Qualification	Bachelor of Computer Engineering

### **Concept of training**

The student training in «Computer Engineering» allows to graduates in programming and software to design and use the system and application software as a professional programmer, including the design and use of information systems, databases, computer-aided design, interactive systems, embedded applications for specialized computer systems. In the field of computer hardware technology the student, training in «Computer Engineering» allows to graduates to design and develop specialized computer systems, controllers, adapters, local, global and corporate computer networks at the level of individual units and universal devices.

### **Practical training**

Practical training of «Computer Engineering» students aimed at mastering the basic methods and techniques for developing of computer systems hardware and software.

### **Proposed Topics for Bachelor theses**

1. The Development of specialized function-oriented computer system for solving specific problems in a particular subject area.
2. Designing of GIS hardware and software.
3. Development of system software of computer systems.
4. Development of hardware and software of information protection facilities in computer systems.
5. Development of tools for increasing the computer networks security.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalogue.

### **Employment of Graduates**

The Graduates «Computer engineering» can hold a post the professionals of information technologies, programming, system administration, administration of computer local and corporate networks.

**Bachelor`s Program and Curriculum in Specialty  
«Computer Engineering»  
Educational-professional program «Computer Engineering»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC1.	Higher mathematics	12	exam
CC2.	Physics	6	exam
CC3.	Programming	11	credit
CC4.	The theory of electric and magnetic circuits	5	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1.	History of Ukrainian statehood	4	exam
OB 1.2.	Business protocol and communication ethics	4	exam
OB 1.3.	Economics and business	4	exam
OB 1.4.	Foreign Language	6	exam
OB 1.5.	Philosophy	4	exam
OB 1.6.	Plant growing and livestock breeding production technologies	4	exam
OB 1.7.	Legal culture of personality	4	exam
OB 1.8.	Information Technologies	6	exam
OB 1.9.	Physical Training	4	credit
<b>The volume of components of the general training cycle</b>		<b>36</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC5.	Computer Logic	10	exam
CC6.	Algorithms and methods of computation	4	credit
CC7.	Discrete Mathematics	4	credit
CC8.	Computer electronics	4	exam
CC9.	The databases organization	6	exam
CC10.	Computer circuitry	10	exam
CC11.	Probability Theory and Mathematical Statistics	4	exam
CC12.	Software engineering	4	exam
CC13.	Computer Architecture	8	exam
CC14.	Technology designing of computer systems	4	exam
CC15.	Parallel and distributed computing	4	exam
CC16.	System programming	7	exam
CC17.	Computer networks	8	exam
CC18.	Computer systems	7	exam
CC19.	Information protecting in computer systems	5	exam
CC20.	System software	8	exam
CC21.	Practical training	6	credit
CC22.	Preparation and defense of bachelor thesis	7	Bachelor`s Thesis
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block 2.1 «Computer Systems and Networks»</b>			
OB2.1.1.	System analysis	4	exam
OB2.1.2.	Digital Circuitry of Specialized Devices	4	exam
OB2.1.3.	Object-oriented programming	5	exam
OB2.1.4.	Specialized computers	4	exam
OB2.1.5.	Computer Graphics	5	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB2.1.6.	Web technology and web design	4	exam
OB2.1.7.	Cross-platform programming	4	exam
OB2.1.8.	Hardware and software of GIS	4	exam
OB2.1.9.	Educational programming practical training	6	credit
OB2.1.10.	Educational practical training in digital devices development	6	credit
OB2.1.11.	Computer networks administration	5	exam
OB2.1.12.	Mobile computer systems	4	exam
OB2.1.13.	Programming in modern operating systems environment	5	exam
<b>Optional Block 2.2 «Specialized Computer Systems»</b>			
OB2.2.1	Decision Support Systems	4	exam
OB2.2.2.	Specialize Devices of Digital Circuits	4	exam
OB2.2.3.	Modern Programming Techniques	5	exam
OB2.2.4.	Microcontroller Systems	4	exam
OB2.2.5.	Hardware of Computer Graphics Systems	5	exam
OB2.2.6.	Network Information Technologies	4	exam
OB2.2.7.	Java Programing	4	exam
OB2.2.8.	Real Time GIS	4	exam
OB2.2.9.	Computer technology practical training	6	credit
OB2.2.10.	Computer electronics practical training	6	credit
OB2.2.11.	Computer networks designing in SCS	5	exam
OB2.2.12.	Programing of Mobile Computer Systems	4	exam
OB2.2.13.	Development of Applications in modern OS	5	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>170</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Higher mathematics.** Complex numbers. Elementary functions. Continuity of functions. Derivative and differential functions. The research of functions. Integrals. Functions of several variables. Extreme functions. Series. Differential Equations. Ordinary differential equations of the first order. Cauchy problem. Differential equations of higher order. Systems of linear differential equations. Linear algebra. Vector algebra. Analytic geometry. Systems of linear algebraic equations. Linear spaces and linear operators.

**Physics.** Mechanics. Kinematics and Dynamics. Models of classical mechanics. Work and energy. Basic theory of relativity. Electricity and magnetism. The electric field. Direct electric current. Alternating electric current. The magnetic field. Electromagnetic induction. Maxwell's equations. Optics. Wave optics. Interference. Diffraction. Polarization. The dispersion. Quantum physics. Photons. The model of the atom. Schrödinger equation. Elements of solid state physics.

**Programming.** Programming Fundamentals. Programming Paradigms. Algorithms and problem solving. The concept of the algorithm and typical algorithmic programming structure. Fundamental data structures. Structured programming. Procedure-oriented programming. Syntactic and semantic structures of programming languages. Recursion. Paradigms of object-oriented programming. Object-oriented technologies. Algorithms and Data Structures. Programming of dynamic data structures. Exceptions handling.

**The Theory of electric and magnetic circuits (electrical engineering).** The theory of linear DC circuits. Basic laws of electrical circuits. Methods of the electrical circuit analysis. Linear circuits of sinusoidal current. Properties and analysis of AC networks.



Resonant effects and frequency characteristics. Basic theory of four-pole. Three-phase networks. Non-sinusoidal transients in linear electric circuits. Electric circuits of non-sinusoidal periodic current. Transients in linear electric circuits. Electric circuits with distributed parameters and elements of nonlinear circuits theory. Transients in circuits with distributed parameters. General characteristics of nonlinear circuits and methods of its calculation.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of disciplines «History of Ukrainian Statehood», «Business Protocol and Communication Ethics», «Economics and Business», «Foreign Language», «Philosophy», «Physical Training», «Legal Culture of Personality» «Plant Growing and Livestock Breeding production technologies» see Section 2.1.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

**Computer Logic.** Basic terms and definitions of computer logic. Information basics of computer technology. Algebra of switching functions. Methods of switching functions minimization. Synthesis of combinational circuits in different element bases. Basic theory of digital machines with memory. Synthesis of digital machines with memory. Analysis of logic and dynamic processes in digital machines. Typical digital circuits of computers. Introduction to the theory of number system notation. Forms of representation and coding of numbers in computers. Fixed-point and floating-point operations. Synthesis of operating machines.

**Algorithms and methods of computation.** Algorithms analysis. Algorithmic strategies. Construction of algorithms. Problems of linear algebra. Methods of computation. Tasks of nonlinear algebra. The solution of differential equations. Solution of integral equations. Problems in mathematical physics. Methods of approximation functions. Optimization methods.

**Discrete Mathematics.** Set theory and relations. Algebra. The basic operations of algebra of sets. Graph theory. The theory of functions. Combinatorics. Trees. Coding theory.

**Computer electronics.** Basics of analogue and pulse electronic devices. Basic principles and definition of computer electronics. Diodes. Bipolar and unipolar transistors. Linear and differential amplifiers. Devices of digital electronics. Devices based on flip-flops. Generating devices. Semiconductor memory devices. Logic devices with programmable characteristics.

**The databases organization.** Information systems and database management systems. The concept of information and information systems. Classification of information systems. Architecture of Information System. Database functions. Data models. The hierarchical and network data models. The relational model and its characteristics. The structure of a relational data. Database tables. Potential, primary and external keys. The integrity of the relational data. Operations of the relational algebra and relational calculus. Query language for relational databases. SQL Concepts. Requests for data reading. Aggregate functions. Queries for grouping. Complex queries. Requests for updates. The concept of data indexation. Methods of indexes organization. The internal database programming language. Client/server database technologies. Architecture of client/server database. The concept of open systems. Open communication with the database. ODBC.

Access technologies Access BDE, ADO, ADO.Net. JDBC. Transactions. Administration. ACID properties of transactions. Problems of parallelism. Transactions isolation levels. Transaction management in programming languages. Distributed database. The logical database design. Physical database design. Hardware and software components. Database security.

**Computer circuitry.** Circuitry of standard units and blocks. Fundamentals of computer circuitry. Typical units and blocks of digital technologies. Flip-flops. Registers. Counters. Binary adders. Decoders. Multiplexers. Encoders. Memory devices. RAM. Register and buffer memory. ROM. Circuitry of arithmetic devices. Varieties of adders. Arithmetic devices structures for different purposes. Varieties and implementation of information channels. Circuits based on LSI and VLSI systems. Circuitry of FPGA.

**Probability Theory and Mathematical Statistics.** Probability theory and mathematical statistics. Random events and its analysis. Random variables. Systems of random variables functions. Mathematical statistics and processing of measurement results. Verification of statistical hypotheses. Applied methods of mathematical statistics. Random processes. Fundamentals of information theory.

**Software engineering.** Basic concepts and problems of software development. The life cycle of software; international standards of software lifecycle. Models and methodologies of software development. Analysis, specification, verification and validation of software requirements. Designing of software architecture. Patterns of software design. Designing of the user interface. Methodology of modeling SADT, IDEF, DFD, ELM, OOAD. Modeling languages. Behavioral modeling. Diagrams of states, activity, interaction, sequence, time. Structural modeling. Functional modeling. Simulation of data streams. Means of simulation automation. The tasks of project management. Risk management software project. Control and monitoring of the project state. Organization of the project team. The roles and areas of responsibility team members. The quality of the software. Verification and validation of software. Software Testing. The Code optimization and refactoring. Aspects of software productivity. Integrated software development environment. Project Management System. Documents version and architectural features control system. Automation tools of projects assembly. Tools of testing process automation.

**Computer Architecture.** Von Neumann architecture. Hierarchical principle of hardware and software construction of computers. Instruction sets. The structure and formats of instructions and stages of its execution. Program control organization of program execution. Purpose, classification and characteristics of processors. Architecture of arithmetic-logic devices with distributed and concentrated logic. Features of processor architecture to processing of the numbers with fixed and floating point. Functions and general organization of control in computers. Types of control (centralized, distributed, synchronous, asynchronous, combined control). Architecture of control units with hard-wired logic and flexible logic. Multi-level memory of computers (scratch-pad, operational, buffer (cache) memory. The organization of pages and segments in virtual memory. Interaction of all memory levels. Multiprogram modes of processor functioning. Protect of memory sections. Modes of processor functioning with external devices. The program data sharing, interrupt processing, organizing of direct memory access. Architecture of data input-output facilities. Features Architecture of microprocessor sets of various purpose (single-chip microprocessor, sectional microprocessors, microcontrollers). Areas of microprocessor systems architecture development.

**Technology designing of computer systems.** The methodology of computer systems designing. General characteristics of computer systems CAD. System design. Operational design. Functional design. The technical design. Systems of design of computer systems.

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**Parallel and distributed computing.** Parallel and distributed computing foundations. The structures of parallel and distributed computer systems. Parallel algorithms: representation, construction and analysis. Parallel algorithms for linear algebra problems. The processes (streams). Process state. Interaction processes through shared variables. The task of synchronization and mutual exclusions and facilities of its solution: atomic variables, semaphores, mutex, events, critical sections, monitors. The interaction of processes by link messages. Primitives Send/Receive. Rendezvous mechanism. Models of parallel computation. Parallel programming languages. Library of parallel programming. Examples: MPI, PVM, OpenMP, Win32. Programming for multicore systems. Distributed computing. Client-server model. Sockets. Remote methods. Programming for cluster systems.

**System programming.** Assembler language as efficient programming facility. Architecture and instruction set of basic processor. Programming of subroutines in assembler language. Technologies of development of multimodule system programs. Usage of software libraries. Processing of data structures in system programs. Programming of tables and graphs processing in system programs. Programming of conversions in programs of translation. Basic concepts of the theory of grammars. Basic programming of lexical and syntactic analysis. Types of semantic processing in translators. Construction of elements of control programs.

**Computer networks.** Introduction to network technologies. Generalized structure of computer networks. Basic network topology. System network architecture. Open systems interconnection basic reference model. Communication systems of computer networks. Local networks. Global networks. Wireless and mobile networks. Protocols. Network operating systems. System and application software of networks. Planning of computer networks. Control of computer networks. Administration of computer networks. Security of computer networks.

**Computer systems.** Subject, tasks and methods of the theory of computer system (CS). Computational processes in CS and their models. Planning of work in the CS. CS metrics: productivity, efficiency, reliability. Structural organization of CS of different generations. Classification of parallel CS. CS with fixed communication system. CS with reconfigurable communication system. Memory organization in CS. Organization of data input-output in CS. Organization of data transfer in CS. Computer systems of SISD class. Computer systems of SIMD class: matrix, vector, associative. Computer systems of MISD class: conveyor computer systems. CS of MIMD class: multiprocessor, multicomputer systems with heterogeneous access to RAM, cluster systems, GRID systems. Computer systems with non-conventional architectures. CS interfaces. Basic concepts of fault-tolerant CS. Structural aspects of fault-tolerant CS construction.

**Information protecting in computer systems.** Fundamentals of information security in computer systems. Conceptual models of information security systems organization in CS. Access control and distinction of access rights to information. Symmetric schemes, keys and encryption systems. Asymmetric schemes, keys and encryption systems. Authenticity confirmation of messages and users. Standards and criteria for the certification of information security facilities.

**System software.** System software architecture. Structural organization and method of resource control in computer systems (CS). Fundamentals of construction and design of system software in CS. Methodology of development of dynamic and static task scheduling and dispatching in CS. The structures and functions of the OS. Task control. Memory control. Data control. IO devices control. Interrupts. Processes control. Modern operating systems. Resource control in distributed systems, GRID and CLOUD systems.

## Optional components

### *Optional Block 1 (University Choice)*

Annotations of disciplines “Starting your own business based on business design”, “Business protocol and communication ethics”, “Crop production technologies”, “Animal husbandry technologies”, “Information technology in the industry” see Section 2.1.

**Information technology.** Subject, methods and objectives of discipline, the theoretical foundations of computer science, system software of information processes, program tools for structured documents creating, network technologies, the use of Internet in the economics. Web-design fundamentals, computer security and information protection organization, software work with databases and repository software, office programming fundamentals, expert and training systems, the prospects of information technologies development.

### *Optional Block 2 (Student's Choice)*

#### *Optional Block 2.1 « Computer Systems and Networks »*

**System analysis.** System models creation of problem situations. Concepts and patterns of system analysis. Methods of system analysis. System analysis of Business process computerization objects. Disclosure of the indeterminacies in system analysis problems. Objectives and methods of system analysis multifactorial risks. System management of complex objects. Standards of system solutions documentation.

**Digital Circuitry of Specialized Devices.** TTL elements equivalent circuits. Delay devices. Devices for pulse formation based on TTL elements. Transient analysis in specialized devices. Integrated circuits of monostable multivibrators. Multivibrators. The different types of multivibrators. Converters of signal levels between the different logic element systems. Level converters between TTL signals and signals of serial interfaces RS232C, RS485, «current loop» interface.

**Object-oriented programming.** Paradigms of object-oriented programming (OOP). The concept of programming technologies. The concept of objects, classes, and their relationships. Fundamentals of object-oriented programming language. Data Abstraction and Encapsulation. Constructors, destructors of classes. Static constant class members, friendly functions and classes. Composition and collection facilities. Simple and multiple inheritance. Implementation of polymorphism. Patterns of functions and classes. Handling of exceptional situations. Classes of input-output streams. The standard classes libraries of program developer environment. Development of graphical user interfaces. Basic event-driven programming.

**Specialized computers.** Specialized computer systems (SCS) architecture. SCS design. Technologies of SCS design. Features of SCS structures. Specialized structures of microprocessors with control features. Instruction set of basic processor. Memory organization. Software organization of SCS. Organization of communication with object. The subsystem of digital and analogue data input-output. Software testing technologies of SCS.

**Computer Graphics.** Raster and vector graphics. Modern graphics systems. Use of graphics API. Fundamental techniques in graphics. Two-dimensional and three-dimensional clipping. Algorithms for lines generating. Coordinate transformations. Basic theory of transformations. Euclidean and affine transformations. Simple color models. The parallel and central projection. Approximation of curves and surfaces by splines. Fractal

curves and surfaces. Polygonal representation of three-dimensional objects. Visualization and Computer Animation.

**Web technology and web design.** The structure and principles of the Web. Introduction to client-server technology Web. Protocol HTTP. Client scripts and applications. Server Web-applications. JavaScript's. Languages of Scripting Development Perl, PHP, JSP. Developing of CGI-applications on Perl, PHP, JSP. Basics of Web-applications using PHP. Interaction interfaces of Web-applications with the data bases. Web services and their description languages. Fundamentals of XML. Web content development. CMS/CMF. Technology AJAX. Web Design.

**Cross-platform programming.** Definition and properties of the components. Interface specification as a contract. The model links. Strategies for software integration. Design and assembly of components. Marshaling. The distributed architecture of component systems. Component-oriented design. The formal design methods and visual components. Object request brokers. Transaction processing monitors. Features of Component Technologies: COM/DCOM/NET, CORBA, Java Beans. The main tools of language Java. Graphic interface AWT of language Java. Graphic interface Swing of language Java. Internationalization of applications in Java. Collections in Java. Working with database in Java. Programming of Java applications. Working with Internet protocols in Java. Network Services in Java.

**Hardware and software of GIS.** Organization and operation principles of geoinformational systems (GIS). Architecture of GIS. The data in geoinformational systems. Data representation. Hardware of GIS. The organization of real time GIS. Objects properties in GIS. Mathematical models of information channels. Application of GIS. Software of GIS. Data analysis in GIS. Map metric operations in GIS. Spatial analysis in GIS. Applied aspects of geo-data analysis.

**Computer networks administration.** Construction and administration of computer networks hardware part . Types and applications of active and passive network equipment. Choosing equipment based on the needs of a specific network, developing of network structure for a given network technology. Assessment of network performance.

**Mobile computer systems.** Architecture of Mobile Computer Systems (CS). Hardware of mobile CS. Software of mobile CS. Programming of mobile CS. Programming in Android using the Android SDK. Databases, features SQLite.

**Programming in modern operating systems environment.** Platform. NET and its application. Basic concepts of programming language C#. The semantics of the C# basic structures. Objects and classes. The concept of polymorphism and its implementation in C#. Polymorphic methods. Advanced capabilities of programming language C#.

Characteristic properties of UNIX systems. The typical structure of the OS. Structure and functions of kernel components. Instruction interpreter. The syntax and semantics of the command interpreter language. The structure of the program (script). Creating a physical file system. Virtual file systems. System files containing information on the mounted file systems. Physical and logical models of file system. Categories of OS users. The algorithms of checking the access rights to system resources. User accounts. File types and their features as file system objects. Program functions of creation and access to files. The concept of process. Process creating. The process life cycle. Process priorities. Demons as special processes. The need for interaction between different processes. Information interaction and control interaction. Processes sync. Trends of UNIX systems.

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**Optional Block 2.2 «Specialized Computer Systems»**

**Decision Support Systems.** General aspects of decision support systems. Binary relations and decision-making. Attitude and expert evaluation. Models and methods of decision-making under conditions of multi criteria. Decision making by analytical hierarchy. The concept of utility and rational choice. Models and methods of decision-making under fuzzy information, uncertainty and risk. Models and methods of multi personal decisions. Game theory, strategic and statistical game. Psycholinguistic aspects of decision-making.

**Specialize Devices of Digital Circuits.** Systems of information communication in computer systems. Specialized devices for information communication on the physical level. Monostable devices. Pulse forming devices. Communication channels. Signal digitization. Organization of signal converting. Serial data interfaces. Signal converting for information communication by a serial interface. Information communication by current. Calculation of the dynamic parameters and characteristics of specialized devices.

**Modern Programming Techniques.** The concepts of the programming technologies. The basic technologies of object-oriented programming. CASE-technologies. Applications of CASE-technologies. Software design tools. Object-oriented visual programming. Classes of data.

**Microcontroller Systems.** Microcontroller (MC) architecture. Instruction set of basic MC. Features of memory organization. Addressing methods. Events processing. General organization of interruptions system. Timers of MC. Real time systems. The subsystem of analogue data input-output. Indication subsystem. Serial port. Synchronous mode of data transferring/receiving. Features of industrial MC networks. Features of the MC software testing. MC emulators. Arithmetic operations programming. Bit operations programming. Development of MC systems.

**Hardware of Computer Graphics Systems.** Architecture of computer graphics (CG) systems. Mathematical foundations of computer graphics. The basic operations of computer graphics systems. Methods of object approximation. Geometrical, topological and power parameters. The task of image synthesis. Software Development for two-dimensional visualization processes. The structure and processing algorithms for visualization of three-dimensional objects. Development and simulation of specialized processors to implementation of CG algorithms. The development of specialized hardware blocks for CG algorithms implementation. Modern graphics cards.

**Network Information Technologies.** Computer networks standards. Personal, local and global networks standards. Analysis methods of computer networks state. Computer networks software. Operating systems resources for the analysis of computer networks. Network programming.

**Java Programing.** Structure of programming system Java. Java-machine. Basic data types and operations with it. Instruction syntax and semantics. Characteristics of basic constructions. Means of object-oriented programming language Java. Classes, methods, properties. Syntax of class definition. Class attributes. Class fields. Creation of a particular class object. Abstract classes. Inheritance and interfaces. Syntax of interface. The concept and application of packages. The concept of exceptional situation in Java and its processing. Standard packages of Java programming system. Java - technologies.

**Real Time GIS.** Geoinformational real-time system (RT GIS). RT GIS architecture. System, functional and technical design of GIS. Methods and algorithms of routing in GIS. The concept of real time. Hardware design, analysis and development of the main RT GIS components. Development of input-output subsystems. Information converters in computer systems. Software development of RT computer systems. Information services organization of RT GIS. Processes scheduling. Simulation and optimization of information processes.

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**Computer networks designing in SCS.** Functions and features of network and transport levels protocols application in specialized computer systems. Basic network services of computer networks. Installation and setup of network services taking into account the requirements of security and information protection in SCS.

**Programing of Mobile Computer Systems.** Technologic platforms for implementation of mobile systems. Modern mobile OS. Fundamentals of mobile applications design and development. Data storage and processing in mobile applications. Information protection in mobile systems. Characteristics of mobile applications. Creating of applications based on Java ME.

**Development of Applications in modern OS.** Operating system Windows. Interaction of OS with the user programs. The structure of the application based on WinAPI. Application window. Processing of major program communications. Child windows of control. Development of user interfaces. Programming of the basic tasks of user applications development. Contexts of devices. Assignment of contexts, types of contexts. Main features and attributes of the contexts. Bitmap images. Keyboard programming. Focus keypad and messages. The use of child windows for application programming of modern user interface Using of multimedia timers. Development of dialogue system. Modal and non-modal dialogs.

**Bachelor**  
**Field of Knowledge «Information Technologies»**  
**in Specialty «CYBERSECURITY»**  
**Educational-professional program «CYBERSECURITY»**

Form of Training:	Licensed number of persons:
– Full-time	50
– Part-time	50
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian
Qualification	Information Security Officer

### **Concept of training**

The educational process of specialists training in the sphere of cybersecurity allows future professional to be grown up with the skill to be able to dynamically combine skills, knowledge, communicational skills and abilities with the individual work with responsibility during resolving the tasks and answering the problem questions in the sphere of informational security; forming the profound theoretical and practical background in the form of skills and knowledge to establish and grant the informational security on the objects of informational activities. The objects of the professional activities of graduates are the informatization objects, including computational, automated, telecommunication, informational, info-analytical, info-telecommunication systems, informational resources and technologies; technologies for granting the informational security; processes for informational and/or objects' cybersecurity control to be protected.

### **Practical training**

Practical training of students in the sphere of named specialty is aimed at mastering the basic methods and technologies for information security computer systems hardware and software developing.

### **Proposed Topics for Bachelor theses**

1. Development and organization of hardware and software facilities for information security and cybersecurity to resolve the domain-specific tasks.
2. Designing of systems for monitoring the unauthorized activities taking place in computer systems.
3. Development of system software for granting the information security in computer systems.
4. Development of hardware and software facilities for information security in computer systems.
5. Development of the facilities for increasing the cybersecurity of computer networks.



**Academic rights of Graduates:** graduates can apply for Master Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 of Section 1.3 of this Prospect.

### **Employment of Graduates**

In accordance with the current version of the National Classifier of Ukraine: the Occupational Classifier (DK 003: 2010) and the International Standard Classification of Occupations 2008 (ISCO-08), a graduate with the "Information Security Officer" professional qualification can be employed at enterprises and institutions of any ownership form, which work in the sphere of IT technologies, information-communication and telecommunication sectors.

Cybersecurity officers may hold the following primary positions: Software Engineer / QA Engineer; administrator of computer systems and networks; administrator of information and cybersecurity; safety auditor of information and communication systems; developer of information security facilities; engineer of information technical security service, etc.

**Bachelor`s Program and Curriculum  
in Specialty «Cybersecurity»  
Educational-professional program «Cybersecurity»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC1.	Higher mathematics	12	exam
CC2.	Physics	6	exam
CC3.	Programming	11	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1.	History of Ukrainian statehood	4	exam
OB 1.2.	Business protocol and communication ethics	4	exam
OB 1.3.	Economics and business	4	exam
OB 1.4.	Foreign Language	6	exam
OB 1.5.	Philosophy	4	exam
OB 1.6.	Plant growing and livestock breeding production technologies	4	exam
OB 1.7.	Legal culture of personality	4	exam
OB 1.8.	Information Technologies	6	exam
OB 1.9.	Physical Training	4	credit
<b>The volume of components of the general training cycle</b>		<b>69</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC4.	Methods and means of information security	5	exam
CC5.	Computer Logic	10	exam
CC6.	Complex information security systems	4	exam
CC7.	National information security	4	exam
CC8.	Fundamentals of information technical protection	4	exam
CC9.	Organizational support for information security	6	exam
CC10.	Component base and circuitry in information security systems	10	exam
CC11.	Information security risks theory	4	exam
CC12.	Information security in information and communication systems	4	exam
CC13.	Microcontrollers architecture and programming	8	exam
CC14.	Information security technologies	4	exam
CC15.	Cryptanalysis fundamentals	4	exam
CC16.	System programming	7	exam
CC17.	Computer networks	8	exam
CC18.	Cryptographic and steganographic information security fundamentals	4	exam
CC19.	Computer systems	3	exam
CC20.	Information security in computer systems	5	exam
CC21.	System software	8	exam
CC22.	Practical training	6	credit
CC23.	Preparation and defense of bachelor thesis	7	Bachelor`s Thesis
<b>Optional components</b>			
<b>Optional block 1 (student's choice)</b>			
<i>Optional block 1 «Information and communication systems security»</i>			
OB2.1.1.	Access control	4	exam
OB2.1.2.	System analysis	4	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB2.1.3.	Object-oriented programming	5	exam
OB2.1.4.	Licensing and certification of information security means	4	exam
OB2.1.5.	Secure network technologies of information processing	5	exam
OB2.1.6.	IT Systems operation and maintenance security	4	exam
OB2.1.7.	Cross-platform programming	4	exam
OB2.1.8.	Applications development and maintenance security	4	exam
OB2.1.9.	Educational programming practical training	6	credit
OB2.1.10.	Educational practical training in digital devices designing	6	credit
OB2.1.11.	Computer networks administration	5	exam
OB2.1.12.	Information security project management	4	exam
OB2.1.13.	Programming in the environment of modern OS	5	exam
<b>Optional Block 2 (student's choice)</b>			
<i>Optional Block 2 «Information security control»</i>			
OB2.2.1	Information security systems computer design technologies	4	exam
OB2.2.2.	Decision-making systems in the tasks of information security	4	exam
OB2.2.3.	Modern programming techniques	5	exam
OB2.2.4.	Wireless, mobile and cloud technologies security	4	exam
OB2.2.5.	Fundamentals of information security audit	5	exam
OB2.2.6.	Security architecture and models	4	exam
OB2.2.7.	Java programming	4	exam
OB2.2.8.	Information security incidents investigation	4	exam
OB2.2.9.	Computer technology practical training	6	credit
OB2.2.10.	Information security systems practical training	6	credit
OB2.2.11.	Web content management	5	exam
OB2.2.12.	Information security products and services	4	exam
OB2.2.13.	Applications development in modern OS	5	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>175</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Higher mathematics (parts 1 and 2).** The following topics are studied: Mathematical analysis. Complex numbers. Elementary functions. Continuity of functions. Derivative and differential functions. Functions analysis. Integrals. Functions of several variables. Function extreme. Series. Differential Equations. Ordinary differential equations of the first order. Cauchy problem. Linear algebra. Vector algebra. Analytic geometry. Systems of linear algebraic equations. Linear spaces and linear operators.

**Physics.** The following topics are studied: Mechanics. Kinematics and Dynamics. Models of classical mechanics. Work and energy. Basic theory of relativity. Electricity and magnetism. The electric field. Direct electric current. Alternating electric current. The magnetic field. Electromagnetic induction. Maxwell's equations. Optics. Wave optics. Interference. Diffraction. Polarization. Dispersion. Quantum physics. Thermal radiation. Photons. The model of the atom. Schrödinger equation. Elements of solid state physics.

**Programming – part 1.** In the first part of the “Programming” course the following topics are covered: Main concepts and problems of software development. Software life cycle; international standards of software life cycle. Models and methodologies of software development. Analysis, specification, verification and validation of the requirements to the software. Designing of software architecture. Software design patterns. Designing of user

interface. SADT, IDEF, DFD, ELM, OOAD modeling methodologies. Modeling languages. Behavioral modeling. State diagrams, activity diagrams, sequence diagrams, time diagrams. Structure modeling. Functional modeling. Data flows modeling.

**Programming – part 2.** In the second part of the “Programming” course the following topics are covered: Means of modeling automation. Project management tasks. Software project risks management. Control and monitoring of project status. Project team work management. Team members’ roles and roles and spheres of responsibility. Software quality; software quality standards. Software verification and validation. Software testing. Code optimization and refactoring. Software performance aspects. Integrated software development environments. Project management systems. Documents version control systems, architectural peculiarities. Instruments for project management automation. Instruments for testing processes automation.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

Annotations of the following disciplines: «History of Ukrainian Statehood», «Business Protocol and Communication Ethics», «Foreign Language», «Philosophy», «Physical Training», «Legal Culture of Personality», «Economy and business», «Plant Growing and Livestock Breeding production technologies»” – see Section 2.1.

**Information technologies.** The subject, methods and tasks of the discipline, theoretical fundamentals of informatics, system software for information processes, software tools for work with structured documents, network technologies, Internet usage in the economy, Web design fundamentals, organization of computer and information security, software tools for work with databases and data stores, office programming fundamentals, expert and training systems, information technology development prospects.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

**Methods and means of information security.** Getting started with the main physical principles, methods and means of information security and search for the equipment devoted to information obtaining. Study the methods and means of unauthorized obtaining of information, as well as the creation of counteraction to the protection of information through the channels where it is possible to lose the information.

**Computer Logic – part 1.** In the first part of "Computer Logic" course the following topics are considered: Key points and definitions of computer logic. Information basics of computer technics, for the tasks of information security and cybersecurity in particular. Switching functions algebra. Methods for switching functions minimization. Combinational schemes synthesis in various elemental bases. Fundamentals of the theory of digital automata with memory.

**Computer logic – part 2.** The second part of "Computer Logic" course deals with the following topics: Methods of digital devices with memory synthesis. Analysis of logic circuits and dynamic processes in digital automata. Typical digital circuits of computers. Introduction to the theory of numerical systems. Forms of numbers representation and encoding in computers. Fixed-point operations. Floating point operations. Operational automata synthesis. Digital automata as the basis for building the up-to-date information security and cybersecurity digital systems.

**Integrated information security systems.** Study of organizational and engineering-technical activities aimed at protecting information from disclosure, leakage and unauthorized access. Introduction to basic organizational activities for integrated information security systems, as well as engineering and technical activities. Learning the functional capabilities and methods of building integrated information security systems, mastering the necessary techniques and practical skills when configuring modern network equipment.

**National information security.** Information security is one of the essential components of the national security of the country. The discipline provides the methods, techniques, means, as well as the channels for the implementation of threats to national interests at the information level. The basic methods and means of timely detection, prevention and neutralization of threats for state information security are also studied. The goal of studying the "National information security" discipline is the formation of knowledge about the theoretical foundations of information security, especially the provision of information security of the state, the rules of the relation of information to state secrets, confidential information that is the property of the state, non-state confidential and open information that needs protection, ways of building information security systems.

**Organizational support for information security.** The role of organizational security of information in the system of security measures is determined by the timeliness and correctness of the management decisions taken, methods and techniques of information security on the basis of valid normative and methodological documents. Organizational methods of security include organizational, technical and legal activities, as well as include the following principles of information security: a scientific approach to the organization of information security; security planning; management of the security system; continuity of the information security process; the minimum sufficiency of providing the security; systematic approach to the organization and design of systems and methods of information security; integrated approach to information security organization; compliance with the level of protection of the value of information; security flexibility; multi-zonal security, which implies the placement of information sources in the areas with a controlled level of security; restriction of the number of persons that are allowed to get the access to secure information; personal responsibility of personnel for the maintenance of trusted information.

**Component base and circuitry in information security systems - part 1.** The following topics are considered: Schematic techniques of typical nodes and blocks. Fundamentals of computer circuitry. Typical nodes and blocks of digital technics. Triggers. Registers. Counters. Binary adders. Decoders. Multiplexers. Encoders. Memory devices. Random access memory. Register and buffer memory. Permanent memory. Circuitry of arithmetic devices. Adders variations. Structures of arithmetic devices of different function.

**Component base and circuitry in information security systems - part 2.** The following topics are considered: Variations and implementation of information transmission channels, protected channels in particular. Schematics of information security systems on Large-scale integrated circuits and Very large-scale integrated circuits.

**Information security risks theory.** Violation of the basic properties of information can be a serious threat to organizations at present. It is harder to control the information and it is exposed to a large number of threats and vulnerabilities, including computer fraud, espionage, sabotage, vandalism, fires or floods. Information resources, like material ones, are also characterized with quality and quantity, cost and price. Risk assessment is an important part of any information security process. It is used to determine the extent of threats to the security of information and the likelihood of a threat. The goal of "Information security risks theory" discipline is to study the process of risk assessment and assess the probability and potential damage from the identified threats, as well as develop the models for assessing the individual risk level of each information asset.

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**Information security in information and communication systems.** The discipline is the theoretical basis of the amount of knowledge and skills that form the profile of a specialist in the field of cybersecurity. On the basis of acquired knowledge and skills, a specialist will be able to solve professional problems based on modern technologies and methods of information security in modern information and communication systems and networks. The purpose of teaching the discipline is to disclose the modern methods of information security in computer systems and networks and familiarization with the peculiarities of hardware and software implementations of these methods. The discipline involves the study of the following constituents: types of information threats in computer systems and networks; basic security protocols; principles of security systems operation; main means of software and hardware protection of information in computer systems and networks; methods of unauthorized information retrieval and deliberate damage of information and means to counter these attempts.

**Microcontrollers architecture and programming - part 1.** The purpose of teaching the discipline (Part-1) is to familiarize the students with modern tools for embedded software for microcontrollers developing. Study the architecture of modern microcontrollers. Study of the possibilities and areas of microcontrollers usage in information security and cybersecurity systems.

**Microcontrollers architecture and programming - part 2.** The purpose of teaching the discipline (Part-2) is the acquisition of experience in developing the software for modern microcontrollers. The main tasks of studying the discipline are the acquisition of skills for working with technical documentation for modern microcontrollers and electronic components in information security systems and cybersecurity. Acquisition of the skills in the sphere of embedded software development.

**Information security technologies.** The discipline helps to prepare future specialists for the effective use of modern information technologies in the process of data security problems solving and digital information protection. The tasks of "Information security technologies" discipline are the following: acquisition of knowledge, skills and abilities on the topic of the fundamentals of information protection and skills of their practical application when working with modern software acquisition; techniques of information security implementation in information systems; modern means of human interaction with hardware and software; fundamentals of data crypto protection; techniques of important information protection from the unauthorized access.

**Cryptanalysis fundamentals.** The discipline is aimed at providing the students with the knowledge in the field of theoretical cryptography and cryptanalysis. The discipline introduces the main principles of the work of crypto analysts, the mathematical models of the information sources, theoretical and practical secrecy concepts, as well as practical methods of cryptanalyst work.

**System programming - part 1.** The goal of the first part of "System programming" course is to provide students with the knowledge and skills of working with the Assembler language, as a mean of effective programming, study the architecture and the system of commands of the base processor, subroutines creation in the Assembler language.

**System programming - part 2.** The goal of the second part of "System programming" discipline is to provide students with the knowledge and skills of constructing system programs, creation of system programs using C and C++ languages. Studying the discipline, the following topics are covered in particular: technologies for the development of multi-component system programs, the use of software libraries, processing of data structures in system programs. The questions of code optimization of system software products for the tasks of information security and cybersecurity.

**Computer networks - part 1.** The goal of the first part of "Computer networks" discipline is to provide students with the knowledge and basic skills related to the theoretical and practical aspects, as well as the methodology of design, construction and the usage of computer networks.

**Computer networks - part 2.** The goal of the second part of "Computer networks" discipline is to provide students with the knowledge about the architecture of modern computer networks, software for network configuration, acquiring practical skills for analyzing the protection of networks from unauthorized access to information.

**Cryptographic and steganographic information security fundamentals.** The discipline teaches students about classical and modern symmetric cryptographic systems, open key cryptography, various cryptographic protocols and their applications, as well as new promising directions for the development of cryptology. The discipline aims to give students the knowledge in the field of theoretical cryptography and steganography. Discipline introduces the main principles of cryptographers work, mathematical models of information sources. Specific types of encryption algorithms and cryptographic transformations are considered according to their classification into classical schemes, streaming systems, block encryption systems, and public key information security systems. Much attention is paid to cryptographic protocols and their application in the sphere of modern information technologies security.

**Computer systems.** The discipline is devoted to consideration of the following issues: Structure, principles of creation and classification of computer systems (CS). Subject, tasks and methods of CS theory. Computational processes in the CS and corresponding models. Works planning in the CS. Metrics of the CS: productivity, efficiency, reliability. The structural organization of the CS of different generations. Classification of parallel CS. CS with a fixed system of connections. CS with reconfigured system of connections. Memory organization in the CS. Organization of I/O in the CS. Data transmission organization in the CS. CS of SISD class. CS of SIMD class: matrix, vector, associative. CS of MISD class: conveyor computer systems. CS of MIMD class: multiprocessor, multicomputer, systems with heterogeneous access to RAM, cluster systems, GRID systems. Computer systems with unconventional architecture. CS interfaces. Basic concepts of CS fault-tolerance. Structural aspects of building a fault-tolerant CS. The place of computer systems in integrated design, production and operation systems. Connection of computer systems with other automated systems. Organization and construction methodology of modern software and hardware complexes, in particular the ones related to the protection of information and cybersecurity. Examples of modern design and engineering systems. The structure of engineering analysis systems for the protection of information and cybersecurity. Types of computer systems to protect information and provide cybersecurity of objects of information.

**Information security in computer systems.** The discipline deals with the main principles and decisions in the design and implementation of information security and cybersecurity systems in specialized computer and robotic technical systems and networks. The purpose of the discipline is to provide students with the necessary knowledge about cybernetic threats to specialized computer and robotic technical systems and networks. Introduction to main methods, principles, algorithms of information security in computer systems, taking into account the current state and forecast of the development of methods, systems and means of implementation of threats and cyber-attacks from the side of potential violators. During the study of the discipline students are expected to have certain knowledge and skills in the theory and practice of information protection and information security in specialized computer and robotic-technical systems and networks.

**System software - part 1.** The goal of studying the "System software" (Part 1) discipline – to train the specialists for the effective use of modern computer technics in order to optimally use it in the tasks of information security and cybersecurity, gaining the

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skills of working with Windows operating systems (OS) for installation and proper administration of the OS on personal computers and servers, in the work with packages of applications and additional software shells, etc.

**System software - part 2.** Part 2 of the "System software" course covers the topics related to Unix/Linux operating systems developing to install and fully administer OS on personal computers and servers.

### **Optional components**

#### ***Optional Block 1 «Information and communication systems security»***

**Access control.** Modern information and computer systems are vulnerable to a number of network threats that may be the result of unauthorized access, as well as the disclosure or modification of information. In order to protect relevant information resources from cyber threats, it is necessary to apply targeted access control means. This discipline is devoted to the study and mastering of the guiding and general principles of designing, implementation, support and improvement of the access control and information protection system. Students acquire practical skills in planning and developing of effective access control system that provides management and control of access, development and maintenance of hardware-software systems and networks; management of continuity of business-processes and management processes optimization. Students learn to identify the specific security risks that threaten the resources of the organization and for which the vulnerability, likelihood of its occurrence and potential impact are assessed; develop the security policy; to organize the management of assets and resources in order to increase the efficiency of the operation and security of computer systems.

**System analysis.** Goal: to develop students' skills in system thinking and prepare them for solving practical problems of analysis and synthesis of information security, information and (or) cybersecurity systems. Objective: to study the methodology of the system approach, widely used in solving global and special problems such as monitoring, management of technological processes, information systems, technical diagnostics, etc.

**Object-oriented programming.** Classes and objects in C++. Fields and class methods. Variants of syntax and class description structure. Encapsulation through access specifiers. Address to an object through a pointer. Class constructor. Standard initialization lists. Destructors. Copy constructors. Transfer constructor. Static class members, constants. Friend functions, friend classes. Embedded classes. Inheritance as a key point in OOP. Usage Scenarios. Delegation and inheritance of constructors. Changes of the level of access to class members in different inheritance scenarios. Multiple inheritance. Concept of polymorphism, advantages and disadvantages, alternatives. Virtual functions as the basis of polymorphism in C++. Research on the implementation of polymorphism in C++. Abstract classes. Concept of the interface in the OOP. Virtual destructors. Exceptions processing. Exception-objects, variants of exceptions catch, use of polymorphism. Exceptions limitation. The concept of a template in C ++ (template). Template functions and template classes. Elements of metaprogramming.

**Licensing and certification of information security means.** The goal of studying the discipline is the formation of knowledge about the organization of the state licensing system in the field of information security, certification of information security objects, as well as organization of the activities on information security at the object of informatization and their legal support. The discipline reveals the basic concepts and types of information that is protected in accordance with the legislation of Ukraine, gives knowledge about the system of protection of state secrets, confidential information, forms the professional competencies necessary for the professional activity. Objectives of studying the discipline: study the information legislation of Ukraine and international legislation in the field of

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information security; formation of knowledge in the field of organization of state licensing in the field of information security; development of the skills of organization of the system of certification and attestation of objects of informatization.

**Secure network technologies of information processing.** The purpose of studying the discipline is the formation of knowledge about the basic methods and means of protection of information resources, in particular, the technologies of identification, authentication and access control in computer networks and systems; the principles of multi-level protection of the corporate network, integrated with the networks of general access, for example, the Internet; firewalls; the concept of building virtual secure VPNs.

**IT systems operation and maintenance security.** The theory of reliability and efficiency of computer systems and software in terms of restorative and non-renewable objects, in particular after events related to cyber incidents, is studied. The indicators of reliability, durability and storage of elements and systems, complex indicators of reliability are considered. The methods of construction of structural schemes of reliability and failure trees are studied. The methods of estimating the reliability of systems without restoration and with restoration, with reservation are considered. The basic concepts of technical diagnostics, principles of organization of systems of technical diagnostics and the use of automated diagnostic systems are studied.

**Cross-platform programming.** The purpose of teaching the "Cross-platform programming" subject is to provide students with the theoretical knowledge and practical skills of component programming, the principles of the technology of developing cross-platform software systems, the principles of using cross-platform programming tools. Themes: architecture and standards of component models, communication tools and distributed computing; integration strategies of software components; main intermediate platform and component models; formal and visual methods of components construction; development of requirements and specifications of the components of information systems and objects of professional activity; design of software components; design of the human-machine interface of information systems; integration of components into the system.

**Applications development and maintenance security.** The purpose of the discipline is to study the means and methods of information security and security for the uninterrupted and efficient use of programs and data in various computerized systems, modern methods of data development and support, and promising algorithmic methods for protecting programs and data.

**Computer networks administration.** The goal of the discipline is to study the fundamentals of theory and to acquire practical skills in network administration of the information system of an organization - management of network nodes, network protocols, directory services, network services, file system resources management, rights of access to resources, printers, backup and restore systems, network devices and services monitoring.

**Information security project management.** The goal of the discipline is to create a solid knowledge system for students in acquiring the skills in managing information security projects at the enterprise, institution, industry, region and country level. During the course students will get acquainted with: modern methods and technologies for managing information security projects and project management site in the general information security management system. The following topics are covered: history of development, accumulated experience and state of management of information security projects in Ukraine and in the world; the content and structure of the information security project, its life cycle; theory of organization of project management information security. The result of discipline study is the formation of competences of effective information security projects management.

**Programming in the environment of modern OS.** The following topics are considered: programming in the modern OS environment (Linux, MacOS, Android), taking into account their structure, functions, positions in relation to multithreaded data processing; multi-threaded programming in high-level languages, with the use of modern integrated development tools.

### ***Optional Block 2 «Information security control»***

**Information security systems computer design technologies.** The goal of studying the discipline is the formation of knowledge about the basic methods and technologies of automated modelling, designing and researching the information security systems. The technologies of designing computerized cybersecurity and information security systems for real security objects are studied. The object-oriented design and design of cyber security and information security systems, components of P-CAD, examples of the synthesis of information security systems in P-CAD are studied.

**Decision-making systems in the tasks of information security.** The goal of the discipline is to familiarize with the national programs and areas of informatization of information security and cybersecurity systems, to form a systematic approach to the analysis of the current state and trends of decision support systems in the tasks of cybersecurity of information objects, to study the methodology for determining the strategic and operational orientation of decision support systems in the tasks of information security and cybersecurity, study the theoretical aspects of implementation in the organization of the decision support system, including information security, and forming the complex information security systems based on compatible hardware and software systems with the use of artificial intelligence technologies.

**Modern programming technologies.** As a result of studying this discipline, the student acquires the knowledge and practical skills in modern programming technologies usage in the environment of Windows and Linux operating systems. Object-oriented programming tasks (OOP), threads usage, work with DLL for granting information and cybersecurity of information objects are studied.

**Wireless, mobile and cloud technologies security.** Modern information and communication technologies foresee the use of virtualization technologies for server systems technologies, communication tools for distributed computing, and the development of software for hardware solutions for data centres. To manage cybersecurity of heterogeneous computing resources remotely, software and hardware solutions are required for secure implementation of virtualization systems as well as remote service functions, which in general creates opportunities for the organization and use of wireless, mobile and cloud computing technologies. The goal of teaching discipline is the formation of theoretical knowledge and acquisition of practical skills in the sphere of distributed computing technologies, virtualization of server systems, designing of secure corporate computing systems with the use of wireless, mobile and cloud computing.

**Fundamentals of information security audit.** The "Fundamentals of information security audit" discipline studies the systemic process of obtaining objective qualitative and quantitative assessments of the current state of security of the information system or information and telecommunication system, and also allows to conduct a comprehensive assessment of the level of information security of the customer's information objects, taking into account the following main factors: personnel, processes and technologies. A comparative analysis of the current state of the information system, which is determined by the results of the questionnaire, with the test model of the requirements of ISO 27001 standard.

The need for a regular information security audit is about assessing the real state of the security of IS and/or ITS resources and their ability to withstand external and internal

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threats to information security that are constantly changing and adapting. The State Ukrainian Enterprise "Ukrainian Special Systems" proposes to conduct an audit of information security at the objects of information activity of the Customer, with the purpose of determining the state of protection of IS and/or ITS, by means of which the confidential or other critical information of the Client is processed, as well as the compliance of IP and/or ITS with the standards and regulatory documents in the public or commercial sector.

**Security architecture and models.** The course is based on modern cybersecurity and information security practices, including the Business Model for Information Security (BMIS). During the study of discipline, the components of BMIS (organization, people, technologies, processes) and the dynamic interrelationships between them (information technologies, architecture of systems of different purposes, culture, management, human factor) are considered and analysed in detail. The models of identification of the current status of information and cybersecurity. Methods and models of information security assessment of the organization, Threat and Risk Assessment (TRA) in particular. The approaches to determine the factors that affect the state of information security; methods of determining the degree of interconnection between factors and their impact on the state of information and cybersecurity of the enterprise. Possible approaches to the assessment of the adequacy of information and cybersecurity models obtained are considered; simulation of possible scenarios for changing the information and cyber security of the organization.

**Java Programing.** The goal of the discipline is to provide the students with the practical skills to create applications in the Java language. The task of the discipline is to familiarize students with the peculiarities of programming in Java and gain the experience in Java applications creation. Discipline subject - the principles of creating different types of applications in Java. Upon completion of the discipline, students must have a certain level of knowledge of the Java programming language, understand the features of creating Java applications. Students must be able to apply the skills acquired to solve the tasks of designing cross-platform applications and developing Web applications using applets and servlets.

**Information security incidents investigation.** In order to process information security incidents, an incident response process must be organized. The "Information security incidents investigation" discipline acquaints students: with the methodology of organizing the process of responding to IS incidents; methods of providing coordination of response to an incident; means of confirmation / refutation of the fact of the incident of the IS; methods of minimization of violations of the order of work and damage to the IT system, methods of restoration in the shortest possible time of the organization's operation in case of its violation as a result of the incident and minimize the consequences of violating the confidentiality, integrity and availability of IT information. The main approaches to creating the conditions for protecting the reputation of the organization and its resources are also studied; the rapid detection and/or prevention of such incidents in the future; methods of company personnel training to identify, eliminate the consequences and prevent IS incidents, and inform the management about the state of information security in a timely manner.

**Web content management.** The discipline addresses electronic document management systems and corporate web content management systems that provide effective information management through its secure storage and access organization. These systems are the basis for the implementation of corporate content management and knowledge management strategies at the enterprise, which ensures its innovative development.

**Information security products and services.** The purpose of "Information security products and services" discipline is to provide the students with the knowledge and skills to conduct the information system penetration test, which is the best way to assess the security of the information system as a whole, to identify individual vulnerabilities and to check the reliability of the existing mechanisms for protecting the information system from unauthorized influence, using different models of violators. During the study of discipline the following topics are covered: methods for assessing the current state of information security; the method of identifying the information system vulnerabilities with their ranking on the degree of criticality; requirements of international standards and legislation; a methodology for developing recommendations for improving the effectiveness of protection; a methodology to provide the client with an independent assessment of the selected information protection measures; methodology of data preparation for complex audit of information security of the object of informatization.

**Applications development in modern OS.** The goal of the discipline "Applications development in modern OS" is the formation of knowledge and skills of programming in the environment of modern OS (Linux, MacOS, Android), taking into account their structure, functions, positions in relation to multi-threaded data processing. Studying the discipline, students receive multi-threaded programming skills in high-level languages, with the use of modern integrated development tools, learn about the aspects of the use of data containers, the skills for web applications creation in particular.

## 2.16. HUMANITARIAN PEDAGOGICAL FACULTY

**Dean** – Doctor of Philology, Professor **Shynkaruk Vasyl Dmytrovych**

Tel.: (044) 527-80-83 E-mail: pedagogy\_dean@twin.nubip.edu.ua

Location: Building № 3, Room 101

The faculty organizes and coordinates the educational process of bachelors in the following specialties:

### **231 Social Work**

Educational-professional Program «**Social Work**»

Graduating Department:

Department of Social Work and Information Technologies in Education

Tel.: (044) 527-83-57 E-mail: socpedagogy@ukr.net

Head of department – Doctor of Pedagogy, Associate Professor Victorova Lesya Victorivna

### **035 Phylology (German)**

Educational-professional Program «**Phylology (German)**»

Graduating Department:

Foreign Philology and Translation

Tel.: (044) 527-88-46 E-mail: kifip@ukr.net

Head of department – Doctor of Pedagogy, Professor Amelina Svitlana Mykolaivna

### **035 Phylology (English)**

Educational-professional Program «**Phylology (English)**»

Graduating Department:

Romano-Germanic languages and translation

Tel.: (044) 527-85-95 E-mail: krgm@ukr.net

Head of department – Doctor of Pedagogy, Professor Malyhin Oleksandr Volodymyrivych

### **291 International relations, social communications and regional studios**

Educational-professional Program «**International relations, social communications and regional studios**»

Graduating Department:

Department of International Relations and Social Sciences

Tel.: (044) 527-81-16 E-mail: kaf\_ist\_pol@ukr.net

Head of department – Doctor of History, Professor Bilan Serhii Oleksiiovych

**015 Professional Education (Technology of production and processing of agricultural products)**

Educational-professional Program «**Professional Education (Technology of production and processing of agricultural products)**»

Graduating Department:

Pedagogy

Tel.: (044) 527 - 83 - 55 E-mail: pedagogic@ukr.net

Head of department – Doctor of Pedagogy, Associate Professor Sopivnyk Ruslan Vasylovych

**061 Journalism**

Educational-professional Program «**Journalism**»

Graduating Department:

Department of Journalism and Linguistic Communication

Tel.: (044) 527 - 83 - 63 E-mail: ukr\_eng\_kaf@ukr.net

Head of department – Doctor of Pedagogy, Professor Kostrytsia Nataliia Mykolaivna

**053 Psychology**

Educational-professional Program «**Psychology**»

Graduating Department:

Department of Psychology

Tel.: (067) 6965370 E-mail: shmargun2012@ukr.net

Head of department – Head of the Department – Doctor in psychology, Professor Shmargun Vitaly

**Bachelor**  
**Field of knowledge “Social work”**  
**in specialty “SOCIAL WORK”**  
**Educational-professional program «Social Work»**

Form of education:	Licensed number of persons:
– full-time	50
– extra-mural	50
Duration of studying:	
- Full-time	4 years
- extra-mural	5 years
Credits	240 ECTS
Language of teaching	Ukrainian, English
Qualification of graduates	Bachelor Social work

**Conception of Training**

Training of social teacher is caused by the need of our state in specialists which perform a job directed on social-pedagogical help, support, defense and rehabilitation of all categories of children and youth in rural area. Professional activity of this specialist is supposed to be directed on solving of production questions in directions of learning social-pedagogical problems concerning of socialization of fosterling children and youth, organization of their public defense, performing of consulting in social-pedagogical questions, organization of their leisure time, giving help in the process of education to persons which have direct relationship to it.

**Practical training**

Practical training is performed according to the schedule of educational process directly at the licensed bases of practice, between them: regional center of social service for families, children and youth; departments which work with children of the street; educational-healthcare complexes; territorial centers of social servicing; pre-school educational institutions; general schools of I-III levels; centers of social-psychological rehabilitation.

**Academic rights of Graduates:** graduates can apply for Master’s Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

Social teacher may work at the system of educational institutions, houses and centers of children’s education, cultural centers and schools of fine arts, social-educational services and clubs, children’s and public organizations, services of keeping, department of juvenile services, center of social defense and help, employment centers and job connections.

**Bachelor`s Program and Curriculum  
in Specialty “Social Work”  
Educational-professional program «Social Work»**

№	Components of Educational and professional program (Academic disciplines, course project (works) practices, Qualification work)	Credits ECTS	The final control
1	2	3	4
<b>1. CYCLE OF GENERAL TRAINING</b>			
<b>Required components</b>			
RC 1	Valeology and age physiology	6	Exam
RC 2	Computer technology in social work	4	Exam
RC 3	Psychology of personality	7	Exam
RC 4	Introduction into specialty	6	Test, Exam
RC 5	Keeping professional documents	4	Exam
RC 6	Social insurance and retirement securement	6	Exam
RC 7	Social and communicational technologies	4	Exam
RC 8	Basics of consultation	4	Exam
RC 9	System of organiosation and management of social service	4	Exam
RC 10	Basics of scientific researches	4	Exam
RC 11	Technology work of social Hoverner	4	Exam
RC 12	History of social work	4	Exam
RC 13	Theory and history of social education	4	Exam
<b>Elective components</b>			
<b><i>Elective bloc 1 (offered by University)</i></b>			
EB 1.1	Foreign language	16	Test, Exam
EB 1.2	History of Ukrainian statehood	4	Exam
EB 1.3	Safety in work and life	4	Exam
<b><i>Elective bloc 2 (offered by students)</i></b>			
EB 2.1	Civil and family law	7	Exam
	Jurisprudence		
EB 2.2	Polish language	4	Test, Exam
	Comparative pedagogics		
EB 2.3	Latin language	4	Exam
	Statistics and society		
EB 2.4	Advertising and informational technologies	4	Test, Exam
	Basics of public relations in social work		
EB 2.5	Basics of defectology and pathopsychology	4	Exam
	Basics of special pedagogics and psychology		
Total cycle components of general training			
<b>2. CYCLE OF SPECIAL (PROFESSIONAL) TRAINING</b>			
<b>Required components</b>			
RC 14	General and social psychology	4	Exam
RC 15	Basics of general and social pedagogics	6	Test, Exam
RC 16	Basics of giving social services	8	Test, Exam
RC 17	Social work with families, children and youth	4	Exam
RC 18	Volunteer preparation and organization	4	Exam
RC 19	Management of social work	6	Exam
RC 20	Theory of social work	6	Test, Exam
RC 21	Social work with different groups of clients	4	Exam
RC 22	Social work in penitentiary system organizations	6	Test, Exam
RC 23	Workshop with social work	4	Exam
RC 24	Social family support	5	Exam
RC 25	Individual socialization	5	Exam
RC 26	Technology of social work	4	Exam
RC 27	Informational and communicational technologies in social and pedagogicals activities	4	Exam



<b>Elective components</b>			
<i>Elective bloc 1 (offered by University)</i>			
EB 1.4	Ukrainian for professional purposes	4	Exam
EB 1.5	Physical training	4	Test
EB 1.6	Philosophy	6	Exam
<i>Elective bloc 2 (offered by students)</i>			
EB 2.6	Social work in the field of leisure	4	Exam
	Basics of scenario work		
EB 2.7	Basics of inclusive education	5	Exam
	Social gerontology		
EB 2.8	Cohesion group training	4	Exam
	Social diagnostics		
EB 2.9	Methods of social work	4	Exam
	Leadership		
EB 2.10	Organization of social insurance	7	Exam
	Preventional pedagogics		
EB 2.11	Reabilitational work of a social worker with people with disabilities	6	Exam
	Social therapy problems of an individual and group		
<b>Total cycle of special (professional) training</b>			
<b>3. OTHER TYPES OF TRAINING</b>			
RC 27	Military training course		
RC 28	Cultural and educational training		
RC 29	Educational (profession acquaintance) workshop	2	
RC 30	Educational (volunteer acquaintance) workshop	3	
RC 31	Educational workshop	2	
RC 32	Productive workshop	5	
RC 33	Productive (pre-graduation) workshop	5	
RC 34	State Attestation	1	
<b>Total educational professional program</b>		<b>240</b>	

## Annotations of components in the curriculum

### 1. CYCLE OF GENERAL TRAINING

#### Required components

**Valeology and age physiology.** General patterns of growth and development of children and adolescents; structural and functional characteristics of human organs and systems in the age aspect; components and factors of a healthy lifestyle; patterns and features of the influence of society, which determine the health of modern man.

Wellness worldview. Healthy lifestyle. Mechanisms of the organization of vital activity on the principles of a healthy lifestyle.

**Computer technology in social work.** The evolution of information technology. Characteristics and classification of computer equipment. Architecture and principles of the PC. The technology works in an environment of graphical operating systems. Technology for creating, editing and displaying electronic presentations. Formalization and algorithmization of computational processes. Technology for creating, editing and formatting spreadsheets, diagrams, text documents. User interface and Internet technology.

**Psychology of personality.** The study of the mental properties of a person as a holistic education, defined by the system of mental qualities, has a corresponding structure, internal connections, is characterized by individuality and is interconnected with the surrounding natural and social environment.

**Introduction into specialty.** Social work as a science, its object, subject, structure, methods of knowledge, functions, place among other social science disciplines, the main stages of development; concept of society as a whole, social development; culture as a mechanism for regulating society. Man in a social context.

**Keeping professional documents.** The history of the formation and development of documentation. Modern requirements for the preparation and execution of documents. Classification of business papers. Rules of material presentation and logical construction of the text of the document.

Registration, basic requisites of organizational, administrative, documentation on personnel, reference and information, economic and contractual and accounting and financial documentation.

Writing and execution of documents of a social teacher/work.

**Social insurance and retirement securement.** Legislation on social insurance. The history of the emergence and development of social insurance in Ukraine. Mandatory state social insurance. Types of compulsory state social insurance. Voluntary social insurance. The system of rights, obligations and guarantees, providing for the provision of social protection.

Regulatory documents, legislation on pensions.

**Social and communicational technologies.** Social communication: starting line. The concept and types of social communication technology modeling of social space. Cognitive schemes in the social space of a specialist

**Basics of consultation.** The concept of counseling. The purpose and objectives of the advisory work. Character and objectives of counseling, Categories of professionalism and culture of counseling. Management consulting. Modeling the process of management consulting. Methods of counseling. The scope of the sociologist as a consultant

**System of organization and management of social service.** Forms and methods of organization formation; the functions of social services, the legal framework for the activities of social services, their relationship with state and public organizations. The nature and objectives of management consulting, types of consulting organizations. Management information support; cadres of social management.

**Basics of scientific researches.** Science and scientific thinking. The ability to determine the direction of the scientific result in solving problems and the implementation of the functions of science. The main categories of science. Ability to formulate and justify the scientific hypothesis. Scientific research. Ability to conduct scientific research. Technology work with the scientific literature. Ability to analyze scientific publications. System approach and system analysis. The ability to conduct a systematic analysis of the subject area of scientific research. Methods of working with concepts. Ability to formulate definitions of concepts of the studied subject area. Organization of research work of students. Ability to effectively organize research activities.

**Technology work of social Hoverer.** The role of social tutor in society, the social significance of its activities in the context of the introduction of inclusive education. The content of the main technologies that are produced by modern socio-pedagogical and psychological sciences and the practice of working with children with disabilities. The methods of social tutor's work with children under various disabilities.

**History of social work.** The origin and development of social work from ancient times to the XVIII century. Social work in the XIX-early XX centuries. Features of social work in the twentieth century. The organization of social work at the present stage.

**Theory and history of social education.** The development of the theory and practice of social education from ancient times to modern times.

**Elective components*****Elective bloc 1 (offered by University)***

**Foreign language.** Phonetic norms of a foreign language. Listening and speech. The lexical minimum (categories of being, their properties and relations; geographical, demographic, economic and political data) of a particular country of the world under study. The lexical minimum of regional and social differences between Ukraine and the country whose language is being studied. Introductory and exploratory reading at a certain speed without a dictionary. Learning to read with a certain number of unknown words (using a dictionary). Abbreviations of foreign professional terms in a particular profession-oriented industry. The structure of the dialogue of a general scientific nature. Features of the dialogue of professional-oriented nature. The lexical minimum of business contacts, business meetings, meetings. Speech communication etiquette. Elements of interpretation of information in a foreign language in the process of business contacts, business meetings, meetings.

Foreign language features of business correspondence: vocabulary, grammar, syntax, business etiquette, cultural aspect. Professionally-oriented foreign language sources. Methods of searching for new information in foreign sources. Linguistic methods of analytical processing of foreign sources. The study of printed foreign language original literature and the expansion of lexical and grammatical skills. Methods and linguistic features of annotation and abstracting of foreign sources. Electronic foreign language sources. Search for information on the Internet by the method of keywords. Basics of translation of professional-oriented foreign language sources. Computer translation of large amounts of foreign language information. Lexical minimum of computer (information) technologies.

**History of Ukrainian statehood.** The phenomenon of Ukrainian statehood. Prehistoric period in the history of Ukraine. Ukraine-Rus (9th century - first half of the 14th century). Lithuanian-Polish period of Ukrainian history (the second half of the 14th century - the first half of the 17th century). Cossacks in the history of Ukraine (second half of the XV-XVIII centuries). Ukraine under the rule of the Russian and Austro-Hungarian empires at the end of the XVIII century. - early XX century. The struggle for the revival of the statehood of Ukraine (1917-1920 pp.). Ukraine in the conditions of formation of the communist regime. Ukraine in World War II and the first post-war decade. Ukraine in the 60s-80s of the 20th century The development of an independent Ukraine.

**Safety in work and life.** The scientific basis of life safety. Physiological and psychological criteria for human security. Basics of valeology. Emergency care in case of accidents. Hazardous environmental factors. The environment of human life. Negative electrical and electromagnetic factors. Global security. Global problems of mankind. Food safety.

***Elective bloc 2 (offered by students)***

**Civil and family law.** The concept of civil law of Ukraine, its subject and methods of legal regulation. Sources of civil law of Ukraine. Trends in the development of civil legislation of Ukraine. The concept, classification, content, grounds for the emergence and termination of civil relations. Subjects and objects of civil relations, their types. Features and procedures for the implementation and protection of civil rights and obligations. The concept and types of transactions.

**Jurisprudence.** Theory of State and Law. General provisions of administrative law as a branch of law. Civil law as a branch of law. General provisions of the law of obligations. Fulfillment of obligations and liability for their violation. Separate types of contracts. The concept, sources and subjects of labor law of Ukraine, Remuneration,

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working time and rest time. Labor disputes and the order of their resolution. Material liability. Family law. Social security and social insurance under the laws of Ukraine. Consideration of civil cases in courts of law. Criminal law of Ukraine as a branch of law.

**Polish language.** Orthoepy, phonetics, spelling, grammar - inflection system, structure of syntactic structures; training in the aspect of the development of dialogic and monologue speech. The specificity of Polish customs, traditions, culture.

**Comparative pedagogics.** General provisions of comparative pedagogy. International cooperation in education. Features of preschool education in different countries. Features of school, higher education and adult education in different countries of the world. Factors and strategies for reforming education.

**Latin language.** Formation of knowledge on the basics of the Latin language, the formation of skills and skills of translating Latin texts and the use of Latin-language terminology in educational, scientific and industrial activities.

**Statistics and society.** The subject and tasks of social statistics. Society as a social system. Population as an object of social statistics. Statistics of living standards of the population. Statistics of housing conditions and housing services. Statistics of the external environment. Statistics of health care and education services. Statistics of informatization. Statistics of culture, art and recreation. Statistics of social protection of the population.

**Advertising and informational technologies.** The main directions, principles of development, production, placement and functioning of social advertising as a type of communication.

**Basics of public relations in social work.** The essence, principles, regulatory, ethical principles of public relations (PR) as a sphere of professional activity, organizational and psychological conditions for their effectiveness, the role in ensuring the functioning of the company (organization). The main methods of pseudo-technology PR ("black PR") and the possibility of countering them.

**Basics of defectology and pathopsychology.** Disturbance of consciousness and self-awareness. Principles of building a pathopsychological examination. Disturbance of attention, sensation, perception. Memory impairment Violation of thinking. Emotional-volitional disorders. Neurotic disorders. Endogenous psychoses. Reactive psychosis. Mental retardation. Mental development disorders.

**Basics of special pedagogics and psychology.** Systems of special educational services. Special educational institutions for children in need of correction of psychophysical development. Basic concepts of special pedagogy. Features and patterns of development of various categories of persons with mental and physical disabilities, completing educational institutions for them. The legal framework of modern special education in Ukraine.

## 2. CYCLE OF SPECIAL (PROFESSIONAL) TRAINING

### Required components

**General and social psychology.** Modern ideas about the psyche, the fundamental statements of psychological science of the laws of mental processes, mental activity, emotional-volitional sphere, individual-typological personality traits, features of the organization and functioning of small groups and teams, the dynamics of interpersonal relationships.

**Basics of general and social pedagogics.** Social personality formation; social environment as an object and subject of social and pedagogical influence; social and pedagogical problems of certain categories of the population; sociopedagogy of sociocultural sphere; history and prospects of social education.

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**Basics of giving social services.** Normative legal acts and international treaties of Ukraine regarding the provision of social services. The complex of legal, economic, psychological, educational, medical, rehabilitation and other activities aimed at specific social groups or individuals who are in difficult life circumstances and need outsiders. Subjects providing social services. Basic principles and principles of social services. Types of social services and forms of their provision. Social service.

**Social work with families, children and youth.** Basic principles of social work with families, children and young people. The effectiveness of the implementation of the main goals and objectives of social work with families, children and young people. Relevant forms and methods of working with families, children and young people. The main directions of social work with families, children and youth.

**Volunteer preparation and organization.** Volunteer assistance is one of the important methods of voluntary social work. The main approaches to volunteer assistance. Volunteering is a tool for social, cultural, economic and environmental development. An organized and managed process for the participation of people in the activities of state authorized authorities in various non-governmental organizations and institutions of the third sector. Stages of training volunteers. Volunteer motivation levels.

**Management of social work.** Functions of social work management, principles and laws. Labor resources, motivational theories of labor activity. Project Management. Leadership styles in the relevant situation, methods of conflict resolution. Organization and coordination of social work with various categories of clients.

**Theory of social work.** Historical reconstruction of the institutionalization of social work as a holistic process. Stages of development of social work in world history. Approaches to the description of reality in the social sciences and the theory of social work. The main components of the structure of the theory of social knowledge. Social work as: a multilevel theory, paradigmatic theory, integrative. Social work in the context of modern scientific paradigms. The main discourses in social work. Concepts of social functioning in the theory of social work. Crisis and task-centered theory of social work.

**Social work with different groups of clients.** Formation of social work with various groups of clients. Social work with pre-conscription and conscription youth, military personnel and members of their families; low-income groups. Social assistance and support for persons with disabilities. The system of social assistance to the elderly and lonely. Social work with people who have alcohol and drug problems. Social work with sex workers. Features of social work with HIV-infected and AIDS patients. Organization of work with people without a certain place of residence. Social work with groups of clients subjected to violence in the family. Organization of work with victims of "human trafficking". The specifics of social work with people of suicidal behavior. Organization of social support for persons returning from places of detention. Social work with families with children with special needs. Social work with young people and young families. Social work with children who were left without parental care. Social work with street children.

**Social work in penitentiary system organizations.** Historical background of the formation and development of the penitentiary institution. Conceptual bases of a penitentiary institution in the work of a social worker. Psychological and pedagogical activities of the bodies performing the punishment. The activities of social workers in the penitentiary sphere. The main methods and techniques of social work in the penitentiary system. Socio-psychological methods of influence on group behavior. Interactive forms of social work as a central idea of the penitentiary policy. Psychoanalytic methods and techniques of penitentiary psychology. Diagnosis of informal interaction and the place of the individual in the subculture. Features of social work with minors who are returning from prison.

**Workshop with social work.** The professional position of a social worker; the specifics of social work and its humanistic orientation; experience in overcoming problem situations in the process of individual work with a client; experience with the supervisor; main directions of social work with the help of trainings.

**Social family support.** State policy in the field of social protection of the family, motherhood and childhood, its regulatory support; types, types, structure, family functions; causes and consequences of the problems of the modern family; models of social work with different types of families; methods, forms, basic principles and procedures for the implementation of social support for families.

**Individual socialization.** The process of socialization. Stages of socialization. The origins of the modern concept of socialization. Bodies of socialization. Mechanisms of inclusion of the individual in social processes.

**Technology of social work.** Basic social technology and social work technology. Possibilities of implementing pedagogical and psychological methods in social and pedagogical work with various groups of clients. The course is based on the concept of a social-pedagogical approach to social work as an assistance to the self-development of an individual, the realization of its creative potential, abilities, inclinations, activation of efforts of clients (individuals, groups, communities) to solve their own problems.

**Informational and communicational technologies in social and pedagogical activities.** The development of computer communication infrastructure. The current state, prospects for the development and application of information technology; features of the use of modern software; organization of work with Web-technologies; specifics of using modern software. The problem of using ICT in professional activities.

### Elective components

#### *Elective bloc 1 (offered by University)*

**Ukrainian for professional purposes.** Lexical, spelling, morphological, syntactic norms of the modern Ukrainian literary language. Sounded speech and its features. The composition of speech. Lexico-grammatical means of relevant reproduction of communicative intentions in writing. Requirements for professional texts: objectivity of presentation, logic, consistency, completeness of information, accuracy, conciseness, standard. A culture of speech. Speech communication etiquette: language patterns of treatment, politeness, apology, coordination, etc.

**Physical training.** Organization and methods of individual training; methods of self-control over the state of their health; development of physical qualities, injury prevention. Classification of exercise. Traditional types of exercise: team, individual. Nontraditional types of physical exercises: copyright, new physical culture and health technologies. Psychophysical training. Personal hygiene. Hygiene of mental labor. Food Hygiene. Hygiene standards and requirements for places of employment. The use of natural factors of its own hardening in order to counteract adverse environmental factors. Receptions massage and self-massage. Rules to prevent physical exhaustion, overtraining, overstrain, and other crisis manifestations. The formation of skills to confidently and skillfully perform physical exercises; conduct individual physical training using the methods of self-control over the functional state of the body; apply physical exercises in order to actively improve individual and professionally significant qualities. Methods of building individual programs for ensuring professional capacity (professional activity) and health improvement programs.

**Philosophy.** The main directions, trends and schools in the history of philosophy. Philosophical understanding of the world. Human awareness of objective and subjective reality. The main content of cognitive activity. Practical way of being human. The purpose

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and value of human activity. Forms and methods of scientific knowledge. Philosophical theory of development. The laws of dialectics. Typology of philosophical systems. The philosophy of man, consciousness, knowledge and language. The philosophy of society, economics, law, culture, science, history. Ecophilosophy. Philosophy, religion, morality, art. Axiology. Modeling philosophical problems. Global problems of our time.

### ***Elective bloc 2 (offered by students)***

**Social work in the field of leisure.** The structure and functions of free time, its content in the field of leisure. Theory and practice of leisure. Organization of work in the field of leisure

**Basics of scenario work.** Specificity, types, forms, genres of theatrical art, its functions. Technology organization writing copyright scripts. Organization and management of the team, features of directorial activities and performance skills in social and pedagogical work.

**Basics of inclusive education.** The main provisions and prerequisites for the emergence of inclusive education. International experience of the emergence, organization and provision of inclusive education. Modern legislative and regulatory framework of Ukraine regulating the organization of inclusive education. The realities and prospects for the introduction of inclusion in Ukraine. Maintenance of the educational process in an inclusive education. The requirements of educational and infrastructural accessibility in an inclusive educational institution. Adaptation and modification of the educational process. Principles, methods, techniques for working with children with visual impairment in an inclusive education. Corrective developmental work and inclusive education of a child with visual impairment. Pedagogical support of children with visual impairments as an assistant teacher. Basics of cooperation in an inclusive educational institution.

**Social gerontology.** Social gerontology as a science. An elderly person as a subject of age-related changes. Social factors determining the status of an elderly person in society. Quality of life for older people. Problems of socialization and socio-psychological adaptation of older people.

**Cohesion group training.** Features of psychological training as a form and method of providing assistance to the individual and the group. Classification of training methods. Basic requirements for the organization and conduct of psychological training. Ethical aspects of conducting psychological training, the procedure for developing a training program for the course and individual training exercises and the characteristics of providing feedback to the group. Planning the work of the training group, taking into account the characteristics of the target audience, the actual conditions of the training and the level of their own competence.

**Social diagnostics.** The purpose, tasks of social diagnostics as a science, academic discipline and technology of social work. Principles of social diagnosis. Requirements for the professional level of social diagnostics. Methods of social diagnosis.

**Methods of social work.** Methodological and methodological features of methods of social and educational activities. Forms, methods, techniques of social and educational activities in the provision of social services. Methods of social forecasting and design. Methods of introducing social innovations into practice. Modeling social and pedagogical processes. Methods of social statistics in social work.

**Leadership.** The problem of leadership in the public sphere. Leadership Theories Professional qualities of a manager, organizational and psychological characteristics of his activities. Power and influence as tools of leadership. Leadership as a group process. Image of the leader. Development of leadership potential of the individual. Oratorical art leader. Organization and monitoring of management decisions, the system of responsibility.

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**Organization of social insurance.** Legal regulation of social security. The history of the formation and development of social security. Principles, forms, methods, patterns of social security. Calculation of social security.

**Preventional pedagogics.** Means, forms, methods of preventive education aimed at the development, organization of certain activities through the inclusion in educational measures and prevention of delinquent behavior among children and young people.

**Rehabilitational work of a social worker with people with disabilities.** The legal framework of social protection of people with disabilities, the system of state and non-state institutions and institutions, forms, methods of social work with people with disabilities.

**Social therapy problems of an individual and group.** Social therapy as a complex technology of social work. The goals and objectives of social therapy, its place in a number of social technologies. Social therapy as a "treatment" of social diseases. The main models of psychotherapy: as a method of treatment; as a means of manipulation; as a method that activates the process of personal learning; as a complex of phenomena arising in the course of interaction between people.



**Bachelor**  
**Field of Knowledge "Human sciences"**  
**in specialty "PHILOLOGY"**  
**Educational-professional program "Philology (German Languages and Literature)**  
**(Including Translation) English and Other Foreign Language"**

Form of Training:	Licensed number of persons:
– Full-time	100
– Part-time	25
Duration of Training:	
– Full-time educational and professional program	4 years
– Part-time	4,5 years
Credits ECTS:	
– educational and professional program	240
Language of Teaching	Ukrainian, English, German, French, Polish
Qualification	Bachelor in Philology, English and other foreign language teacher

### **The concept of training**

Training in "Philology (Translation)" are stipulated by requirements in the translation of scientific and technical literature and documentation in agrobiological, engineering and technology, forestry, ecology, research in product quality and safety, agribusiness, agricultural economics and others.

### **Practical Training**

Practical training is carried out according to the schedule of the educational process directly at certified practice bases, including: the Ukrainian Research Institute of productivity agriculture, commodity exchange "Kiev agroindustrial exchange", Department of Internal Policy administrative-territorial organization and information management executive office Khmelnytski Regional Council, Ukrainian Institute examination of plant varieties, LLC "Fund Environmental (Green) Investments", Cultural Center "Cambridge University Press", enterprise with foreign capital PIC "Orsi", LLC "Idex-production" Private Enterprise "Antario M".

### **Employment of Graduates**

Specialist in philology is able to translate scientific, technical (agricultural) and business literature, work as a translator or interpreter at industrial and business establishments, professional and social organizations, publishing houses. Also a graduate can work as a teacher of foreign languages at secondary schools.

**Bachelor`s Program and Curriculum  
in Specialty "Philology"  
Educational-professional program "Philology (German Languages and  
Literature) (Including Translation) English and Other Foreign Language"**

Code n/a	Components of the educational program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components of EPP</b>			
CC 1.1	Psychology	4	exam
CC 1.2	Fundamentals of Information Technologies and Applied Linguistics	4	exam
CC 1.3	Introduction to Translation Studies	4	exam
CC 1.4	Latin Language	4	exam
CC 1.5	Introduction to Linguistics	4	exam
<b>The total amount of compulsory components</b>		<b>20</b>	
<b>Optional components of EPP</b>			
<i>Optional Block 1 (University Choice)</i>			
OB 1.1	History of Ukraine	4	exam
OB 1.2	Philosophy and Logic	4	exam
OB 1.3	Modern Ukrainian language	4	exam
OB 1.4	Physical Education	8	credit
OB 1.5	Ethnocultural Studies, Ethics and Aesthetics	4	exam
OB 1.6	Pedagogy	4	exam
OB 1.7	Basics of Business Planning	4	exam
OB 1.8	Plant Growing Technology	4	exam
OB 1.9	Livestock Technology	4	exam
<b>The total amount of optional components</b>			
<i>Optional Block 2 (Student's Choice)</i>			
CC 2.1	Information Technology in Translation Projects	4	exam
CC 2.2	Polish Language	4	exam
<b>The total amount of optional components</b>		<b>8</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components of EPP</b>			
OB 2.1	Practical Course of the Main Foreign Language	61	exam
OB 2.2	Introduction to German Linguistics	4	exam
OB 2.3	Stylistics of the Main Foreign language	4	exam
OB 2.4	Comparative Lexicology of the Main Foreign and Ukrainian languages	4	exam
OB 2.5	Comparative Grammar of the Main Foreign and Ukrainian languages	4	exam
OB 2.6	Practice of Translation and Interpretation	11	exam
OB 2.7	Literature of Countries whose Language is Studied (the Main Language)	4	exam
OB 2.8	Practical Grammar of the Main Foreign Language	11	exam
OB 2.9	History of the Main Foreign Language	4	exam
OB 2.10	Scientific and Technical Translation	4	exam
OB 2.11	Linguistic and Country Studies of Countries of the Main Foreign Language	4	exam
OB 2.12	Computer Lexicography and Translation	4	exam
<b>The total amount of optional components</b>		<b>119</b>	
<b>Optional components of EPP</b>			
<i>Optional Block 1 (University Choice)</i>			
OB 2.1	Theoretical and Practical Phonetics of the Main Foreign Language	6	exam
	Practical Phonetics of the Main Foreign Language		
	Theoretical Phonetics		
OB 2.2	Aspect Translation of Agrarian Literature	4	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.3	Translation of Business Language and Correspondence	4	exam
OB 2.4	Methodology of Teaching Foreign Languages	4	exam
<i>Optional Block 2 (Student's Choice)</i>			
OB 2.5	Practical Course of the Second Foreign Language and Translation	38	exam
OB 2.6	Semantic and Stylistic Problems of Branch Texts Translation: a Cycle of Natural Sciences; a Cycle of Technical Sciences; a Cycle of Economic	4	exam
<b>The total amount of optional components</b>		<b>60</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 3.1	Military Education and Training		
CC 3.2	Cultural and Educational Training		
CC 3.3	Literature for Children		
CC 3.4	Induction Translation Practice	3	
CC 3.5	Externship Pedagogical Practice	3	
CC 3.6	Externship Translation Practice	2	
CC 3.7	State Examination	1	
<b>The total amount of other types of training</b>		<b>9</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

**Annotations of components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components of EPP**

**Psychology.** General issues of psychology; the peculiarities of psyche development in phylogenesis and ontogenesis; psychological processes; states of mind and person's peculiarities.

**Fundamentals of Information Technologies and Applied Linguistics.** Structure peculiarities and technical characteristics of modern personal computers and other devices, their application in conducting linguistic research and translation.

**Introduction to Translation Studies.** Translation and its types; the history of foundation and development of translation theories in Ukraine and other countries; theory and classification of translation units; lexical, grammatical and syntactic transformations; stylistic characteristics of idioms, proverbs and sayings, slang, phrasal verbs, and colloquial expressions.

**Latin Language.** Mastering the Latin language, as well as skills needed for translating Latin texts and using Latin terminology in teaching, scientific and production activities.

**Introduction to Linguistics.** General issues of contemporary linguistics: general information about language and linguistics as a discipline, nature and essence of language, its origin, regularities of its development and functioning at different historical stages, origin and development of writing, genealogical and typological classification of languages, structural levels and language units, etc.

**Optional components of EPP*****Optional Block 1 (University Choice)***

**History of Ukraine.** The discipline envisages deep mastering and understanding the history of origin and formation of Ukrainian people and Ukrainian statehood, consolidation of national originality, interpretation of political activity of classes and social groups in Ukraine at different stages of historical development. The overall aim of the course is to train highly qualified specialists of agro-industrial complex on the principles of higher school humanization, integration of professional, social and humanitarian training, improvement of the content of the course structure, application of the achievements of world and national conceptions, universal values.

**Philosophy and Logic.** The course provides the system of knowledge in such branches of philosophy as ontology, gnoseology, social philosophy, historical types of philosophy that explain the essence of relations “a human being – the world” in its main displays. The course is marked by ideological orientation, which allows synthesising the acquired knowledge on professional and humanitarian disciplines in a holistic worldview – the theoretical basis of the university level of training specialists. The method of logic, the basic forms and laws of thinking, the preconditions for the emergence of modern logic, the division of classical logic, the typology and analysis of formal logical theories within the logic of utterances and the logic of predicates.

**Modern Ukrainian language.** Orthographic, morphological, lexical, stylistic, syntactic and punctuation norms of the contemporary standard Ukrainian language; genres of professional communication and their main communicative features; culture of dialogue and political speech; the principles of structural-stylistic analysis and correction of the text in accordance with the norms of the standard Ukrainian language.

**Ethnocultural Studies, Ethics and Aesthetics.** The discipline studies the development of cultural (and linguistic-cultural) processes among peoples during their development. One of the aspects of ethnocultural studies is the specifics of everyday, factual and other types of communicative behaviour of the ethnic group. The main tendencies in modern international communication, the basis of the international protocol and etiquette, diplomatic and international correspondence are considered as well.

**Physical Education.** The purpose of teaching the discipline is the formation of the physical culture of a young specialist and the ability to implement it in the social-professional activity and family. The task is to strengthen the students' health and develop physical abilities that correspond to the professional activity of a future specialist.

**Pedagogy.** The discipline deals with the theory and practice of organization of teaching (didactics), education and management of education (school science).

***Optional Block 2 (Student's Choice)***

**Information Technology in Translation Projects.** Implementation of translation activities with the use of automated translation systems (CAT-systems), working out collective interaction in the implementation of translation projects with the use of SDL Trados.

**Polish Language.** Acquiring knowledge on phonetics, vocabulary, grammar and stylistics of the Polish language, mastering skills of translating Polish authentic texts. Orthographical, morphological, lexical, stylistic, syntactic and punctuation norms of contemporary standard Polish language; genres of formal and informal communication and their main communicative features; culture of dialogue and political speech; the principles of stylistic analysis and correcting the text in accordance with the norms of contemporary standard Polish language.

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## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components of EPP

**Practical Course of the Main Foreign Language.** Acquiring knowledge in phonetics, vocabulary, and practical grammar of the foreign language; mastering reading and listening skills as well communication and writing skills.

**Introduction to German Linguistics.** Introduction to German linguistics is an introductory course both to the philological disciplines, and, in general, to all humanitarian disciplines. The course introduces students to Germanic languages and their native speakers, and cultures, helps to master the basic concepts of German studies, and gives an idea of the methods and techniques of scientific research, typical for German studies.

**Stylistics of the Main Foreign language.** The essence of the language stylistics, communicative and texts stylistics, functioning of language units in the language system; functioning styles and their characteristics, criteria, methods of analysis and texts' interpretation.

**Comparative Lexicology of the Main Foreign and Ukrainian languages.** Theoretical fundamentals of lexicology and lexicography: practical application of the language units in communication; lexical skills and habits mastering.

**Comparative Grammar of the Main Foreign and Ukrainian languages.** Typological peculiarities of the foreign and Ukrainian languages; grammatical constructions in compared languages; similar attributes and distinctions in the systems of grammar categories in various parts of speech, and syntactic units.

**Practice of Translation and Interpretation.** Theoretical and practical fundamentals of translation and interpretation; translation transformations; non-equivalent vocabulary; types of semantic equivalents; contextual meaning of lexical units; types of semantic equivalents; factors of style.

**Literature of Countries whose Language is Studied (the Main Language).** Introduction to the literary development and the genre-style system of literature of the English-speaking countries, a general characteristic of the works by prominent writers of these countries in different epochs, an analysis of the most significant works.

**Practical Grammar of the Main Foreign Language.** Studying grammatical system of the foreign language, acquiring skills of recognition, understanding and use of grammatical forms in oral and written communication.

**History of the Main Foreign Language.** Processes of language and its structure formation and development; the language historical characteristics and attributes; similarity with other languages of the same language group; its specific peculiarities.

**Scientific and Technical Translation.** Solution of grammatical, lexical, terminological and genre-stylistic tasks; ways of translation of different scientific and technique phenomena.

**Linguistic and Country Studies of Countries of the Main Foreign Language.** Language units that reflect national cultural peculiarities, formation of communicative students' competency in intercultural communications through appropriate perception of oral speech and original texts.

**Computer Lexicography and Translation.** It is designed to introduce students to the contemporary lexicography and illustrate connection between computer lexicography and translation. The course involves mastering basic concepts of computer lexicography; study of types, kinds and structure of electronic dictionaries; their usage and creating.

**Optional components of EPP*****Optional Block 1 (University Choice)***

**Practical Phonetics of the Main Foreign Language.** The course of phonetics of contemporary English involves general acquaintance of students with phonemic characteristics, sound changes in the speech flow (accommodation, assimilation, dissimilation, alternation, simplification, elongation, prosthesis, epenthesis, and metathesis). The stress and emphasis, practical composition, and intonation are also included in this course. Students will learn theoretical material, develop practical skills in phonetic and phonological transcription and phonetic analysis of the text.

**Theoretical Phonetics.** The course of theoretical phonetics of English is intended to study the problems of modern phonetic science and the functioning of phonetic units in the language. The aim of the course is to study the sound system of the language, segmental phonemes, stress and emphasis, component structure, intonation from the theoretical point of view.

**Aspect Translation of Agrarian Literature.** Theoretical fundamentals of the translation of texts on agrarian subjects, methods of adequate reproduction of various types of terminology, characteristic of agrarian literature, the formation of skills for adequate translation.

**Translation of Business Language and Correspondence.** Basic lexical and grammatical features of the style of business language and speech as well as means of their reproduction in translation, genre classification of business documents are considered within the course.

**Methodology of Teaching Foreign Languages.** Objectives, content, principles of teaching foreign languages; methods and forms of teaching; planning of the foreign language teaching-learning process; technologies of formation of language and speech competences at the level determined by the current legislation.

***Optional Block 2 (Student's Choice)***

**Practical Course of the Second Foreign Language and Translation.** Acquiring knowledge on phonetics, vocabulary, practical grammar, mastering skills of listening, reading and literally normalized oral and written speech.

**Semantic and Stylistic Problems of Branch Texts Translation: a Cycle of Natural Sciences; a Cycle of Technical Sciences; a Cycle of Economic Sciences.** The system of theoretical knowledge and specific patterns of adequate translation of the linguistic units (words, combinations, idioms, free phrases specific by their structural form, sentences, text; familiarization with the semantic-stylistic problems of translating texts of the following branches: natural sciences, technical sciences, economic sciences.

**Bachelor  
field of knowledge «INTERNATIONAL RELATIONS»  
in specialty «INTERNATIONAL RELATIONS, PUBLIC COMMUNICATION AND  
REGIONAL STUDIOS»  
Educational-professional program  
«INTERNATIONAL RELATIONS, PUBLIC COMMUNICATION AND REGIONAL  
STUDIOS»**

Form of education:	Licensed amount:
– full-time	100 people
– external	
Training period: full-time form	4 years
External form	5 years
Credits	240 ECTS
Teaching language	Ukrainian, English
Qualification of graduates	an expert on international relations

### **Concept of training**

Training in the field of international relations, public communications and Regional Studios is a response to a notable request of government and businesses, and therefore society for highly qualified professionals in the context of setting up, development and moving to the new level of partnership and communication between different in structure and functionality subjects of international relations and law. Planned by curriculum systematic mastery of a number of professional and operational knowledge and skills will allow specialists in international relations navigate well in the socio-political, economic and cultural movements and events specific to the different level and scales of relations and cooperation between the subjects of international relations, perform their duties as the professionals.

### **Practical training**

Practical training is carried out according to the schedule of the educational process directly in certified practical institutions, including: trade representations and other representative organizations of Ukraine abroad; foreign states representations and international organizations in Ukraine; Ukraine-foreign joint stock, public and private enterprises; public organizations which have close contacts with foreign countries; structural units of Cabinet of Ministers of Ukraine; Ministry of Foreign Economic Relations of Ukraine; other republican departments, that are a subdivision of Foreign Affairs; domestic and foreign research institutes and laboratories.

### **Approximate topics of graduation bachelor (diploma) works**

1. Geopolitics of sovereign Ukraine: historical and geographical factors of formation
2. Ukraine - EEC: Political and Legal Aspects of Accession.
3. BREXIT: Important for UK, Europe and Ukraine.
4. Budapest Memorandum: The intentions of the parties and the international and political implications for Ukraine.
5. Diplomatic relations between Ukraine and Hungary at the present stage.
6. Relations between Ukraine and the United States: Strategic Partnership in a Globalization.
7. Ukraine and the Levant countries: cooperate for peace.
8. Ukraine in the UN: a policy for the preservation and consolidation of peace.

9. Ukrainian-Romanian relations at the present stage.

10. Relations between Ukraine and the People's Republic of China: political and economic significance for both sides.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

A specialist in international relations, public communication and regional studies can be employed at embassies, consulates, trade representations and other representative organizations of Ukraine; offices of other countries and international organizations in Ukraine; Ukraine joint-stock foreign, public and private enterprises; public organizations that have close contacts with foreign countries; structural units of President of Ukraine Office; Secretariat of the Supreme Council of Ukraine; structural units of Cabinet of Ministers of Ukraine; Ministry of Foreign Affairs of Ukraine; Ministry of Foreign Economic Relations of Ukraine; other national agencies, that are a subdivision of Foreign Affairs; domestic and foreign research institutes and laboratories.



**Bachelor`s Program and Curriculum in Specialty  
«International relations, public communications and regional studios»  
Educational-professional program  
«International relations, public communications and regional studios»**

Code e/d	Components of the educational-professional program (educational disciplines, course projects (work), practice, qualification work)	ECTS credits	Form of final control
1	2	3	4
<b>1. CYCLE OF GENERAL TRAINING</b>			
<b>Compulsory components</b>			
CC 1.	World Economy and Foreign Economic Relations of Ukraine	4	exam
CC 2.	Conflictology and Theory of Negotiation	4	exam
CC 3.	Fundamentals of World Policy	4	exam
<b>Selective components</b>			
<b>Selective block 1 (by choice of university)</b>			
SB 1.1.	Foreign Language	19	test, exam
SB1.2.	History of Ukrainian Statehood	4	exam
SB 1.3.	Ethnic and Cultural Science	4	exam
SB1.4.	Ukrainian Language for Specific Purposes	4	exam
SB1.5.	Physical Education	6	test
SB 1.6.	Philosophy	4	exam
<b>2. CYCLE OF SPECIAL (PROFESSIONAL) TRAINING</b>			
<b>Compulsory components</b>			
CC4.	Fundamentals of Geopolitics and Geostrategy	4	exam
CC5.	Fundamentals of Scientific Research	4	exam
CC6.	Actual Problems of International Relations in Asia, Africa and Latin America	4	exam
CC7.	Introduction to Specialty «International Relations»	4	exam
CC8.	Diplomatic and Consular Service	4	exam
CC9.	Diplomatic Protocol and Etiquette	4	exam
CC0.	European Union in International Relations	4	exam
CC11.	Foreign Policy and Diplomacy of Ukraine	4	exam
CC12.	Foreign Policy of Western European and North American Countries	4	exam
CC13.	Foreign Policy of the Former Soviet Union	4	exam
CC14.	Foreign Policy of CEE and SEE Countries	4	exam
CC15.	Foreign Language for Specific Purposes	14	test, exam
CC16.	Informational and Analytical Activities in International Relations	4	exam
CC17.	History of International Relations	6	exam, KW
CC18.	Country Studies and Fundamentals of International Tourism	9	test
CC19.	International Information and Modern Political Systems and Technologies	7	exam
CC20.	Private International Law	4	exam
CC21.	International Relations and World Policy	8	exam, KW
CC22.	International Economic Relations with Fundamentals of Economic Theory	4	exam
CC23.	International Organizations	4	exam
CC24.	Comparative Constitutional and Public International Law	5	exam
CC25.	Practical Course of Branch Translation	18	test, exam
CC26.	Current Trends in International Relations	4	exam, KW
CC27.	Theory of Civilizations and International Conflicts	5	exam
CC28.	Theory of International Relations	4	exam
<b>Total volume of compulsory components</b>		<b>152</b>	
<b>Selective components</b>			
<b>Selective block 1 (by choice of university)</b>			
SB 1.7.	Safety Life Activities	4	exam
<b>Selective block 2 (at the student's choice)</b>			
SB 2.1.	Humanitarian Challenges of Our Time	4	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

SB2.2.	Cultural, Spiritual and Religious Traditions of the World's Countries	4	exam
SB 2.3.	Foreign Language II	7	test
SB 2.4.	Fundamentals of Agricultural Consulting and Marketing in the International Relations	4	exam
	Fundamentals of Business-Designing		
	Plant Growing Technologies		
	Livestock Technologies		
SB 2.5.	Theory and History of the State, Law and Political Studies	5	exam
SB 2.6.	Economic Geography of the World's Countries	4	exam
SB 2.7.	History of Diplomacy	4	exam
SB 2.8.	The Political Geography of the World's Countries	4	exam
SB 2.9.	Politology and Sociology	4	exam
SB2.10.	Regional Science, Ethnic and Demographic Processes in the World Regions	5	exam
<b>Other types of training</b>			
Educational internship		5	test
Work experience internship		3	test
Final state attestation		4	exam, bachelor's thesis
<b>Total volume of selective components</b>		88	
<b>TOTAL VOLUME</b>		240	

**Annotations components of the curriculum**

**1. CYCLE OF GENERAL TRAINING**

**Compulsory components**

**World Economy and Foreign Economic Relations of Ukraine.** The peculiarities of functioning of the world economic sphere, the system of existing and prospective foreign economic relations of Ukraine, the problems encountered before the state are considered.

**Conflictology and Theory of Negotiation.** The nature of conflict and possible solutions, including an efficient negotiation process; systematic professional approach to work with conflict and organizing negotiations.

**Fundamentals of World Policy.** Nature of key events, phenomena and processes inherent to world politics, the common patterns; analysis of processes that are inherent to world politics and the strategy and tactics of behavior for different actors in world politics.

**Selective components**

**Selective block 1 (by choice of university)**

**Foreign Language.** Mastering phonetic, lexica, and practical grammar knowledge, as well as skills dealing with audio, reading, oral and written communication.

**History of Ukrainian Statehood.** Provides deep understanding of the history and formation of the Ukrainian people and Ukrainian state system, strengthening national identity, political activity of classes and social groups in Ukraine at certain stages of historical development. Overall purpose of the course, based on processes of humanization of higher education, professional integration and socio-humanitarian training, the achievements of world and domestic ideas, human values, is to train highly qualified specialists.

**Ethnic and Cultural Science.** Culture, methodological study of cultural phenomena. Typology of cultures, comparative analysis of cultural evolution, development of Ukrainian culture. Traditional Ukrainian culture of family communication, housing maintenance, housekeeping.

**Ukrainian Language for Specific Purposes.** Orthographic, morphological, lexical, stylistic, syntax and punctuation rules of modern Ukrainian literary language; Genres of professional communication and basic communication features; culture of political dialogue and speech; principles of structural and stylistic analysis and correction of the text in accordance with Ukrainian language.

**Physical Education.** Basics of maintaining a healthy lifestyle and the benefits of physical activity. Mastering basic elements of massively popular sports game, help maintain a high level of physical skill and physical health.

**Philosophy.** The course creates a system of knowledge consisting of the following aspects of philosophy: ontology, epistemology (theory of knowledge), social philosophy, philosophy of historical types, revealing the nature of the relation "man - the world" in its most basic forms. The phenomenon of religion, its origin, the basic religious concepts, history and present situation of tribal, early and late religions, the main provisions of faith and worship of the most influential religions in the world. The methods of logic, basic forms and laws of thought, the prerequisites of modern logic, classical logic division, typology and analysis of formal theories of logic.

## 2. CYCLE OF SPECIAL (PROFESSIONAL) TRAINING

### Compulsory components

**Fundamentals of Geopolitics and Geostrategy.** The essence of geopolitics and geostrategy as the foundation for international politics, principles of their implementation; planning the strategies of developments of events, given the characteristics of the economic and political situation, mentality and other factors inherent to the object of attention and study.

**Fundamentals of Scientific Research.** Strategy, principles and methods of organization and research.

**Actual Problems of International Relations in Asia, Africa and Latin America.** The combination of the current problems in the context of international relations faced by the countries of Asia, Africa and Latin America, its genesis and directions of a solution.

**Introduction to Specialty «International Relations».** The specifics of the specialty "International Relations", determine the fundamental concepts and principles of international relations and their proceedings.

**Diplomatic and Consular Service.** Particularities of diplomatic and consular service, facts and historical knowledge accumulated in the context of diplomatic and consular service; Analysis of diplomatic activities of international actors in the process of bilateral and multilateral diplomacy to resolve the political-administrative, organizational, legal, information and analysis, staffing and other problems within the government units of External Relations to implement foreign politic interests of Ukraine.

**Diplomatic Protocol and Etiquette.** The history of diplomatic protocol and etiquette, specifics of diplomatic negotiations protocol; major diplomatic documents, their analysis.

**European Union in International Relations.** Key features of the European Union as a subject of international relations, history of its creation, its strengths and weaknesses.

**Foreign Policy and Diplomacy of Ukraine.** Particularities of foreign policy and diplomacy of Ukraine, the challenges of internal and external nature, that arise from national interests and national security of Ukraine; analysis of internal and external factors and their influence on politic and diplomatic activities of Ukrainian state.

**Foreign Policy of Western European and North American Countries.**

Particularities of the foreign policy of Western European and North American Countries, the specifics of foreign policy of countries of the region, role and place of Western European and North American Countries in world policy.

**Foreign Policy of the Former Soviet Union.** Particularities of the organization of political, socio-economic and cultural life of the countries that arose in the territory of the former USSR; specificity of interaction between Former Soviet Union: interstate relations, contradictions, conflicts, ways of their solution; CIS as a subject of international law and relations, peculiarities of its functioning; the role of the Russian Federation in the life of the Former Soviet Union, in particular as successor to the USSR; the position of Ukraine in the Former Soviet Union: friends and rival states; Baltic-Black Sea Union, its destiny; GUAM, principles and perspectives of functioning; peculiarities of diplomatic activity and foreign policy activity of Former Soviet Union.

**Foreign Policy of CEE and SEE Countries.** Particularities and key principles of foreign policy countries of the region, the role and the place of CEE and SEE in world policy; differences and similarities in the foreign policy countries of the region.

**Foreign Language for Specific Purposes.** 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 source are studied.

**Informational and Analytical Activities in International Relations.** Information flows, new technologies of information analysis; analysis of relations between the subjects of international law and relations; current trends and issues of international communications and information.

**History of International Relations.** International relations, their laws, the major international conflicts, diplomatic events, peace talks, conference documents and materials that characterize international relations.

**Country Studies and Fundamentals of International Tourism.** Classification and typology of countries, regional division of the world, and the historical development of the culture, especially the political and state structure of the country, the main directions of economic development of foreign countries.

Types and forms of international tourism, the main factors affecting the development and territorial organization of international tourism, the main trends of the modern world tourist complexes; specific characteristics of different types of international tourism, analysis of factors and features of the territorial organization of tourism in the world.

**International Information and Modern Political Systems and Technologies.** The essence and peculiarities of international cooperation in the field of information and communication, the role and functions of international organizations in shaping and implementing the ideology of information society; current status and trends of global communication processes and their impact on the global, regional and national politics, research and prediction of problems of the international community in the field of information and communication. The essence of information and information processes, information sources, especially the interaction of information sources. The rules and principles of operating information, defending your rights and freedoms as a carrier and recipient of information, organization and management of communication flows and channels.

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**Private International Law.** Types of sources, directives of the national legal system to regulate international private relations and international regulatory documents, principles of regulation of the legal status of individuals and legal persons in private international law.

**International Relations and World Policy.** The nature of the main features of the driving forces and mechanisms of international relations in the political, economic and cultural spheres from antiquity to the present.

**International Economic Relations with Fundamentals of Economic Theory.** Main forms of international economic relations, international division of labor trends, the main conceptual approaches to the analysis of international economic relations, trends and features of development of integration processes in the global economy. The essence of economic phenomena and processes; economic context of property relations, distribution, exchange and consumption of material and spiritual values in the society and the principles of economic activity, basic laws and principles of functioning of industrial sector and market.

**International Organizations.** The nature of the international organizations, the history of their origin and classification; the role of international organizations in streamlining global political and economic space, and in the life of Ukraine.

**Comparative Constitutional and Public International Law.** Fundamentals of constitutional and legal systems of the world; forms of government inherent to different countries, the sources of state law of foreign countries, modern types of constitutions basis of the legal status of a person in foreign countries. Key provisions of international and domestic law, types of liability and sanctions in international public law; relationship between international and domestic law.

**Practical Course of Branch Translation.** Overall, phraseology and lexical-morphological and syntactic aspects, and the main task of translation; rules of translation as a kind of communicative activity, guidelines for adequate translation.

**Current Trends in International Relations.** Features of the system of international relations from the end XX century until now, the specifics and trends in contemporary international relations, especially the role of countries and regional and international organizations; features of the modern world order, international relations, political realities of the regions and the world at large, expert evaluation of events and phenomena of political life.

**Theory of Civilizations and International Conflicts.** Common features in the development of civilizations in the world, global problems of today and their impact on the development of future civilizations, analysis of civilizational cycles facts about the historical development of civilizations of past and present, their material and spiritual culture, religion, etc. The essence and nature of international conflicts, especially their flow and the mechanisms that led to their solution; modern conceptual framework and modern approaches of foreign and domestic thinkers associated with the study of the nature of conflict, especially their escalation and settlement, controlling the conflict.

**Theory of International Relations.** Basic theory of international relations, types of international systems, their structure and basic properties; analysis of processes and phenomena in the international environment, predictions about the likely situations in international and world politics.

## Selective components

### Selective *block 1 (by choice of university)*

**Safety Life Activities.** Fundamentals of life safety, key rules for the organization of production environment. Principles and approaches of habitat assessment on personal security, staff, society and the monitoring of dangerous situations.

### Selective *block 2 (at the student's choice)*

**Humanitarian Challenges of Our Time.** The essence and role of humanitarian factor in human existence and humanity, and safeguard mechanisms to stabilize the socio-political and economic systems from excessive exposure to humanitarian factor; the ability to determine the role of humanitarian factors in each situation and globally, as well as features of its sources and methods and ways to neutralize its influence or lead it in the desired direction.

**Cultural, Spiritual and Religious Traditions of the World's Countries.** Major cultural and religious heritage and traditions of ethnic groups in the world, including Ukrainian, the principles on which there is distinction and classification of cultural achievements. Searching and providing comprehensive characteristics of a particular ethnic heritage.

**Foreign Language II.** The set of concepts and terms that make extensive vocabulary and rules of language, grammar and syntax.

**Fundamentals of Agricultural Consulting and Marketing.** The principles and rules for consulting support, basic information on the functioning of the agricultural sector. The rules and ways of providing consulting services, comprehensive analysis of the peculiarities of the agricultural sector and the international market of agricultural products and related products and services. The essence and principles of management and decision making; structure of economic and exchange domains, rules of their operation.

**Fundamentals of Business-Designing.** The peculiarities of the fundamentals of business-designing, basic information on starting own occupation and own business are considered. The essence of economic phenomena and processes in business-designing, a comprehensive analysis of the agrarian sector and the international market of agricultural products, the exchange and consumption of material and spiritual goods in society.

**Plant Growing Technologies.** The main objective of the discipline is providing knowledge about creating the optimal technological (agroecological) preconditions for the production of the required quantity of high-quality crop production based on intensive photosynthesis in crops of field crops while maintaining or increasing the soil fertility. The main task is: get practical skills in producing high-quality, environmentally friendly products with minimal energy and labor costs at its maximum output per unit time per unit area, which requires the wide introduction of high-quality, intensive, energy and resource-saving environmentally-appropriate technologies. Theoretical foundations of labor protection. Legal bases of labor protection of workers in plant growing. Safety in plant growing. Fire safety in crop production.

**Livestock Technologies.** The scientific provisions and practical issues of the discipline envisaged for study have an immediate and direct relation to the future scientific or practical activity of students. This applies both to issues of the scientific basis of the economy and the organization of livestock industries, the activities of agricultural enterprises, planning of the technology of production of the main types of livestock products, as well as a deep understanding and knowledge of the essence of the biological properties of a living organism, the laws of its development, the relationship of the

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organism and the environment, historical development the body. In addition, the state of livestock in Ukraine and the introduction of new technologies for the production of livestock products require the ability to evaluate the effectiveness of a technology, taking into account its components. Theoretical foundations of labor protection. Legal bases of labor protection of animal husbandry and veterinary staff. Fundamentals of industrial sanitation. Safety in livestock and poultry farming. Fire safety in livestock and poultry farming.

**Theory and History of the State, Law and Political Studies.** The nature and essence of the leading political institutions and basic streamlining the legal framework in the country; leading characteristics of the state and socio-political situation in and around it, given the wide range of political and legal knowledge. The set of theories and doctrines aimed at disclosure of political institutions, processes and phenomena; analysis of political institutions, processes and phenomena taking into account historical experience and political precedents.

**Economic Geography of the World's Countries.** The nature of economic and environmental issues, conditions of economic activity, especially of territorial differentiation. Rules and principles of complex economic and geographic characteristics of certain areas, analysis of economic development around the world.

**History of Diplomacy.** Features and basics of diplomacy, patterns of its development in different historical periods. Understanding the historical trends of diplomacy, basics of knowledge in the field of diplomacy for analyzing situations and diplomatic conflicts.

**The Political Geography of the World's Countries.** Modern political map of the world, basic schools, trends and paradigms of geopolitics. Analysis of the main regional geopolitical problems in the world, expert assessment of the geopolitical situation of the country.

**Politology and Sociology.** Theoretical and methodological problems of political knowledge, the development of views of prominent thinkers of foreign and domestic politics, the place and role of political actors in the system of political and power relations of society; state politics principles. The structure of sociological knowledge based on the sociological analysis of society, analysis of social phenomena and processes in terms of sociology, basic methodological principles of organizing and conducting sociological research.

**Regional Science, Ethnic and Demographic Processes in the World Regions.** The main theoretical approaches to the analysis of regionalism concept of socio-politically distinction, especially political regionalization. Expert review of the socio-economic features and political development of specific regions. Basic demographic processes in the world and in Ukraine, their characteristics, causes, conditions and circumstances, given the specificity of ethnic and cultural spirit of the people; systemic vision of events in different regions and countries and development of projects to achieve certain goals in a given region.

**Bachelor**  
**Field of Knowledge "Education"**  
**in Specialty "PROFESSIONAL EDUCATION (TECHNOLOGY OF PRODUCTION AND**  
**PROCESSING OF AGRICULTURAL PRODUCTS)"**  
**Educational-professional program «Professional education»**

Form of Training:	Licensed number of persons:
– Full-time	50 persons
– Part-time	50 persons
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian, English
Qualification	Pedagogue of professional education

### **Concept of training**

Training of pedagogue of professional education is determined by demand in professional who conduct activity of teaching and educational process organising, methodological and scientific activity in technical colleges and agricultural colleges, and conduct different arrangements which promote social development of youth in agricultural establishments of higher education.

### **Practical training**

Practical training is conducted according to the plan of studying process on such practice bases as technical colleges and establishments of higher education.

### **Proposed Topics for Bachelor theses**

1. Ways of pedagogical mastery forming of future teachers in technical colleges and establishments of higher education.
2. Activation of students' cognitive and studying activity.
3. Methods of controlling progress.
4. Methods individual work organizing
5. Personality forming of future specialist in spheres of environmental protection and agricultural establishments of higher education according national patriotic values.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Graduate with qualification "pedagogue of professional training" may work as teacher in technical college, methodologist of correspondence schools and departments; junior scientific researcher; teacher-methodologist; inspector of special and technical colleges; inspector-methodologist.



**Bachelor`s Program and Curriculum  
in Specialty «Professional education  
(technology of production and processing of agricultural products)»  
Educational-professional program «Professional education»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC1.	Valeology and basic medical knowledge	4,0	exam
CC2.	Psychology of work and personal ecoculture	4,0	exam
CC3.	Leadership and administration	4,0	exam
CC4.	Basics of economical knowledge	4,0	exam
<b>Optional subjects</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1.	Ukrainian language in professional communication	4,0	exam
OB 1.2.	History of Ukraine	4,0	exam
OB 1.3.	Ethnoculturology	4,0	exam
OB 1.4.	Philosophy	7,0	exam
OB 1.5.	Foreign language	16,0	exam
OB 1.6.	Legal culture	3,0	exam
OB 1.7.	Latin language	3,0	exam
OB 1.8.	Physical training	8,0	credit
<b>The volume of components of the general training cycle</b>		<b>65</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC5.	General and professional pedagogics	7,0	exam
CC6.	Educational work organising	4,0	exam
CC7.	Management of educational establishments	4,0	exam
CC8.	Basics of scientific and pedagogic research	4,0	exam
CC9.	Psychology	12,0	exam
CC10.	Basics of pedagogic mastery	4,0	exam
CC11.	Pedagogical technologies	4,0	exam
CC12.	Legislation of Management of educational establishments	3,0	exam
CC13.	New innovation technologies	4,0	exam
CC14.	Introduction to speciality	5,0	exam
CC15.	Pedagogics of family education	4,0	exam
CC16.	Foreign history of pedagogics and education	4,0	exam
CC17.	History of pedagogics and education in Ukraine	4,0	exam
CC18.	Teaching technologies of professional subjects	10,0	exam
CC19.	Basics of career-guidance	4,0	exam
CC20.	Comparative pedagogics	8,0	exam
CC21.	Pedagogical ethic	4,0	exam
CC22.	Basics of eloquence	4,0	exam
CC23.	Social work in entertainment sphere	4,0	exam
CC24.	Age and pedagogical psychology	4,0	exam

<b>Optional components</b>			
<i>Optional Block 1 (Student's Choice)</i>			
OB 2.1	Technology of production and processing of crop production	4,0	exam
	Fundamentals of Business-Designing		
OB 2.2	Technology of production and processing of animal products	6,0	exam
	Higher mathematics	4,0	exam
	Physics		
	Floriculture		
OB 2.3.	Botanic	34,0	exam
	Meteorology and climatology		
	Informatics		
OB 2.4.	Chemistry	4,0	exam
	Geology and basics of geomorphology		
	Microeconomics		
	Ethics and etiquette		
OB 2.5.	Farming	4,0	exam
	Biology		
	Geodesy		
	Accounting		
	Painting		
OB 2.6.	Physiology of plants	3,0	exam
	Ecological safety		
	Dendrology		
	Macroeconomics		
	Composition and colour study		
OB 2.7.	Soil science and basics of geology	3,0	exam
	General ecology		
	Economics of enterprise		
OB 2.8.	Agrochemistry	4,0	exam
	Monitoring of environment		
	Forest zoology		
	Money and credits		
	Aesthetics		
OB 2.9.	Selection and seed growing	4,0	exam
	Social ecology		
	Mechanization of forestry		
	Management		
	Phytodesign		
OB 2.10.	Forage producing and grass-farming	4,0	exam
	Chemistry and biogeochemistry		
	Forest phytopathology and entomology		
	Marketing		
	Folklore		
OB 2.11.	Phytopathology	4,0	exam
	Ecological analysis		
	Forestry		

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

	Organizing of production		
	Basics of arrangement		
OB 2.12.	Fruit and vegetable growing	6,0	exam
	Ecological protection of agrosytsems		
	Forest melioration		
	Agricultural management		
	Ukrainian and foreign culture		
OB 2.13.	Plant cultivation	6,0	exam
	Environmental protection and sustain environmental management природССористування		
	Forest crops		
	Finances		
	Decorative floristic		
OB 2.14.	Mechanization, electrification and automation of agricultural production	4,0	exam
	Management of quality of agricultural products		
	Organising of forestry production		
	Tax system		
	Decorative art		
OB 2.15.	Technology of storing and processing of plant growing products рослинництва	3,0	exam
	Ecological legislation		
	Basics of forest exploitation		
	Auditing		
	Theory and methodology of design		
<b>The volume of components of the special (professional) training cycle</b>		<b>160</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC25.	Studying pedagogical practice	3,0	
CC26.	Studying technological practice	4,0	
CC27.	Industrial technological practice	4,0	
CC28.	Industrial pedagogical practice	2,0	
CC29.	Bachelor thesis or project	2,0	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Valeology and the Science and fundamentals of medical knowledge.** Health culture; the formation, preservation and strengthening of health of the person in spiritual, mental and physical aspects, hardening of the body, strengthening of physical and mental health; balanced nutrition, organization of work and rest. The first aid in threatening life conditions, occurring at diseases of internal organs, infectious diseases, injuries, and accidents.

**Personal eco-culture and psychology of work.** To familiarize students with the regularities of the labour process, the psychological requirements of the individual employee; to reveal the content and place of labour psychology in the system of scientific knowledge, the history of its formation, laws, principles, approaches, methods, psychological meaning of work; to do psychological problems of work incentives and motivation, problems, progress, performance, and professional potential of the modern worker, self-realization in various types of professional activities, as well as the psychological problems of study of the professions in modern social and cultural conditions. The relationship of man and environment, requirements to ecological culture, formation of ecological culture of the individual.

**Leadership and administration.** Deals with the theoretical and practical bases of formation of leadership qualities of future specialists. Analyzes source base of the study of leadership, in particular methods of developing leadership potential of the individual.

**Basics of economic knowledge.** The theoretical part of the course provides students with the knowledge of the basic principles and regularities of the economic system of the country, the applied part deals with the basic provisions of the methods of analysis and calculation of microeconomic and macroeconomic measure.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

**Ukrainian language in professional communication.** The objective of the discipline is the improvement of the level of general language training, communicative competencies of students, practical mastering in the principles of stylistics of Ukrainian language that will provide professional communication at proper language level. The discipline is aimed at generalization and systematization of the knowledge in Ukrainian language, to form abilities and skills for optimal language behavior in professional sphere.

**History of Ukrainian Statehood.** The content of the educational discipline "History of Ukrainian Statehood" is the study of basic stages of formation and development of statehood on the Ukrainian lands, distinctive state building way of the Ukrainian nation. Building of the independent state needs highly skilled, patriotically inclined, socially oriented professionals able to continue the best traditions of the Ukrainians. The response to these circumstances is the study of this discipline in universities. It will allow to master the theoretical course, creatively apply their knowledge in practice and comprehend their own laws of the state building process, orientate in political life and feel their involvement in the state-thousand-year tradition of the Ukrainian people.

**Ethnocultural.** Content «Ethnocultural» due course need comprehensive development of strategic directions of Ukrainian statehood, achieve, the role and place of Ukrainian culture in the context of foreign culture. In the discipline given meaningful information about the origin of Ukrainian, their spiritual culture, economy, life, family. The realization of economic, social and political reforms require an appropriate level of human and national culture. Only through the mind of the individual, because of its high ethical and patriotic feelings may be real change in Ukrainian society.

**Philosophy.** The course introduces the system of knowledge in such fields of philosophy as ontology, gnoseology (theory of cognition), social philosophy, historical types of philosophy that explain the essence of relation "a human-being – the world" in its most important manifestations. The course is characterized by world outlook orientation which allows to synthesize obtained knowledge of special and humanitarian disciplines in integral conception of the world – theoretical basis of university level of specialists training.

**Foreign language (English, German, French, Spanish).** The course develops communicative competency in students, especially the use of skills, abilities and knowledge of foreign language during business communications with the representatives from other countries specialized in various issues concerned business and labor market in agriculture, preparation to the participation in international conferences, projects and discussions as well as making presentations, business correspondence (formal and informal letters, c.v., various kinds of research articles and reports), in such way contributing into versatile development of student's personality and his/her socialization in a society speaking another language.

**Legal culture of a personality.** One of the features of a legal state is the high level of legal culture of the citizens characterized by the common respect to the law, sufficient awareness of its norms and the ability to apply them in all life situations. The discipline «Legal culture of a personality» will permit students to develop legal thinking and cultural style of legitimate behavior in everyday life in interpersonal relations as well as in communication with representatives of court and law enforcing authorities.

**Latin language.** Mastering the Latin language knowledge, as well as skills needed to translate Latin texts and using Latin terminology in training, scientific and production activity.

**Physical education.** The aim of the discipline is formation of physical culture of junior specialist and the ability to realize it in social and professional training and in family life. The objectives of the discipline are to improve students' health and develop physical abilities in accordance with the professional activity of a future specialist.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**General and professional pedagogy.** Theoretical foundations of pedagogy as a science about education of the person, basic categories, laws and principles; the nature and pedagogical requirements for the content of general and vocational education, the general methods and means of training and education, forms of organization of teaching process in secondary and vocational schools; fundamentals of management of educational process in secondary and vocational schools; formation of readiness of students to pedagogical activity, interest in the teaching profession.

**Organization of educational work.** The formation of students' scientific concepts about the theory and methodology of teaching, its aims and objectives; assistance to trainees in mastering the basic theoretical knowledge and practical skills in the education of the individual and of the team and training them to apply these knowledge and skills in future teaching activities; introducing the future teachers to the methodologies of research and education of the individual, the work of supervisor of student group on team-building, developing and carrying out educational activities.

**Management of the educational establishment.** Providing a more holistic model of a specialist – the head of the institution through the acquisition of legislative-normative, methodological, theoretical, organizational, and technological knowledge and acquisition of diagnostic and predictive (modeling), organizational, regulatory, control and corrective skills that correspond to basic management functions.

**Basics of scientific and pedagogic research.** Introducing students to contemporary methodological problems of science; the main stages of scientific and pedagogical research; methods of socio-pedagogical research; forming in students the concept of methodology of scientific research; mastering the basic theoretical knowledge and practical skills of organizing, conducting scientific and pedagogical research;

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developing the ability to summarize the results of scientific research; developing the scientific worldview of students.

**Psychology.** General issues of psychology, especially the development of psyche in phylogenesis and ontogenesis, the driving force of development of psyche, mental processes, mental states and personality traits.

**Basics of pedagogical mastery.** The course aims to develop skills of pedagogical activity, to promote the enrichment of the educational experience of future teachers, knowledge of pedagogy and psychology, innovative educational technologies, culture of pedagogical communication; to create conditions for the accumulation of experience of the optimal combination of basic education with learning the art of communication; formation of practical teaching skills, pedagogical culture and erudition. The course provides familiarization with the basics of the teaching process; the study of the peculiarities of pedagogical interaction; the improvement of pedagogical abilities of students; mastery of methods of training and education; familiarization with the basics of teaching in higher education.

**Pedagogical technologies.** The aim of the course is to develop the students' scientific knowledge about educational technologies in education, their goals and objectives; to help future teachers in mastering the basic theoretical knowledge and practical skills to apply new pedagogical technologies in the educational process and to teach them to apply the knowledge and skills in future teaching activities.

**Legislation of Management of educational establishments.** The purpose of discipline is to provide the students with advanced theoretical and practical knowledge on the legal bases of foundation and activities of educational institutions of Ukraine of all levels, as well as the formation of skills of practical application of norms of the current legislation at positions in educational institutions.

**New innovation technologies.** The course program reveals the use of basic innovative educational technologies, their principles, methods, types and activities. It deals with the regularities and fundamental problems of the use of innovative educational technologies by the future teacher. Much attention is paid to pedagogical culture, communication styles, advanced educational technologies, teaching techniques in higher education in the form of mini-lectures with multimedia presentations, training exercises, and the creation of a program for professional development.

**Introduction to speciality.** The discipline outlines the main tasks and functions of the professional learning teacher, requirements to his personality and the organization of labour conditions.

**Pedagogics of family education.** The aim of teaching the discipline is to develop scientific knowledge on the theory and methodology of family education, its goals and objectives, problems and prospects of development of the modern family, its functions and types, characteristics of social work with problem and young families; assistance in mastering the basic theoretical knowledge and practical skills to educate the individual in the family.

**Foreign history of pedagogics and education.** The discipline studies the relationship between the educational ideas of theorists and practitioners, tradition and innovation in the development and implementation of pedagogical ideas; ideas and contribution of an outstanding teacher in the theory and practice of training and education; socio-historical conditions that have affected the worldview and pedagogical beliefs of a scientist-teacher, led to his contribution to the development of the theory of pedagogy.

**History of pedagogics and education in Ukraine.** The academic discipline discloses the process of the development of education, school and pedagogical thought from ancient times to the present day in Ukraine in the context of the development of the world's historical and pedagogical process, the regularities of the historical development of schools and education in Ukraine, peculiarities of formation and nature of the major pedagogical theories in the different stages of social development.

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**Teaching technologies of professional subjects.** The purpose of the discipline is to provide students with the knowledge and skills of the organization of the educational process for the study of professionally oriented disciplines at higher educational institutions

**Basics of career-guidance.** The discipline is aimed at the study of theoretical problems of vocational guidance of youth, the characteristics of the role and place of secondary school in the process of career guidance, learning basic patterns, trends and structures of the organization of vocational guidance work of the vocational training teacher; providing the future organizers of career guidance with modern techniques and practical skills necessary for successful professional activity.

**Comparative pedagogics.** The purpose of the discipline is formation of theoretical knowledge of major paradigms, trends of the development of education in the world, skills to apply the obtained knowledge in pedagogical activity, creative approach to solving any educational problem. An important emphasis in the course is put on the study of forms and methods of socializing influence of the modern school.

**Pedagogical ethic.** The objective of the course is to familiarize students with the definition of the essence of a number of concepts (ethics, moral consciousness of the high school teacher, the ethical principles and values of pedagogical activity, moral duty and responsibility of the teacher, pedagogical justice); historical characteristics of the development of pedagogical ethics, peculiarities of the moral consciousness of the teacher; the basic moral and personal qualities that should be developed in the teacher; ethics and principles of professional activities of teachers; psychological and pedagogical foundations of moral self-improvement of teachers.

**Basics of eloquence.** The discipline makes students familiar with the basic laws of speech activity, its mechanisms, patterns, methods and techniques, mastery of practical skills of creating a persuasive and effective speech, a multifaceted possibilities of the art of the word, the emotional and intellectual interaction with the listener with the aim of pedagogical influence on him as a person.

**Social work in entertainment sphere.** The course examines conditions of social formation of personality engaged in leisure activities, peculiarities and organization of social and educational activity with different groups of children and young people who need assistance, support and protection through leisure activities.

**Age and pedagogical psychology.** The course provides knowledge of the peculiarities of mental, personal development at different stages of life, the use of psychological potential of a teacher and a student in the process of learning, upbringing, acquiring social experience.

### **Optional components**

#### ***Optional Block 1 (Student's Choice)***

***Technology of production and processing of crop production.*** The main purpose of discipline is to provide knowledge to create optimal process (agro-ecological) conditions of the required number of high-quality crop production based on intensive photosynthesis in crops field crops while maintaining or improving soil fertility. The key task of it is: getting practical skills in production high-quality, environmentally friendly products with minimal energy and labor costs while maximizing its output per unit time per unit area that requires large-scale introduction of high-grade, intensive, energy-saving and environmentally appropriate technologies. The purpose of discipline is giving future marketing specialists professional knowledge of the main characteristics of the product, from a stage production and finishing of pre-sale preparation. The discipline studies technological regulations that determine the quality of products and by its price parameters. Students acquire practical skills with the products, allowing their careers to forecast supply and demand for it.

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**Fundamentals of Business-Designing.** The peculiarities of the fundamentals of business-designing, basic information on starting own occupation and own business are considered. The essence of economic phenomena and processes in business-designing, a comprehensive analysis of the agrarian sector and the international market of agricultural products, the exchange and consumption of material and spiritual goods in society.

**Technology of production and processing of crop production.** The main purpose of discipline is to provide knowledge to create optimal process (agro-ecological) conditions of the required number of high-quality crop production based on intensive photosynthesis in crops field crops while maintaining or improving soil fertility. The key task of it is: getting practical skills in production high-quality, environmentally friendly products with minimal energy and labor costs while maximizing its output per unit time per unit area that requires large-scale introduction of high-grade, intensive, energy-saving and environmentally appropriate technologies. The purpose of discipline is giving future marketing specialists professional knowledge of the main characteristics of the product, from a stage production and finishing of pre-sale preparation. The discipline studies technological regulations that determine the quality of products and by its price parameters. Students acquire practical skills with the products, allowing their careers to forecast supply and demand for it.

**Higher mathematics.** The course provides students with knowledge of the main branches of higher mathematics in correspondence with the direction of their training: definitions, theorems, rules, development of skills to formulate learning objectives and construct their mathematical models, choose methods of research of the constructed models, conduct quantitative analysis by applying precise or approximate methods of calculations, modern computing equipment, process numerical experimental data by applying methods of mathematical statistics, analyze the data and evaluate the results obtained.

**Physics.** Physical fundamentals of mechanics, fundamentals of molecular physics and thermodynamics, constant electric current, electromagnetism, electromagnetic oscillations and waves.

**Floriculture.** The discipline "Floriculture" involves studying biological and ecological features of the development, propagation and farming of flower-ornamental crops of unprotected soil, mastering theoretical knowledge of growth and development peculiarities of annual, biennial, perennial flowers and decorative plants, used to make different types of flowerbeds, gaining practical skills in their breeding and planting, flower development projects. The study of cultivation technology in protected ground is provided in the second part of the course.

**Botanic.** The course focuses on learning the patterns of plant growth and vegetation as the most important bioenergetic component of the biosphere. The students obtain skills of working with a microscope, producing preparations and making their cellular and tissue analysis, as well as the analysis of separate organs and the whole organism.

**Meteorology and climatology.** Formation of knowledge about the key meteorological factors, properties and physical processes, meteorological phenomena and mechanisms; gaining skills in assessment of synoptic weather, meteorological factors of influence on agro sphere, the use of meteorological observations for complex ecological analysis of the environment and making of important ecological decisions.

**Informatics.** The purpose of the course is to develop knowledge in principles of computer construction and operation, organization of computing processes on personal computers and their algorithmization, both PC software, computer networks, and effective use of modern information and communication technologies in professional activity. The main objectives of the course is to study theoretical foundations of computer science and to master skills in applied systems using of economic data processing; PC programming systems; computer networks in the process of social and economic systems studying. It provides the study of four informative modules: the architecture of modern computer, modern text

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information processing software, operations with MS Excel spreadsheet software and advanced software for processing graphic data.

**Chemistry**. Theoretical principles of modern inorganic chemistry and peculiarities of chemistry of biogenic elements. The chemical processes involving these elements and their compounds are considered from the standpoint of electrolytic dissociation, hydrolysis, redox processes and possibility of forming complex compounds. The basics of qualitative and quantitative chemical analysis. Quantitative methods of gravimetry, acid-base titration, redoxmetry, complexometry. The study of physical and colloid chemistry includes the issues of thermodynamics, thermochemistry, theory of solutions, chemical kinetics and catalysis, the principles of highly dispersed state of substances, surface phenomena and adsorption.

**Geology and basics of geomorphology**. Formation of knowledge about creation of typification and classification of the forms of relief and geo morphological division into districts of the territory, interrelations and correlation between geological structures and morphology of relief; ability to establish interrelations of soil formation factors, identify erosion processes under various soil climatic and geo morphological conditions, evaluate anti erosion measures and their role in improvement of the environment.

**Microeconomics**. The aim of the discipline is formation of market oriented outlook, knowledge and skills as to finding out the mechanisms of establishment and renewal of the balance of micro systems and increase of the efficiency of economic entity activity. In order to achieve the aim there are the following tasks: understanding of reasons, key regularities and methodological principles of behavior of economic entities under the market conditions at micro level; mastering of universal tools for self analysis and substantiation of making optimal economic decisions under the conditions of insufficiency of means and availability of alternative possibilities.

**Ethics and etiquette**. Morality as a social phenomenon, as a cultural phenomenon and as a form of worldview is considered, moral issues of human consciousness, activity and communication have been highlighted. Internal, existential aspects of morality, the issues of good and evil, responsibility, sense of life, happiness, justice and love has been revealed. A number of actual ethical issues including correlation of moral and law, morality and politics, national and universal moral values.

**Farming**. The course covers the scientific principles of arable farming and their practical implementation; soil fertility reproduction, general concepts about weeds and methods of crop protection; theoretical principles of crop rotation and their practical application in different soil-climatic zones of Ukraine and in farms with different forms of ownership; theoretical principles of soil tillage and protection from erosion; arable farming systems and their zonal characteristics.

**Biology**. The course provides the knowledge about the impact of economic activities on natural habitats, most common higher plant species of flora and regional plant communities, methods of floristic and phytocenological research; skills of conducting geobotanical description of meadow, forest and anthropogenic phytocenoses, the study of plants-indicators of various types and habitats; identifying reservators of viral infections in agrocenoses.

**Geodesy**. General geodesic concepts; orientation of lines on the locality; coordination in geodesy; theodolite survey; ways of calculation of plots area; geometric levelling; engineering projecting according to the profile; levelling of surface; locality relief; topographic map; classification of maps; task solving on a topographic map; tachometric survey; the principles of aerial mapping and decoding of aerial photographs; topographic and geodesic works in forest management.

**Accounting**. The purpose of the discipline is to form knowledge system in theory and practice of accounting in the enterprise. The main objectives of discipline "Accounting" is to study methods, rational organization and accounting in enterprises based on the use of

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advanced forms and national standards; to master skills of processing and use of accounting information in management.

**Painting.** The curriculum reveals the most essential things that a beginner-artist should know; the intricate details of the landscape: water, mountains, atmospheric phenomena, sky, forest, separate tree. It reveals skills to use art of color, technique of painting, still life, images of human being and landscape.

**Physiology of plants.** The discipline studies the main physiological processes in plants, physiology and biochemistry of plant cells, water exchange of plants, photosynthesis, respiration, mineral nutrition, plant growth and development, plant resistance to adverse conditions.

**Ecological safety.** The course provides knowledge of fundamental and applied aspects of ecological safety of the environment, abilities and skills in using methods and techniques of assessing the impact on the environment, identification of risks of emergencies, processing, analysis, systematization and generalization of information on environmental security.

**Dendrology.** Plant ecology. Species, interspecific systematic units. Area types. Vital forms and cycles. Phylogenetic system. Dendro flora of Ukraine. Plant introduction. Phytocoenology. Forest formation and association.

**Macroeconomics.** The aim of the discipline is giving deep theoretical knowledge in the issues of functioning of the economy – the important sphere of human vital activity, the effect of objective economic laws, introduction of methods and conditions of efficient economic activity and the whole systematic concept of macroeconomic theory and policy.

**Composition and colour study.** Composition, painting, anatomy, perspective, drawing and chromatics are studied by future artists.

**Soil science and basics of geology.** The course studies the origin, development, structure, composition, properties and regularities of geographical distribution of soils, ways of their rational use and restoration of fertility.

**General ecology.** Ecology gives an idea of how to achieve the symbiosis of technology, production and nature – nowadays these are not coordinated enough biosphere and sociosphere components. The program shows the contents of general ecology, its place in the natural sciences is determined; history of environmental science has been submitted. The sections of the discipline are set out in hierarchical order: autecology (organism ecology), population ecology, biocenology (synecology), biogeocenology (ekosystemology) and biosphereology (global ecology). The course considers applied environmental issues – natural, social and technological.

**Economics of enterprise.** Economic mechanism of functioning of an enterprise, formation and use of its resource potential with aim of optimization of economic performance.

**Agrochemistry.** The course focuses on theoretical and practical nutrition and fertilisation of crop plants. The discipline studies the chemical melioration of soil, characteristics of organic and mineral fertilizers and their use, the balance of nutrients, the use of fertilizers in crop rotation, the combination of fertilizers and plant protection means, the environmental aspects of fertilizer application.

**Monitoring of environment.** Formation of knowledge about the system of state monitoring of the environment, monitoring of atmospheric air, water objects of agro sphere, soil ecological monitoring, phito sanitary monitoring of pests in agrocoenosis; skills and ability to conduct ecological and land reclamation monitoring of irrigated and dried soils, to determine the extent of diseases prevalence.

**Forest zoology.** Species and peculiarities of expansion of representatives of forest fauna; the consequences of anthropogenic effect on forest; the examples of positive and negative effect of mammals and birds on forest environment; the understanding of the reasons of extinction of animals and the ways of their preservation; the principles of legislation as to animal preservation.

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**Money and credits.** The purpose of the course "Money and Credit" is to provide students with theoretical and practical knowledge in organization cash flow management, to form students' theoretical basis for the next practice mastering in monetary instruments use in the regulation system of Ukrainian economy. It is important to study economic relations with money turnover, including as a means of circulation and use of credit relations in modern economy.

**Aesthetics.** At the level of the modern scientific understanding of the aesthetic and artistic knowledge the history of world and aesthetic thought, peculiarities of its status at the Ukrainian and Russian groundwork has been highlighted; the subject content, its goals, objectives and functions of aesthetics as a science have been defined. Aesthetics categories, specific structure of aesthetic activity and features of aesthetic consciousness have been characterized. Art as a social phenomenon, its morphology, development patterns and historical typology have been analyzed. The nature, characteristics and personal aesthetic culture and system of aesthetic education has been revealed. The importance of aesthetic culture in common human culture has been founded.

**Selection and seed growing.** The course focuses on the current status and achievements of selection, the requirements to agricultural production of varieties and hybrids, tasks and directions of selection, technologies of selection process, modern methods of creating new varieties and hybrids of field crops.

**Social ecology.** Formation of knowledge in the reasons, scales and consequences of national nature management, finding the ways of overcoming of current crisis under the relations of society and nature, social and ecological consciousness, new ethical treatment of a human-being to the nature; ability and skills to develop the principles of management of anthropogenic and natural ecosystems.

**Mechanization of forestry.** Construction of soil cultivation and seed gathering, sawing, forest planting machines. Machines for forest preservation and protection. Mechanization of cutting of forest inspection. Gathering of machine and tractor aggregates.

**Management.** The system of knowledge of management essence in enterprises and organizations of agroindustrial complex and production processes management skills; conditions for business structures efficiency; diagnosis and designing system of agricultural management, adequate to goals and objectives of market economy in agriculture. The objective of discipline is to train future professionals able to streamline the organizational structure and to develop management system in enterprise (organization), to maintain their resilience and capacity, to ensure enterprise dynamic development and competitiveness, which precedes theoretical training of students for management and agricultural management.

**Phytodesign.** The discipline reveals the issues related to chromatics, composition, color characteristics of plants, methods of designing and constructing in phytodesign, features of ornament use, planting principles of various types of accommodation with plants and cut crops, varieties of flowers and ornamental plants, arranging methods of winter gardens, balconies etc.

**Forage producing and grass-farming.** The course provides knowledge about science-based system of organizational, biological, technological and economic approaches to production, harvesting and fodder storage; the system of organizational measures and technological methods aimed at improving productivity of natural grasslands, cultivating seeded grasslands and pastures and their rational use.

**Chemistry and biogeochemistry.** Formation of knowledge in bio geo chemical aspects of biosphere and their functioning principles, migration types, biological circulation and bio geo chemical cycles of live matter; ability to apply methods of bio indication of the environment for bio geo chemical division into districts, forecast measures as to getting high quality ecofriendly agricultural products; to analyze bio geo chemical situation of endemic regions; to work out the recommendations for optimization of anthropogenic landscapes with

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the aim to minimize the negative effect of human activity and keep balance between the components of ecosystems.

**Forest phytopathology and entomology.** Pathogenic agent of seedlings, plantations, needles, leaves and their symptoms. Root and trunk rotten. House, edible and poisonous mushrooms. Methods and measures of forest protection. Technology of forest protection. Biology, systematization and classification of insects. Ecological factors and trophic relations. Methods and measures of plantation protection. Needle and leaf suckers, trunk pests. Seeds, seedlings, young plantations and wood pests.

**Marketing.** Studying and mastering in theoretical knowledge and practical skills as to application and use of market tools; organization, planning, managing agro marketing activity of AIC enterprises. The aims of the discipline "Marketing" are to obtain knowledge in the sphere of agrarian marketing; market research of agricultural products and foodstuff market; forecasting of market conditions; management of product range of AIC enterprises and their quality; pricing; systems of distribution of agricultural and foodstuff products; promotion of foodstuff on domestic and foreign markets; as well as obtaining knowledge in the sphere of planning of agrarian marketing, management and control of agro marketing activity.

**Folklore.** The discipline highlights the development of folk art from the origins to the present, text peculiarities under certain historical conditions. A new periodization and classification of folklore genres with current research of history, ethnic psychology, cultural study, and mythology has been suggested. Each folk art phenomenon is seen in its correlation with fiction.

**Phytopathology.** The course studies the disease processes in plants, their causes and methods of combating them.

**Ecological analysis.** Formation of knowledge about normative and legal support of ecological expert activity, general requirements to conducting ecological expertise, the peculiarities of conducting geo ecological expertise as the new research and practical activity in evaluation of mechanism of co-adaptation of natural and economic subsystems, procedures and methods of conducting of geo ecological expertise; ability to conduct ecological expertise of technologies, raw materials and products.

**Forestry.** Practical silviculture. Systems and ways of forest cutting. Cutting inspection. Increase of forest productivity.

**Organizing of production.** The purpose of the discipline is to give future specialists and managers of agricultural sector in agribusiness scientific knowledge on effective organization of agricultural production in the conditions of mixed economy and the development of market relations. Knowledge of organizational, economic, legal and social aspects of new types of businesses, farming methods, internal economic relations in enterprises, which this discipline teaches, is particularly important nowadays.

**Money and credit.** The purpose of the course "Money and Credit" is to provide students with theoretical and practical knowledge in organization cash flow management, to form students' theoretical basis for the next practice mastering in monetary instruments use in the regulation system of Ukrainian economy. It is important to study economic relations with money turnover, including as a means of circulation and use of credit relations in modern economy.

**Basics of arrangement.** The purpose is to master skills of creating floral arrangements due to the laws and principles of design using natural living, canned or artificial plant material. Getting theoretical and practical knowledge of the plants selection, their preparation, conservation and modification rules, composition basis of flower arrangement. Objectives: During the course students must learn the layout of the plant material according to the basic rules of composite decisions in the European flower design.

**Fruit and vegetable growing.** The course focuses on the importance of fruit and berry plants, their morphological and biological characteristics, methods of reproduction, rootstocks, the structure of a fruit nursery and technology of growing seedlings, installing fruit

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plants, maintenance and soil cultivation systems in gardens, plant fertilization and irrigation, shaping and pruning fruit trees, crop care and other types of work in gardens, preparing and harvesting technology, biological characteristics and crop cultivation technologies. The lectures cover the biological bases of vegetable crops, peculiarities of soil preparation and fertilization, plant reproduction, cultivation of seedlings for open ground, general measures for plant care, harvesting, and principles of vegetable crop rotations. In laboratory and practical classes students study morphological characteristics of vegetable crops, their classification, the species composition of seeds, their germination, reproduction methods, estimate the requirements for the seedlings of seeds of various crops.

**Ecological protection of agrosystems.** Formation of knowledge about structure and functioning of agricultural ecosystems, methods of optimization of agricultural landscapes, prognosis of the development of crop diseases in agrocoenosis; ability to identify and keep records of pests and pathogenic agent, forecast their development, optimize agro landscape based on contour land reclamation organization of agricultural lands.

**Forest melioration.** The key forestry and forest melioration principles that determine technology of creation and growing of protective forest plantations. Soil erosion and its prevention. Agro technical peculiarities of creation and growing of forest melioration plantations on erosion soils. Sands, their fastening and assimilation.

**Agricultural management.** The main goal of the discipline is to develop the students' managerial thinking and systems of specific knowledge in the field of agricultural management, to form an understanding of the conceptual bases of agricultural organizations management; to acquire skills of internal and external environment analysis.

**Ukrainian and foreign culture.** Fundamental achievements of the national culture as an integral process of global cultural environment have been analyzed. Unity and diversity of the Ukrainian and world cultures, the role and importance of culture in life, creativity and self-identity in the humanization of social relations have been revealed. The development of Ukrainian culture covers the period from its sources to new aspirations of integration into the global cultural environment.

**Plant cultivation.** The course provides knowledge about cultivation of grain, potatoes, sugar beet, sunflower seed and other crop products. The knowledge basis is field crops, peculiarities of their growth and development, requirements to environmental factors, up-to-date methods and technologies of obtaining high yields of quality products with the minimum costs of labor and resources. The students obtain the knowledge about the state and prospects of development of plant cultivation, its importance, morphological and biological characteristics of field crops, modern technologies of cultivation, including intensive ways and means of improving the quality of agricultural products, reduction of labor costs and means of crop cultivation.

**Environmental protection and sustain environmental management.** The course provides acquisition of knowledge and professional skills in fundamental and applied ecology, protection of environment (in different sectors of the economy), ability to respond to environmental challenges through implementation of environmental scientific research and expert control methods for ecological forecasting, environment engineering, environmental control, monitoring, certification, auditing, assessment and inspection of various components of the environment, to predict, prevent and eliminate environmental risks and hazards on the local, regional, national and global levels.

**Forest crops.** Issues of forest seed business, organization of forest seedbeds, the peculiarities of growing of planting stock, forest cultures division into districts, creation and growing of cultures of main forest creation and precious tree species. Forest seed business, planting stock, forest cultures division into districts and technology of creation of artificial forest plantations.

**Finances.** The purpose of the discipline "Finance" is to develop basic knowledge in finance theory, to learn the laws of their functioning on macro and micro levels as the theoretical basis of financial policy and financial system development. The educational purpose of the discipline involves the knowledge gaining in all areas of financial mechanism functioning, namely to form students' conceptual apparatus in finance category to use it in practice; provide information on finances, financial system of the state and its role in economy functioning; to study how to apply their knowledge in practice, to make informed decisions and to solve tasks.

**Decorative floristic.** Varieties of decorative art and design, which is embodied in creating the floral works: bouquets, compositions, pictures, collages and similar works from different natural materials that can be live, dried or canned.

**Mechanization, electrification and automation of agricultural production.** The discipline provides the essential amount of information on functions, structure, design features, working procedures and regulations, operation mode adjustment of agricultural machinery, efficient part kitting and exploitation of tractor units.

**Management of quality of agricultural products.** Mastering of educational principles of technological methods that form quality coefficient of plant products, skills formation in monitoring and application chemicalization means in technological processes of obtaining plant products, preservation and fertility increase of soils considering natural conditions, production market, application of agricultural chemicals with the aim of optimization crop nutrition, productivity increase and obtaining of high quality plant products.

**Organising of forestry production.** Organization of production as applied economic discipline. Forestry enterprises. Labour organization. Remuneration. Organization of the use of production facilities. Organization of forest use, preservation and protection of forests, reforestation, forest industry activity. Operation planning of production activity. Financial support of production. Operation analysis of production activity.

**Tax system.** The purpose of the course is to study out the economic nature of taxes, their essence, functions, objectivity in market conditions; to reveal the contents of tax policy, tax system, tax mechanism and their components, to examine practical mechanism for the application of certain taxes and fees, to master requirements for filling tax returns and tax calculation mechanism. Objectives: To study theoretical and organizational bases of taxation, tax calculation methodology, procedure of tax payment and obligatory payments for legal entities and individuals.

**Decorative art.** For centuries various art handicrafts have been formed: they are wood and bones carving, painting, embroidery, vybiyka, ceramics, casting, stamping, weaving, vytynannya. The best examples of Ukrainian decorative and applied art of different regions absorbed the richness of the human soul and folk talent into their designs, shapes and colors. The course introduces the history and practice of arts and crafts.

**Technology of storing and processing of plant growing products.** The course studies technologies of postharvest treatment of cereals, legumes, cereals, oilseeds, sugar beet, bast-fibre, hops, tobacco, fruit and vegetable, short-term and long-term storage, principles of processing, and finalizes the study of technologies of cultivating cereals, legumes, technical, vegetable, fruit and berry crops.

**Ecological legislation.** Study of the system of current ecological legislation as well as ecologic and law issues of the science of ecological law; study of the system of current nature resources legislation, key issues concerning the land use, water use, resource use, forest use, the use of atmospheric air, flora and fauna; study of the system of current nature resources legislation, key issues concerning land, water, resources, forests, atmospheric air, flora and fauna protection.

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**Basics of forest exploitation.** Logging resources. The main phases of forest exploitation. Organization of logging works. The principles of theory of wood processing. Ways of wood transportation. Efficiency of lumbering and wood processing machines and mechanisms.

**Auditing.** Peculiarities of application of element of organization, registers of synthetic and analytic accounting. Accounting of finance, calculations, tangible resources, main instruments, intangible assets, salary and wage, systems, alternative spending on production, calculation of product cost. Functions of audit: verification of accuracy of balance statement and income and losses statement, analysis of the state of accounting, its conformity to the legal requirements; compliance of equality of shareholders' rights when distributing dividends and voting.

**Theory and methodology of design.** The course aims to examine issues of industrial (technical) aesthetics and design development, issues of science synthesis, technology and art, correlation of beauty and functionality in material culture, principles of color design, use of qualimetric methods for aesthetic evaluation of design objects.

**Bachelor**  
**Field of Knowledge «Journalism»**  
**In Specialty «JOURNALISM»**  
**Educational-professional program «Journalism»**

Form of Training:	Licensed number of persons:
– Full-time	50
– Part-time	-
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian, English
Qualification	Bachelor in Journalism

**Training Concept**

Training of specialists in the field of "Journalism" is determined by the urgent need to provide the agrarian sector with highly qualified journalists, competitive in the national and international labor market, the formation of key competencies necessary for self-fulfillment, active citizenship, which meet the needs of the state, the economy and the goals of the Ukrainian village, national, cultural and universal values.

**Practical Training**

Practical training is an integral part of the training of journalists and is carried out according to the schedule of the educational process. Practical training of students is carried out on appropriately equipped bases, among which the SSD NULES of Ukraine "Velykonytynske educational and research farm named after O.V. Muzychenko", "Educational and Research Farm "Vorzel", "Agronomic Research Station", "Boyarska Forest Research Station"; TRC Branch of the National Television Company of Ukraine "Ivano-Frankivsk Regional Directorate" KARPATY", "Literary Ukraine" newspaper, All-Ukrainian cultural weekly "Word of Enlightenment", LLC "General policy publication "Rural News", newspaper of protection of Ukrainian peasants' interests", the National public policy magazine "Volunteer", Translation Agency "Lingvo-Apostille", Ministry of Agrarian Policy and Food of Ukraine, Ukrainian Research Institute of Agro-Industrial Complex, Informational Agency "GO AZOV-PRESS", Apollo (Exchange Program in Agriculture and Ecology, Germany), StizhtingUtwisseling (SUSP) Netherlands Educational Programs Agency, Association "Friendship Without borders "(France).

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

**Employment of Graduates**

A journalism specialist can work in mass media: newspapers, magazines, television and radio companies, online publications, press and news agencies, press centers, public relations services.



**Bachelor`s Program and Curriculum  
in Specialty «Journalism»  
Educational-professional program «Journalism»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1.1	Ukrainian and world culture	4	exam
CC 1.2	Information and civil law	4	exam
CC 1.3	Modern agrarian production and mass media	4	exam
CC 1.4	Practical stylistic	4	exam
CC 1.5	Oral Broadcasting Technique	4	exam
CC 1.6	Culture of broadcasting	4	exam
CC 1.7	Culture of writing speech	4	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian Statehood	4	exam
OB 1.2	Modern Ukrainian language	9	credit, exam
OB 1.3	Foreign language (for professional purposes)	14	credit, exam
OB 1.4	Philosophy and logic	4	exam
OB 1.5	Safety of Vital Activity	4	exam
OB 1.6	Basics of the scientific research	4	exam
OB 1.7	Physical education	8	credit
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1	Administrative-territorial reform and mass media	4	exam
OB 2.2	Latin language	4	exam
OB 2.3	Diplomatic protocol	4	exam
<b>The volume of components of the general training cycle</b>		<b>87</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 2.1	Agency journalism	4	exam
CC 2.2	Introduction	5	exam
CC 2.3	Basics of Journalism	4	exam
CC 2.4	Photojournalism	4	exam
CC 2.5	Newspaper production	4	exam
CC 2.6	Radioproduction	4	exam
CC 2.7	Television Production	4	exam
CC 2.8	Cross-Media and Journalism	4	exam
CC 2.9	Professional standard of journalistic activity	4	exam
CC 2.10	The History of Ukrainian Journalism	6	credit, exam
CC 2.11	History of foreign journalism	4	credit, exam
CC 2.12	Literary editing	4	exam
CC 2.13	Media Regulation	4	exam
CC 2.14	The theory of mass communication	5	credit, exam
CC 2.15	Communication technology	4	exam
CC 2.16	The Theory of Journalism	5	exam
CC 2.17	Theory of work and text	4	exam
CC 2.18	Media Criticism	4	exam
CC 2.19	Information genres in print press	4	exam
CC 2.20	Analytical journalism	4	exam
<b>Optional components</b>			
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1	Genres in Internet media	4	exam
OB 2.2	Java Programing	4	exam
OB 2.3	International standards in the information sphere	4	exam
OB 2.4	The right of the Council of Europe and journalism	4	exam
OB 2.5	Ukraine and the international information space	4	credit

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.6	Problems of agrarian development in Ukrainian and international mass media	4	exam
OB 2.7	Legal discourse in the media	4	exam
OB 2.8	Virtual Newsroom	4	exam
OB 2.9	Case-law texts in crossover communication	4	exam
OB 2.10	International Journalism	5	exam
OB 2.11	Journalistic investigation	4	exam
OB 2.12	Multimedia Products	4	exam
OB 2.13	The Constitution of Ukraine and the practice of the European Court of Human Rights (ECHR)	4	exam
OB 2.14	Advertising and PR	4	exam
OB 2.15	Territorial communities and information resources	4	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>146</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
CC 3.1	Academic (orientation) practice	2	
CC 3.2	Production practice	2	
CC 3.3	Production (journalistic) practice	1	
CC 3.4	Production (pre-diploma) practice	1	
CC 3.5	Complex state exam	1	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

## Annotations of Components in the curriculum

### 1. GENERAL TRAINING CYCLE

#### Compulsory components

**Ukrainian and world culture.** Culture of primitive time. Culture from the times of the Ancient East to the time of the Enlightenment. European culture of the nineteenth and twentieth centuries. Culture of Kievan Rus. Ukrainian culture of the Lithuanian-Polish period (XIV-first half of the XVII century). Culture of Ukraine from the second half of the XVII century. to the beginning of XX century. Culture of Ukraine in 1917 - the first half of the 40-ies.

**Information and Civil law.** Information law as an independent branch of legal science in the context of human rights and freedoms and in the implementation of European standards in modern media. The concept of civil law of Ukraine, its subject and methods of legal regulation. Sources of Information and Civil Law of Ukraine. Trends of development of civil legislation of Ukraine. The concepts, classification, content and the grounds for the emergence and termination of civil legal relations. Subjects and objects of civil legal relations, their types. Features and procedures for the exercise and protection of civil rights and duties. Concepts and types of transactions.

**Modern agrarian production and mass media.** The discipline involves studying the foundations of modern agricultural production, which occupies a dominant position in the export of Ukrainian products. The emphasis is on the peculiarities of coverage of agro-industrial problems, the training of journalists who are professionally capable of providing information support to the processes in the agrarian sector of the economy.

**Practical stylistic.** Theoretical basis of stylistics, actual problems of modern science; stylistic standards of the Ukrainian language.

**Oral Broadcasting Technique.** Features of spoken interaction. Types of mistakes that occur in oral speech. Deficiencies in speaking. Method of oral speech preparation.

**Culture of broadcasting.** Functions and features of broadcasting. Knowledge of orphoetic, accentuation and lexical norms of modern Ukrainian literary language. Requirements for the work of the journalist on the air. The technique of broadcasting. Development of skills and abilities of phantom respiration, articulation, speech accent, diction.

**Culture of writing speech.** Standards for writing. Stylistic differentiation of modern Ukrainian literary language. Structure and requirements for written communications. Requirements for different types of documents. Selection of linguistic means. Analysis and editing of texts.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

**History of Ukrainian Statehood.** The content of the educational discipline "History of Ukrainian Statehood" is the study of basic stages of formation and development of statehood on the Ukrainian lands, distinctive state building way of the Ukrainian nation. Building of the independent state needs highly skilled, patriotically inclined, socially oriented professionals able to continue the best traditions of the Ukrainians. The response to these circumstances is the study of this discipline in universities. It will allow to master the theoretical course, creatively apply their knowledge in practice and comprehend their own laws of the state building process, orientate in political life and feel their involvement in the state-thousand-year tradition of the Ukrainian people.

**Modern Ukrainian language.** The objective of the discipline is the improvement of the level of general language training, communicative competencies of students, practical mastering in the principles of stylistics of Ukrainian language that will provide professional communication at proper language level. The discipline is aimed at generalization and systematization of the knowledge in Ukrainian language, to form abilities and skills for optimal language behavior in professional sphere.

**Foreign language (for professional purposes).** The course develops communicative competency in students, especially the use of skills, abilities and knowledge of foreign language during business communications with the representatives from other countries specialized in various issues concerned business and labor market in agriculture, preparation to the participation in international conferences, projects and discussions as well as making presentations, business correspondence (formal and informal letters, c.v., various kinds of research articles and reports), in such way contributing into versatile development of student's personality and his/her socialization in a society speaking another language.

**Philosophy and logic.** The course provides the system of knowledge in such branches of philosophy as ontology, gnoseology, social philosophy, historical types of philosophy that explain the essence of relations "a human being – the world" in its main demonstration. The phenomenon of religion, its origin, the main religious concepts, the history and present situations of tribal, early and late national religions, the main principles of religious doctrine and cult of the most influential religions in the world. Method of logics, the main forms and laws of thinking, prerequisites of the origin of current logics, the division of classical logics, typology and analysis of formal and logical theories within the logics of dictum and the logics of predicates.

**Safety of Vital Activity.** General causes of occurrence and evolution of hazards, emergencies. Their properties, the possible impact on human life and health. Safety of life in emergency situations. Organization and management of life safety. Legislation on labor

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protection. Fundamentals of Occupational Hygiene and Industrial Sanitation. Providing the first medical aid. Ensuring healthy working conditions in the national economy.

**Basics of the scientific research.** Principles and methods of organization and implementation of scientific research. General requirements for the execution of scientific research. Ability to work with scientific sources.

**Physical education.** The aim of the discipline is formation of physical culture of junior specialist and the ability to realize it in social and professional training and in family life. The objectives of the discipline are to improve students' health and develop physical abilities in accordance with the professional activity of a future specialist.

### ***Optional Block 2 (Student's Choice)***

**Administrative-territorial reform and mass media.** The discipline provides for the training of journalists, capable to cover reform processes in the regions of Ukraine.

**Latin language.** Mastering the Latin language knowledge, as well as skills needed to translate Latin texts and using Latin terminology in training, scientific and production activity.

**Diplomatic protocol.** The history of diplomatic protocol, specifics of diplomatic negotiations protocol; major diplomatic documents, their analysis.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

**Agency journalism.** The specifics of the activities of news agencies. The role of news agencies in the media space. Principles and criteria for selecting information for messages. Information for writing materials. Creating information products. Work with different sources of information.

**Introduction.** The modern system of world and Ukrainian information markets. The theory of the functioning of the press (the interaction of the press and authorities, the press and society). Basic functions and principles of journalism. Methods of collecting information. Characteristics of genres and genre system of modern press.

**Basics of Journalism.** Theoretical foundations of the journalistic specialty. The difference from the art work, the features of different types of journalism. History of journalism development in Ukraine. The role of the Media in a Democratic Society. The ethics of the media, the journalist's code of professional behavior, his social responsibility. Organization of editorial and publishing work in journalism.

**Photojournalism.** The photo and its variants: history of origin; basic camera settings; basic concepts of photo analysis; types of genres of photojournalism; photojournalism in the system of mass media: newspaper, magazine, Internet publications, advertising; camera angle; composition in photo; illumination (high and low key photos); colors (photos in warm and cold colors); genres of photography; reportage shooting; Bild-editing Photojournalism The photo and its variants: history of origin; basic camera settings; basic concepts of photo analysis; types of genres of photojournalism; photojournalism in the system of mass media: newspaper, magazine, Internet publications, advertising; choice of shooting angle; composition in photography; lighting (high and low key photos); colors (photos in warm and cold colors); genres of photography; reportage shooting; Bild-editing.

**Newspaper production.** Consideration of the main stages of the print media preparation, process review of the publication registration, analysis of the process of organizing work at newspaper and magazine editorial offices.

**Radioproduction.** Specificity of broadcasting, its functionality and place in the media system. Principles of radio journalist's activities. Genre-stylistic spectrum of radio journalism. Features of Interaction with Radio Audience. Technologies for creating high-quality software radio products.

**Television Production.** Phenomenology of television - evolution, functions, specifics. System of genres of modern television. The main directions of modern TV production in Ukraine and in the world. European standards for information broadcasting. Technology for creating a television story. Information package and its structure.

**Cross-Media and Journalism.** Study of peculiarities of cross-media communication. Determining the role of functional information systems in the global media stream. Analysis of the structures of modern international crosstalk systems.

**Professional standard of journalistic activity.** The functions of the journalism in society. Fundamental principles of the journalistic profession. Requirements for the submission of the information: efficiency, accuracy, completeness, balance of opinions and variety of points of view, separation of facts from comments and evaluations, authenticity, simplicity. Journalistic ethics as a specific branch of professional ethics. Sources of journalistic ethics. The journalist's moral consciousness and his position. Categories of journalistic ethics. Ethical values and ethical standards of the journalist. Information rights of a journalist. Professional activity of a journalist and private life of a person. Journalistic activity and informational and psychological safety of society. Corrupt media practices. Network journalist ethics. The ethics of controversy and criticism in the media. The ethics of advertising in the media. Journalistic etiquette.

**The History of Ukrainian Journalism.** Periodization of the journalism formation on Ukrainian lands. Information about the main personalities, individual periods, about their works. Trends in the press systems development. Features of the journalism development. Features of press editions evolution from the initial prototypes to the modern form.

**History of foreign journalism.** The phenomena of prajournalism. History of journalism XVII - XIX century. National features of foreign journalism. European journalism of the twentieth century.

**Literary editing.** Basic concepts of the course "Literary editing"; literary editing and text style; genre text form; linguistic norm and variances; text segmentation and literary editing; clarity of the text; verbalization of the emotional in the text; literary editing of text elements.

**Media Regulation.** Legal bases of mass communication. International documents on the protection of human rights and freedoms. Activities of international organizations on the functioning of mass media, journalists' rights and freedom. Legal principles of mass media activity and development of information space of Ukraine. Domestic legislation on legal regulation of mass media. Activities of state authorities on ensuring the information needs of the society and the development of the information sphere in Ukraine. Freedom of speech in Ukraine: state, problems, prospects of development.

**The theory of mass communication.** The theory of mass communication is the first fundamental-professional discipline that studies the functions of communication, its role and place in the life of society, the natural channels of information transmission, the methods of influence through different sign systems, the state of development of modern mass media, and directs for the conduct of media research, critical thinking, orientation in the problems of the national information space of Ukraine and issues of Ukraine's joining the international information space.

**Communication technology.** Communicative activity. Communication models. Typology of communicative effects. Criteria for effective communication. Structuring information as a condition for the effectiveness of communication. Information comfort. Types and forms of communication technology.

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**The Theory of Journalism.** Basic concepts in the field of journalism. Methodical features of the specialty. Fundamentals of professional ethics and journalism genreology. Legal principles of communicative activity. Methodology of journalism. Types and rules for collecting information. Contemporary philosophical concepts, the subject of which is journalism.

**Theory of work and text.** Concept of the text. Categories of text. The integrity of the text. Linguistic analysis of journalistic text. Linguistic personality, artistic image and image of the author. The main features of journalistic work. The composition of the work. Genre types of journalistic creativity.

**Media Criticism.** History of the establishment and development of media criticism as a special field of journalism in Ukraine and abroad. Forms and genres of works of national media criticism. Functions of media criticism, their correlation with the basic functions of journalism. Specialized editions, sites, web pages.

**Information genres in print press.** The principles and functions of mass media activities are considered; the most important state-building aspects of the functioning of mass communication in Ukraine; the main principles of the journalist's creative process; criteria for the division of journalistic works into genres; destination, genre features, varieties of information genres; basic requirements for materials of information genres; factors of the influence of mass media on the creation and establishment of the Ukrainian information space; the most important aspects of propaganda by means of mass communication of the essence of the Ukrainian national idea of state formation and the formation of people's sense of patriotism, national dignity, civic courage.

**Analytical journalism.** Formation and professionalism. The traditional system of journalistic genres and the modern classification of analytic genres. Review, correspondence, article, letter, modern genres.

## Optional components

### *Optional Block 2 (Student's Choice)*

**Genres in Internet media.** Tendencies of the development of the system of genres of modern journalism. Internet journalism as a new kind of journalism. Offline and online media: general and excellent. Content Types. The genre field of online journalism. The phenomenon of public journalism on the Internet.

**Java Programing.** Structure of programming system Java. Java-machine. Basic data types and operations with it. Instruction syntax and semantics. Characteristics of basic constructions. Means of object-oriented programming language Java. Classes, methods, properties. Syntax of class definition. Class attributes. Class fields. Creation of a particular class object. Abstract classes. Inheritance and interfaces. Syntax of interface. The concept and application of packages. The concept of exceptional situation in Java and its processing. Standard packages of Java programming system. Java - technologies.

**International standards in the information sphere.** The discipline involves studying the standards of objective, impartial journalism, oriented to the protection of human and citizens' rights and freedoms, communication and legal sphere.

**The Right of the Council of Europe and journalism.** The discipline involves studying the standards of the Council of Europe, its criteria and practices for the protection of human rights, the place and role of journalists in maintaining these standards.

**Ukraine and the international information space.** The essence of the information space, the features of its functioning and the impact on the functioning of various spheres of socio-cultural life of the community. Worldwide information flows and their impact on the

state of affairs in Ukraine and around Ukraine. Mechanisms and means of operating information flows and protection against information attacks.

**Problems of agrarian development in Ukrainian and international mass media.**

The course is aimed at studying the problems of agrarian development in Ukrainian and international media, learning its methodology and coverage, understanding the influence of the author's personality on the content and the form of journalistic work within the framework of agrarian subjects; understanding of the features of the modern information space in Ukrainian and international media, learning the mechanisms of searching for information sources.

**Legal discourse in the media.** Ensuring freedom of speech in the state. The formation of a national information space. Study of legal discourse in terms of persuasion and motivation to legal action.

**Virtual Newsroom.** Principles of the virtual newsroom work of the media, its structure and tasks. The range of journalists' duties, methods, forms and methods of activity on the Internet. Legal basis of journalistic activity in Ukraine.

**Case-law texts in crossover communication.** The professional training of a journalist implies a diligent work with the word as the main object of study and as the main means of information transmission. The course focuses on assimilating the methodological principles of constructing and analyzing mass-media texts, taking into account the specifics of cross-media communication, as well as developing skills and practical skills of editorial work with the text while conducting radio and television programs.

**International Journalism.** Journalistic functions. Social position of the journalist. Freedom of the press and journalism. Social position and opportunities for its free sale. Journalism in the system of social institutes, information space. The effectiveness and efficiency of journalism. World trends in journalism. Information sources of foreign mass media. World news agencies. Legal regulation of journalistic activities abroad.

**Journalistic investigation.** The place and role of the journalistic investigation in modern journalism. Genre specificity of investigative journalism. Varieties of journalistic investigations. Technology of Journalistic Investigation. Ethical principles of journalistic investigations.

**Multimedia Products.** Multimedia genres. Multimedia formats. Formation of informational content for Internet media. Features, methods and techniques for creating multimedia news, reports and interviews. Technology for creating publications for various media platforms. Promotion of the media product. Basics of working with multimedia equipment.

**The Constitution of Ukraine and the practice of the European Court of Human Rights (ECHR).** The discipline involves studying the constitutional and international legal guarantees of freedom of speech and information as an indispensable condition for the development of information civil society.

**Advertising and PR.** Advertising: concept, function, purpose and types. Non-verbal means of creating promotional text. Psychological technologies of advertising on different media. Psychology of advertising. Psychology of attitude to advertising. Basic processes of PR. Features of PR in a business organization. Crisis PR. International PR. Technique for writing and giving speeches. PR know how.

**Territorial communities and information resources.** Basic concepts: development, community, resources. Internal resources for the development of the territorial community. External resources for the development of the territorial community. The notion of information resource. Non-standard look at the development of the territorial community and information resources. Communication and information space for the development of the territorial community.

**Bachelors**  
**Field of knowledge «Social and behavioral sciences»**  
**in specialty «Psychology»**  
**Educational-professional program «Psychology»**

Form of Training:	Licensed number of persons:
– Full-time	75
– Part-time	25
Training period: full-time form	4 years
External form	5 years
Credits ECTS	240
Language of studies	Ukrainian, English
Graduates Qualification	psychologist

**Concept of preparation**

The training of a psychologist is determined by the demand of our State for specialists providing psychological assistance to an individual and a group. The professional activity of a specialist of this type involves diagnostics, examination and correction of psychological properties and states, mental processes, various types of human activities in norm and pathology taking into account the features of age stages, developmental crises, risk factors, belonging to gender, ethnic, professional and other social groups.

**Practical training**

Practical training is carried out in accordance with the curriculum schedule, on the basis of certified practice bases, including: centers of practical psychology, counseling centers, social services, law institutions, health and care institutions.

**Graduates' academic rights** – to continue study according to specialties and educational programs (educative-professional or educative-scientific) on masters' training, names of which are given in table 1.2 and 1.3. of the given Catalogue.

**Employment of Graduates**

A graduate can work in educational institutions of all levels and types, enterprises and organizations, health care institutions, centers of practical psychology, social services, consulting centers, research institutions, penitentiary and law institutions for the provision of expert services at the job-place (according to the classification of professions in Ukraine): 2445.2 - psychologist, 2445.2 - practical psychologist, 1232 - chief psychologist, 2412.2 - professional on personnel development, 5131 - tutor.



**Bachelor`s Program and Curriculum  
in Specialty "Psychology"  
Educational and professional program "Psychology"**

Code c/s	Components of the educational and professional program (educational disciplines, course projects (work), practice, qualification work)	Number of credits ECTS	Form the final control
1	2	3	4
<b>1. General Training Cycle</b>			
<b>Compulsory Components</b>			
CC 1	Ukrainian for Professional Studies and Documentation	4,0	Exam
CC 2	History of Ukrainian Statehood	4,0	Exam
CC 3	Philosophy	4,0	Exam
CC 4	Ethics and aesthetics	4,0	Exam
CC 5	Foreign language for Professional Studies	6,0	Exam
CC 6	Ethnocultural studies	4,0	Exam
CC 7	Personality Law Culture	4,0	Exam
CC 8	Fundamentals of Human Biology and Genetics	4,0	Exam
CC 9	Latin	4,0	Exam
CC 10	Pedagogics	4,0	Exam
CC 11	Zoopsychology	4,0	Exam
CC 12	Anatomy and physiology of higher nervous activity	4,0	Exam
CC 13	Psychology of Religion	4,0	Exam
CC 14	Psychology of Sport	4,0	Exam
CC 15	Psychology of Law	4,0	Exam
CC 16	Non-governmental sector and volunteering	4,0	Exam
CC 17	Social Tutorship	4,0	Exam
<b>Optional Components</b>			
<b>Optional Part 1 (according to University choice)</b>			
OP 1.1	Economy	4	Credit
OP 1.2	Modern Information Technologies	4	Exam
OP 1.3	Ukrainian Studies	4	Credit
OP 1.4	Ecology	4	Credit
OP 1.5	Politology	4	Credit
OP 1.6	Safety of work and life	4	Credit
<b>Optional Part 2 (according to students choice)</b>			
OP 2.1	Second Foreign Language (Polish)	4	Credit, Exam
OP 2.2	Management Fundamentals	4	Credit
OP 2.3	Logics	4	Credit
OP 2.4	Religious studies	4	Credit
<b>Range of components for the general training cycle</b>		<b>54</b>	
<b>2. CYCLE FOR SPECIFIC PURPOSES (PROFESSIONAL) TRAINING</b>			
<b>Compulsory Components</b>			
CC 1	General Psychology	4,0	Exam
CC 2	History of Psychology	4,0	Exam
CC 3	Psychology of Age	6,0	Exam
CC 4	Pedagogical Psychology	6,0	Exam
CC 5	Social Psychology	6,0	Exam
CC 6	Psychology of Pathology	5,0	Exam
CC 7	General Psychology Workshop	6,0	Exam
CC 8	Psychodiagnostics	4,0	Exam
CC 9	Mathematical Methods in Psychology	4,0	Exam
CC 10	Experimental Psychology and Scientific Psychological Research Fundamentals	8,0	Exam
CC 11	Psychological Correction	4,0	Exam
CC 12	Psychology of Communication	4,0	Exam
CC 13	Psychology of Personality	5,0	Exam
CC 14	Clinical Psychology	4,0	Exam
CC 15	Psychology of Conflicts	4,0	Exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

CC 16	Gender Psychology	4,0	Exam
CC 17	Ethics and Psychology of Family Life	4,0	Exam
CC 18	Psychology of Giftedness and Creativity	4,0	Exam
CC 19	Psychological Consulting Fundamentals	5,0	Exam
CC 20	Social Psychology Training	4,0	Exam
CC 21	Psychological Service in Educational System	4,0	Exam
CC 22	Psychological Assistance in Crisis and Extreme Situations	5,0	Exam
CC 23	Psychology of Management	4,0	Exam
CC 24	Fundamentals of Psychotherapy	5,0	Exam
CC 25	Methodology of Psychological Expertise Procedure in Different Fields.	4,0	Exam
CC 26	Physical Upbrining	8,0	Credit
<b>Optional components</b>			
<b>Optional part 1 (according to university choice)</b>			
OP 1.7	Sociology	4	Exam
OP 1.8	Mediawareness	5	Exam
OP 1.9	Anatomy and Evolution of Nervouse System	4	Exam
OP 1.10	Ukraine in the Context of European History	4	Exam
OP 1.11	Methodological and Theoretical Psychology Problems	4	Exam
OP 1.12	Methodology of Psychology Teaching	4	Exam
OP 1.13	Philosophy of Psychology	4	Exam
OP 1.14	Psychology of Politics	4	Exam
OP 1.15	Engineering Psychology	4	Exam
OP 1.16	Psychology of Inclusive Education	4	Exam
<b>Optional part 2 (according to students choice)</b>			
OP 2.5	Anthropology	4	Exam
OP 2.6	Psychophysiology	4	Exam
OP 2.7	Comparative Psychology	4	Exam
OP 2.8	Ecological Psychology	4	Exam
OP 2.9	Psychologist's Work Management	4	Exam
OP 2.10	Basics of Entrepreneur Activity	4	Exam
OP 2.11	Basics of Demography	4	Exam
OP 2.12	Psychology of Volunteering Activity	4	Exam
<b>Range of Components of Specific Purposes (professional) training</b>		<b>198</b>	
<b>3. Other Types of Training</b>			
CC 1	Military Training		
CC 2	Culture and Education Training		
CC 3	Educative (Professional) Practice	2,0	
CC 4	Educative (Diagnostics and Correction) Practice	3,0	
CC 5	Educative (Rehabilitation) Practice	2,0	
CC 6	Job Placed (Consultative) Practice	5,0	
CC 7	Job Placed (Ab Initio Diploma) Practice	4,0	
CC 8	Державна атестація	1,0	
<b>GENERAL RANGE of SPT</b>		<b>272</b>	

## Annotations component of the curriculum

### 1. General Training Cycle

#### Compulsory Components

**Ukrainian for Professional Studies and Documentation.** Lexical, spelling, morphological, syntactic norms of modern Ukrainian literary language. Voice over speech and its features. Speech composition. Lexical and grammatical means of the relevant reproduction of communicative intentions in writing. Requirements for professional texts: objectivity of presentation, logic, consistency, completeness of information, accuracy, conciseness, standard.

**History of Ukrainian Statehood.** The study of discipline involves a deep understanding of the history of the emergence and formation of the Ukrainian people and Ukrainian statehood by students, the establishment of a national identity, the coverage of the political activity of classes and social groups in Ukraine at certain stages of historical development. The general mission of the course – to maintain the processes of humanization of higher education, the integration of professional, social and humanitarian training; to improve the content of the course structure, using the achievements of world and national philosophy, universal values and train highly skilled specialists in the agro-industrial complex.

**Philosophy.** The course teaches a system of knowledge of such sections of philosophy as ontology, epistemology (theory of knowledge), social philosophy, historical types of philosophy, revealing the essence of the relation "man - the world" in its most basic manifestations. The phenomenon of religion, its origin, the main religious studies concepts, the history and the present situation of the tribal, early and late national religions, the main provisions of the doctrine and cult of the most influential religions in the world.

**Ethics and aesthetics.** Morality as a social phenomenon, as a phenomenon of culture and as a form of worldview, covers the moral issues of human consciousness, activity and communication. The internal, existential aspects of morality, the question of good and evil, responsibility, meaning of life, happiness, justice, and love are revealed. The author analyzes a number of actual ethical issues, in particular the relation between morality and law, morality and politics, national and universal moral values. The initial categories of aesthetics, the specifics of the structure of aesthetic activity and the peculiarities of aesthetic consciousness are analyzed. Art is analyzed in a comprehensive way as a social phenomenon, its morphology, patterns of development and historical typology, the essence, peculiarities of the aesthetic culture of the individual and the system of aesthetic education are revealed.

**Foreign language for professional purposes.** Phonetic rules of a foreign language. Audition and Speaking. Lexical minimum (categories of being, their properties and relations, geographical, demographic, economic and political data) of a specific country of the world, the language of which is being studied. The lexical minimum of regional and social differences between Ukraine and the country of study. Reading for a grasp and reading for the gist at a specified time without a dictionary. Studying reading with a certain number of unknown words (using the dictionary). Abbreviations of foreign-language professional terms in a specific professionally-oriented field. Structure of dialogue of general scientific character. Features of the dialogue of professionally-oriented character. Lexical minimum on business contacts, business meetings, meetings. Elements of foreign language information interpreting in the process of business interaction.

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**Ethnocultural studies.** Culture, methodology for the study of cultural phenomena. typology of cultures, comparative analysis of cultures, evolution of culture, development of Ukrainian culture. Traditional Ukrainian culture of family communication, housing, home management.

**Law Culture of Personality.** Formation of legal thinking and cultural style of lawful conduct in everyday life both in interpersonal relations and in communication with representatives of judicial and law enforcement agencies.

**Fundamentals of Human Biology and Genetics.** The laws of life development, structure and vital functions of the human body at all levels of organization of living, impact of the environment on human factors. Human biology, its constituent parts. The human body as a holistic biological system. An Intelligent Man - a biological species. The origin of man. Fundamentals of human genetics. Subject and tasks of studying human genetics. Methods of studying human genetics and their resolution. Modern genetics on mechanisms of human heredity and viability.

**Latin.** Formation of knowledge on the basics of the Latin language, the formation of skills and skills for the translation of Latin texts and the use of Latin language in educational, scientific and productive activities.

**Pedagogy.** The questions of the theory and practice of teaching organization (didactics), education and management of education (school science) are considered.

**Zoopsychology.** Physical activity of animals. Development of animals psyche in ontogenesis. Development of psyche and behavior in the postnatal, juvenile periods and during puberty. Instinctive behavior as the basis of animal life. Instinct and learning. Elementary mental activity of animals. Problem of thinking, intelligence and consciousness for animals. Animal communication systems. Problems of sociobiology. The nature of altruism, selfishness and aggressiveness. Mechanisms of congenital prohibition in animals.

**Anatomy and physiology of the nervous system.** History of physiology of higher nervous activity as a science. Basic methods and concepts of physiology of GNI. Anatomical physiological aspects of higher nervous (mental) activity. Concept II signaling system. Cork-subcortical relations in the processes of higher nervous activity. Physiological analysis of the "unconscious" in the human psyche. Physiological bases and forms of behavior. Regularities of conditioned reflex activity. Psychophysiology of thinking, emotions and memory. Physiology of human sensory systems. Physiological bases of labor activity.

**Psychology of Religion.** The purpose of the course studying is to provide students with knowledge about the specifics of the religion phenomenon in psychological study and aspects of religiosity psychological analysis, as the essential state of world perception of a man; to form the ability of the analysis of socio-psychological religion study results.

**Psychology of Sport.** Structure of professional activity of a psychologist in sport. Areas of activity of a sports psychologist. Psychological characteristics of an athlete's personality. Formation of an athlete's personality. Psychology of the sports team. The psychological climate of the sports team. Group interaction in a sports team. Understanding the psychological climate in sports activities. Psychological principles of psychomotor skill. Psychological training in sport. The psychological essence of technical training in sport. Psychological principles of tactical preparation in sport.

**Psychology of Law.** General psychological and socio-psychological basics in legal psychology. Psychology of law-making activity. Contents of professionograms of an investigator, a judge, a lawyer, a notary. Psychological Aspects of Legal Responsibility. Professional deformation. Criminal psychology. Psychological analysis of the offender's personality. Psychology of criminal behavior. The psychological structure of the crime. Deviant behavior and its peculiarities. Social degradation. Motive as an element of the

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psychological mechanism of a criminal act. The psychological consequences of a crime. Psychology of investigative actions. Penitentiary Psychology. Social groups of convicts and their psychological characteristics. Psychological foundations of re-socialization of convicts.

**Non-governmental sector and volunteering.** The discipline deepens the notion of non-governmental (non-profit) organizations (NGOs). The goal is to provide knowledge about the specifics of NGOs solving social work tasks; their kinds, types, features of management, indicators of viability, peculiarities of work with volunteers. Concept, structure, importance of non-governmental organizations in solving social problems. Legal support of the activities of non-governmental organizations that carry out various types of social work. Interaction and cooperation of non-governmental organizations with mass media and business in social work. The specifics of the interaction of a non-governmental organization with the government and state structures. Volunteer Service of the Non-Governmental Organization of the Social Sphere. Experience of social work of non-governmental organizations.

**Social Tutorship.** The role of the social tutorship in society, the social significance of tutors activity in the context of inclusive education introduction. The content of the main technologies developed by modern socio-pedagogical and psychological sciences and the practice of working with disabled children. Methods of work of the social guardian with children at various life restrictions.

### Optional components

#### *Optional part 1 (according to the university course)*

**Economy.** In the theoretical aspect - assimilation of the basic principles and laws of economic life of the country, in the applied one - the acquisition of basic provisions on the methods of analysis and calculation of microeconomic and macroeconomic indicators.

**Modern Information Technologies.** The purpose is the formation of knowledge on the essence of new information technologies, as a social product, which provides intensification of all spheres of the economy, acceleration of scientific and technological progress, the development of science, the democratization of society. In the process of this academic discipline studying, students acquire the knowledge, skills and abilities of using modern information technologies in the professional activities of a psychologist.

**Ukrainian Studies.** A holistic, scientifically-integrated system of knowledge about Ukraine and world Ukrainianness in the entirety of their temporal-spatial existence, development and perspectives; the science of historical memory, the education, culture, experience, ethics, morals and love. Aim: to form social and life competencies of students based on knowledge about Ukraine and world Ukrainians; acquaintance with the material and spiritual values of the Ukrainian people; studying the peculiarities of the Ukrainian environment, ethnos, language, culture, nation-state formation, Ukrainian mentality, historical development and historical destiny of the Ukrainian people; the formation of a spiritually rich person with integral representations of the world, deep patriotic feelings and developed national self-consciousness.

**Ecology.** Place of discipline in the system of natural sciences; history of ecological science. The sections of the academic discipline are presented in the hierarchical sequence: aeocology (ecology of the organism), demecology (ecology of the population), biocenology (synecology), biogeocenology (ecosystemology) and biospherology (global ecology). Applied ecology problems - natural, social and technological.

**Politology.** The phenomenon of political power, the laws of its functioning and development, its use in society. The main directions, forms and methods of democratization of the political system. Ways to build a rule of law. Value of universal and public interests in international relations. Conditions and ways of combining social and political forces.

**Safety of Work and Life.** Scientific fundamentals of Safety of Life. Physiological and psychological criteria for human safety. Fundamentals of valeology. Emergency help in case of accidents. Dangerous environmental factors. The environment of human life. Negative electrical and electromagnetic factors.

### ***Optional part 2 (according to the student's choice)***

**Second foreign language (Polish).** Formation of knowledge on the basis of phonetics, vocabulary, grammar and stylistics of the Polish language, formation of skills and abilities in translation of Polish authentic texts. Orthographic, morphological, lexical, stylistic, syntactic and punctuation norms of contemporary Polish literary language; genres of official and informal communication and their main communicative features; the culture of dialogue and political speech; principles of stylistic analysis and correction of the text in accordance with the norms of modern Polish literary language.

**Fundamentals of Management.** System of knowledge about the essence of management in enterprises and organizations of agrarian and industrial complex and skills in management production processes; conditions for ensuring the effectiveness of economic structures; diagnostics and designing of agrarian management systems that are adequate to the goals and objectives of market economy in agriculture.

**Logics.** The method of logic, the basic forms and laws of thinking, the roots of modern logics emergence, the division of classical logics, typology and analysis of formal logical theories within the logic of utterances and the logics of predicates.

**Religion Studies.** Religion Studies as a science and a discipline. Theological-philosophical, psychological and sociological approaches to the study of religion. Psychological concepts of religion. Sociological concepts of Religion. Elements and structure of religion. The role and functions of religion in society. Primitive forms of religion. General characteristics of primitive forms of religion. Early-historical forms of religion and tribal cults: fetishism, totemism, taboos, magic, animism. Shamanism. Ethnic religions. Characteristic features of ethnic religions. Types of ethnic religions. Elements and structure of religion. Functions and the role of religion in society.

## **2. SPECIAL (PROFESSIONAL) TRAINING CYCLE**

### **Compulsory components**

**General Psychology.** Subject, principles, tasks, significance of psychology, its methods. Patterns of mental processes: sensations, perceptions, attention, imagination, memory, speech, thinking, freedom, emotions and feelings. Features of mental states of man. Personality and its individual psychological peculiarities.

**History of psychology.** The main stages of the development of psychological knowledge. The development of psychological ideas within the philosophy and the natural sciences. The formation of psychology as an independent science and the development of its branches. The main tendencies and concepts of scientific psychological thought from the end of the nineteenth century to the present day.

**Age psychology.** Subject, history of development and methods of age psychology. Conditions, driving forces and basic laws of mental development in ontogenesis. The problem of periodization of age development in the works of foreign and domestic psychologists. Features of mental and personal development in infancy, early childhood and preschool age, in younger school, teenage, youthful age, adolescence and old age.

**Pedagogical psychology.** Psychology of educational activity. Psychology of personality upbringing. Psychological characteristic of pedagogical activity. Educational-pedagogical cooperation and communication in the educational process. Interaction of the subjects of the educational process. Difficult communication of subjects of the educational process in pedagogical interaction. Specificity of the psychological culture of the teacher.

**Social Psychology.** Subject and methods of research in social psychology. Patterns of communication and interaction of people. Socio-psychological aspects of interpersonal relations of personality. Psychology of small and large social groups. The development of personality in the system of interpersonal relationships. Psychological patterns of social group management. Applied research in social psychology.

**Pathopsychology.** Subject and objectives of pathopsychology, history of development of views on mental pathology, history of development of pathopsychology. Types of mental disorders: disorders of mental processes, consciousness, personality. Deviant personality behavior. Violations of mental development at different stages of ontogenesis.

**Workshop on general psychology.** Methods of study of cognitive mental processes. Methods of study of higher cognitive processes and processes of goal-setting. Methods of research of emotional-volitional processes and mental states. Methods of studying the personality and its individual psychological peculiarities.

**Psychodiagnostics.** Concept of psychodiagnostics, its subject, structure. History of psychodiagnostics. Classification of psychodiagnostic techniques. Test as the main tool of psychodiagnostics. Psychometric requirements for the construction and verification of techniques. Basic stages of designing the test. Personnel questionnaires. Projective methods of personality diagnostics.

**Mathematical methods in Psychology.** This course covers the structure of probability theory, which is the foundation of statistics, and provides many examples of the use of probabilistic reasoning. It discusses the most commonly encountered probability distributions, both discrete and continuous. The course considers random sampling from a population, and the distributions of some sample statistics. It deals with the problem of estimation - the process of using data (in the best possible way) to learn about the value of the unknown parameters of a model. Finally, it discusses hypothesis testing - the use of data to confirm or reject hypotheses formed about the relationship among (economic) variables.

**Experimental psychology and the fundamentals of scientific research.** This is an undergraduate psychology course designed to provide students with knowledge about and hands-on practice with experimental research methods in psychology. Students will learn how to plan, conduct, and analyze their own experimental research, and how to communicate the results of their research to others. Students will develop the knowledge and skills to apply and critique the scientific method in future courses.

**Psychological correction.** Psychocorrection as a direction of activity of a psychologist. The concept of psycho correction. Types of psychocorrections, principles, goals and objectives of this work, the main models of psycho-correction practice; methods and techniques of psychocorrection, ways of correction of cognitive psychical processes, emotional disorders and violations of the communicative sphere; features of work with different age groups. Features of constructing psycho-correction programs.

**Psychology of communication.** Familiarization of students with basic approaches to communication analysis; providing understanding of nature, patterns and mechanisms of this process, forming skills of possession of communication techniques; readiness to apply the technology of effective communication in different situations of practical activity, ability to apply methods of self-regulation in the process of communication.

**Psychology of personality.** Psychology of personality as a branch of psychological science. Personality and its main manifestations. Structure and factors of personality development. Classification and basic properties of theories of personality. Psychodynamic theory of personality. Neo-Freudian, humanistic, dispositional and phenomenological trends in the psychology of personality. Approaches theories of teaching to the study of personality. Cognitive and socio-cognitive theory of personality. Gestalt psychology and its peculiarities of personality study. Modern trends in personality psychology.

**Clinical Psychology.** Clinical psychology as a science. History of formation and development of clinical psychology. The subject of clinical psychology. Relationship of clinical psychology with other sciences. Tasks and principles of psychological research in the clinic. Methods of Clinical Psychology. The concept of health. Health Criteria. The concept of the disease. Classification and etymology of pathopsychological disorders. Pathopsychology as a section of clinical psychology. Psychology of the patient. Psychology of the diagnostic process. Psychology of the therapeutic process. Psychology of the medical worker and the medical profession. Psychological features of the diagnostic process. Psychology of the therapeutic process. Psychological requirements for the physician's personality. The main models of building a relationship "doctor-patient". Psychological features of the use of drugs. Ethical principles of the clinical psychologist. General principles of the organization of medical and psychological assistance. The work of a clinical psychologist in various types of medical institutions. Psychological features of patients with various somatic diseases. Basics of psychosomatics.

**Psychology of the conflict.** Subject and object of conflictology. Characteristics of the conflict as a social phenomenon. Patterns of conflict interaction. Structural and dynamic characteristics of the conflict. Classification of conflicts. Psychological characteristics of intrapersonal and interpersonal conflicts. Prevention (prevention) of conflict interaction. Ways and ways to resolve conflicts.

**Gender Psychology.** Gender research as an interdisciplinary research and educational practice. Concept of psychological gender and gender identity. Categories of masculinity and femininity as meaningful components of gender identity. The main stages of the formation of gender identity. The concept of gender stereotypes, their typology and content. The theory of social design of gender. The concept of gender and gender. Reasons for matching gender expectations. Differential socialization as a monotonous phenomenon. The process of forming the psychological sex of a person, his mechanisms. Differences in the intrapersonal dynamics of the formation of sexual identity for boys and girls. The concept of "gender" and "sexual socialization". Differentiated pedagogical influence on the formation of gender behavior of the individual.

**Ethics and Family Life Psychology.** Adopting a Family Relationship framework; Family Development: Continuity and Change; Gender, Culture, and Ethnicity Factors in Family Functioning; Interlocking Systems: the individual the family and the community; The Development and Practice of Family Therapy Growth of Family Therapy; Professional issues and Ethical Practices; Human Validation Process Model; Emotionally Focused Therapy; Symbolic-Experiential; Psychodynamic Approaches; Objects Relations Transgenerational Approach; Genogram and other topic presentations and all papers due Structural Family Therapy; Strategic Family Therapy; Behavioral/Cognitive; Solution-Focused Brief Therapy; Narrative Therapy.



**Psychology of creativity and giftedness.** Psychological foundations of creativity. Basic psychological theories of creativity, giftedness and genius. The nature and peculiarities of the course of the creative process. Creativity, intuition and insight. Psychology of creative personality. Giftedness, talent, genius. Methods of psychodiagnostics and development of creative abilities. Models of psychological support and learning gifted children. Training programs for the development of creative abilities of the individual.

**Basics of psychological counseling.** Organization of advisory interaction. The concept of advisory contact. Technology of consulting interviews and conversations. Basic procedures for psychological counseling. Family and marriage counseling. Psychological counseling in education. Providing advisory assistance. Group counseling.

**Socio-psychological training.** Specificity and theoretical foundations of socio-psychological training as a dynamic form of education. Historical and methodological foundations of training work. Training sessions as a learning process. Types and training classifications. Technologies of carrying out of social-psychological training. Organizational and methodical aspects of preparation of social-psychological training. Structure and main provisions of the training session. Methodical characteristics of the training session. Methods of assessing the effectiveness of a training session. Professional and personal qualities of the trainer. Methodological principles of preparation and conducting of effective training training. Methodology of group interaction organization. Methodology for developing a plan for conducting socio-psychological training. Techniques, exercises and game techniques used in training.

**Psychological service in the education system.** General characteristics and concept of psychological service. Theoretical and methodological principles of the psychological service of education. Regulatory basis of the psychological service in the field of education. Moral norms regulating the activities of a practical psychologist in situations of ethical choice. Types of activities of the psychological service staff: diagnosis, prevention, psychological examination, psychological prognosis, counseling-psychological correction, psychological education, socio-psychological rehabilitation. Features of the work of psychologists and tasks of psychological service in different parts of the education system and different types of educational institutions. Psychological help for children of preschool age. Work of a psychologist with junior schoolchildren. Diagnosis of child's readiness for schooling. Psychological-pedagogical diagnostics of pupils' development of 2-4 classes. General characteristics of correction and development work. Work of a psychologist with pupils of grades 5-11. Basic forms and methods of psychologist's work. teenagers and senior pupils. General characteristics of the psychological service of institutions of higher education. Features of the work of a psychologist with parents and pedagogical teams.

**Psychological aid in crisis and emergency situations.** 1. Disability issues; 2. Suicide (Select a specific age cohort such as adolescent, college aged, mid-life, elderly); 3. Enactment of the Advanced Declaration (Living Will); 4. Post-trauma symptomatology; 5. Current treatment of PTSD; 6. Multicultural concerns in crisis intervention; 7. The role of spirituality/religion in adaptation to trauma; 8. Bereavement – normal vs. complicated; 9. Caregiver fatigue; 10. Trends in victimology; 11. Survivor/victim issues associated with one of the following categories: homicide, domestic battery, relationship violence including stalking, sexual assault as adult or child, hate crimes; 12. Emergency medical and public safety intervention models; 13. DSM-IVTR diagnosis categories and related issues; 14. Disaster response (agencies and models); 15. Assessment of trauma history and impact of events; 16. Intervention and treatment outcome studies; 17. Impact of trauma on early childhood; 18. Public/private school intervention models; 19. Role and efficacy of community/national hot line services; 20. Certification of crisis/trauma intervention

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specialists; 21. The neuropsychological response to trauma/current trends in research; 22. Post-trauma growth.

**Psychology of management.** Psychology of management as a branch of psychological science. Structure and functions of management activity. Levels of psychological and managerial problems (psychological aspects of the activities of the head, the organization as the subject and object of management, the interaction of the head with members of the organization). Socio-psychological theories of management. Psychology of the personality of the head. The content of the concepts "leader" and "leader" in the management of the organization. Managerial role of manager. The level of formation of the psychological readiness of the future specialist to management. Striving for leadership and leadership ability. Approaches to leadership learning. Forms of power and influence. Typology of management styles. Levels of organization management decisions. The main styles of implementation of the process of making managerial decisions. The concept of motivation and its role in management. Theories of labor motivation. Psychology of collective management. Psychological characteristics of the group as a structural element of the organization. Phenomena of group life. Psychology of business communication. Manipulative technologies in management. Psychology of conflict management. Gender aspects of professional activity.

**Basics of psychotherapy.** Psychotherapy at the present stage, the place of psychotherapy in the system of psychological knowledge. Types and forms of psychotherapeutic work of a psychologist. Purpose, task and principles of psychotherapy. Professional training of psychotherapist, competence and qualification questions. The model of psychology and client interactions within different psychotherapeutic schools. Requirements for the personality of the therapist within different therapeutic areas and schools. Professional deformation of the personality of the psychologist. Professional ethics and responsibility of the therapist. Clinical and physiological bases of psychotherapy. Psychological principles of psychotherapy. Medical model of psychotherapy, interaction in the system "patient-patient". Psychological model of psychotherapy, interaction in the system "psychologist-client". The main stages of the psychotherapeutic process. Problems studying the client's personality. The problem of the limits of psychotherapeutic influence. Criteria for the effectiveness of psychological care. Preparatory stage of therapeutic work, stage of adjustment for interaction, first meeting with the client, diagnostic stage, therapeutic stage, stage of control. The procedure of client psychological support. The concept of psychotherapeutic intervention. Therapeutic possibilities of psychoanalysis. Psychological counseling and therapy: existential and humanistic model. Cognitive-behavioral approach in psychotherapy, problems of world outlook. Principles of constructing eclectic psychotherapy: systemic eclecticism.

**Methodology of conducting psychological examination in various branches of psychology.** The purpose is to get acquainted with the main issues of psychological examination, the technology of its conduct and preparation; the formation of the ability to independently plan and conduct psychological examination, to choose the appropriate methods for studying the personality traits, to identify and study personal qualities, individual psychological and psycho-physiological features of the personality.

**Physical Education.** The purpose - the formation of the physical culture of a young specialist and the ability to implement it in the social-professional training and family. The task of studying the discipline is to strengthen the health of students and the development of physical abilities that correspond to the professional activity of a future specialist.

**Optional components*****Optional part 1 (according to university choice)***

**Sociology.** Subject and definition of Sociology. History of Sociology. Sociological comprehension, sociological explanation. Sociological theories in rivalry. Central concepts of Sociology. Society. Social action Social fact. Classification of Sociology. Structure of sociological knowledge. Functions of sociology and its role in the development of society.

**Media Literacy.** A set of knowledge, skills and abilities that allow people to analyze, critically evaluate and create messages of various genres and forms for different types of media, as well as understand and analyze the complex processes of media functioning in society and their impact.

**Anatomy and evolution of the nervous system.** Subject and tasks of the anatomy of the nervous system The laws of growth and development of the human body. General characteristics of the nervous system. The value of the central nervous system. Concepts about nerve centers and their properties. Spinal cord. Brain. The trunk of the brain. Longitudinal and posterior brain. Medium and intermediate brain. Ultimate brain Vegetative nervous system: sympathetic and parasympathetic, its evolution Peripheral nervous system. General concept of physiology of higher nervous activity.

**Ukraine in the context of European History.** The phenomenon of Ukrainianness, laws, experience and lessons of its ethno-national, State-building, material and spiritual life. Ukraine in terms of partnership building.

**Methodological and theoretical problems of psychology.** The goal is to form students' ideas about the theoretical foundations (explanatory principles, the subject of science) and the methodological basis of psychology; development of the ability to build a research methodology. The tasks of studying the discipline are: awareness of the prospects of the development of psychology as a scientific knowledge; understanding of the main methodological problems of psychology; study of the principles of psychological science, explaining the laws of the existence of the subject of psychology; understanding of the basic and metascientific categories of science.

**Methodology of teaching psychology.** Goals, content, principles of teaching psychology; methods, receptions and forms of training; Planning of the educational process in psychology.

**Philosophy of Psychology.** The philosophical and methodological content of classical and newest actual problems of psychological science. From the standpoint of unity and interaction of philosophy and psychology, the socio-psychological phenomena are covered. Knowledge of philosophical methodology will improve the activities of the psychologist, help him to build and regulate the relationship with people, deep understanding of the motives and their actions, to know the objective reality, to correctly evaluate it and use the results obtained in practice.

**Political psychology.** Psychological characteristics of the subjects of politics. Psychology of political culture. Political culture concepts, its levels and types. Political psychology of personality. The problem of political activity of the individual. Political socialization. Psychology of political power and power relations. Political elite and counterelite in modern society. Political leadership as a psychological phenomenon. Psychology of the groups in politics. Elemental mass political behavior and mass political consciousness. Political stability and political conflict. Psychology of political violence.

**Engineering Psychology.** Information interaction between a person and a machine. The operator's activity in the system "man - machine". Mental phenomena and their characteristics in the operator's activities. Operation in special conditions. The perception of information by the operator. Psychophysiological peculiarities of the receiving information process. Saving and processing information by the operator.

Psychological aspects of the problem of decision making. General characteristic of the functional states of the operator. Emotional states of the operator. Fatigue of the operator. Control of the functional state of the operator. Taking into account the operator's limiting possibilities and questions of his psychological support.

**Psychology of inclusive education.** The purpose is to get acquainted with the methods of psychological support of children with special needs in the adaptation period of their entry into the educational space. The important directions and methods of work of psychologist on formation of educators' and tutors tolerance in treating children with special needs are considered. Formation of comprehension of individual peculiarities in development and educational needs of children, ways of establishing a productive interaction of children with special needs with a group of peers (in the preschool group, school class, student group).

### ***Optional part 2 (according to students' choice)***

**Anthropology.** Properties of people as members of the same species and their ways of adapting to different environments. Branches of anthropology. Physical anthropology. Linguistic anthropology. Anthropology of cultures. Social Anthropology. Applied anthropology. History of Anthropological Thought. Modern anthropology.

**Psychophysiology.** The problem of the correlation of the brain and the psyche. Consciousness as a psychophysiological phenomenon. Psychophysiology of the cognitive sphere. Psychophysiology of sensations and perception. Psychophysiology of attention. Psychophysiology of memory. Psychophysiology of thinking (intelligence). Psychophysiology of functional states and emotions. Physiological bases of needs, motivation. Psychophysiology of adaptation and stress. Psychophysiology of addictive behavior. Changes in the physiological bases of the psyche in ontogenesis. Diagnosis and correction of functional states.

**Comparative psychology.** The problem of the emergence and evolution of the psyche. Methods of studying the psyche of a man and animals. Behavior of animals in a comparative aspect with a person. Elementary sensory psyche. Perceptual psyche. Development of human and animal psychic activity in the game period. The problem of thinking, intelligence and consciousness of animals. Animal communication. The language of the animal and the language of the person. Knowledge and its role in the development of the psyche. Individual memory and learning. The basics of bioethics and human behavior. Genetic memory. Levels of phylogenetic memory. The basics of bioethics and human behavior. The theory of genetic-cultural co-evolution.

**Ecological psychology.** Subject, tasks and problems of ecological psychology. Concept of the environment and socioecological systems in ecological psychology. Environmental factors and their interaction with the human factor. Problems of ecological consciousness. Ecopsychological education and upbringing. Radioecology Psychology.

**Management of the psychologist's work.** Functions of management of the psychologist's work, principles and regularities. Labor resources, motivational theories of labor activity. Management of project activity. Management styles in the situation, conflict resolution methods. Organization and co-ordination of the work of a psychologist with different categories of clients.

**Basics of entrepreneurial activity.** The essence of entrepreneurship and business environment. Characteristics of entrepreneurship. Entrepreneurial environment. The main factors of the macro business environment. Economic, social and legal conditions necessary for the conduct of entrepreneurial activity. Types and forms of entrepreneurship.

**The basics of demography.** Sources for studying the reproduction of the population. Methodological approaches and methods of analysis of demographic processes and structures. Quantitative analysis and measurement of demographic processes and structures. Reproduction of population as a unity of demographic processes. Reproduction of the population and its historical types. Fertility and reproductive behavior. Mortality and longevity. Population migration.

**Psychology of volunteer activity.** Psychological structure of volunteer activity, components and factors of volunteer activity efficiency. Volunteer activity as the basis of self-realization of personality. Influence of the new socio-cultural environment, development of cognitive and foreign language communicative competences through volunteer activities. The discipline deepens the notion of non-governmental (non-profit) organizations (NGOs). Concept, structure, importance of non-governmental organizations in solving social problems. Legal support of the activities of non-governmental organizations that carry out various types of social work. Interaction and cooperation of non-governmental organizations with mass media and business in social work. The specifics of the interaction of a non-governmental organization with the government and state structures. Volunteer Service of the Non-Governmental Organization of the Social Sphere. Experience of social work of non-governmental organizations.

## **2.17. EDUCATIONAL AND RESEARCH INSTITUTE OF CONTINUING EDUCATION**

**Director** – PhD in Economics, Professor **Maria M. Kulayets**

Tel.: (044) 259-79-11 E-mail: pdv1204@ukr.net

Location: Building №10, Room 219

The ERI organizes and coordinates the educational process of bachelors in the following specialties:

### ***241 Hotel and Restaurant Business***

Educational-professional Program «**Hotel and Restaurant Business**»

Graduating Department:

Extension and Tourism Department Tel.: (044) 527-80-61

E-mail: ikudinova@ukr.net

Head of Department – PhD of Economics, Associate Professor I. Kudinova

### ***242 Tourism***

Educational-professional Program «**Tourism**»

Graduating Department:

Extension and Tourism Department Tel.: (044) 527-80-61

E-mail: ikudinova@ukr.net

Head of Department – PhD of Economics, Associate Professor I. Kudinova

**Bachelor**  
**Field of Knowledge" SERVICE SECTOR"**  
**in Specialty "HOTEL AND RESTAURANT BUSINESS "**  
**Educational-professional program «Hotel and Restaurant Business»**

Form of Training:	Licensed number of persons:
– Full-time	XXX
– Part-time	XXX
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian, English
Qualification	Specialist In Hotel And Restaurant Business

### Concept of training

Training of socially mobile, competitive highly skilled specialists for the organization of service and production and technological activities of the hotel and restaurant business entities who possess general and special (professional) competencies.

### Practical training

The program provides a thorough practical training, which is based on the practice based on the leading hotel and restaurant institutions and international practice under international agreements. When passing production practices, perform professional duties of specialists in advertising and leisure, organization of hotel activities, organization of restaurants, specialists in the field of marketing, business efficiency and rationalization of hotel and restaurant business, and others.

### Proposed Topics for Bachelor theses

1. Management of production and service infrastructure of enterprises of hotel and restaurant business.
2. Formation of the system of motivation of labor in the management of hotel business enterprises.
3. Management of the security system at the modern enterprises of hotel and restaurant business
4. PR-technologies in the hotel and restaurant business
5. Management of the quality of products and services in the hotel and restaurant business

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational (Educational-professional or Educational-scientific) programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Specialists are preparing for organizational, managerial, economic, commercial, investment and research activities in the field of hotel and restaurant business. Graduates can work in positions head of divisions / hotel and restaurant manager; specialist in organizing hotel services (administrator, porter, concierge); specialist in restaurant business; specialist in leisure activities.



**Bachelor`s Program and Curriculum in Specialty  
"Hotel and Restaurant Business"  
Educational and professional program "Hotel and Restaurant Business"**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
RC1	Economic Theory: the basics of economic theory:	4	exam
RC 2	Information Systems and Technologies	5	exam
RC 3	History of Ukrainian Culture	4	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
SC 1.1	History of Ukrainian Statehood	3	exam
SC 1.2	Rhetoric and Psychology of Communication	6	exam
SC 1.3	Foreign Language	15	exam
SC 1.4	Work and Life Safety	3	exam
SC 1.5	Physical Education	3	exam
<b>The volume of components of the general training cycle</b>		<b>43</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
RC 4	Geography of Tourism (tourist resources of Ukraine)	4	exam
RC 5	Food Chemistry	5	exam
RC 6	Basics of Tourism Studies	6	exam
RC 7	Organization of Hotel Industry	8	exam coursework
RC 8	Organization of Restaurant industry	7	exam coursework
RC 9	Tourism Geography (tourist country studies))	4	exam
RC10	Restaurant Production Technology	5	exam
RC11	Energy Saving	5	exam
RC12	Technology Services in the Rural Green Tourism's Homes	3	exam
RC 13	Design of HRB Objects	3	exam
RC 14	Mini-technology of Food Production	6	exam
RC 15	The Second Foreign Language	11	exam
RC 16	Sanitation and Hygiene in the HRB Institutions	5	exam
RC 17	Equipment in the HRB Institutions	5	exam
RC 18	Desing of the Restaurant Industry Institutions	5	exam
RC 19	The Economy of HRB Enterprises	5	exam
RC 20	Product Quality Management at HRB Enterprises	5	exam
RC 21	Marketing of HRB Enterprises	5	exam
RC 22	Management of HRB Enterprises	6	exam coursework
RC 23	Analysis of HRB Enterprises	5	exam
RC 24	Business Planning of HRB Enterprises	5	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
SC 1.6	Introduction to the Specialty	3	credit
SC 1.7	Business Law	3	exam
<b>Optional Block 2 (Student's Choice)</b>			
<b>Optional Block</b>			
SC 2.1.1	Ethnic Kitchens	6	exam
SC 2.1.2	Accounting and Auditing of HRB Enterprises	5	exam
SC 2.1.3	Beverage Technology	5	exam
SC 2.1.4	Information Systems and Technologies in HRB	5	exam
SC 2.1.5	Catering	5	exam
SC 2.1.6	Marketing Communications in HRB	5	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

SC 2.1.7	Servicing	5	exam
SC 2.1.8	Marching	4	exam
SC 2.1.9	International Market of Hotel Services	5	exam
SC 2.1.10	Leisure Activities in HRB	5	exam
SC 2.1.11	Bar Business and Organization of Sommelier Work	5	exam
SC 2.1.12	Recreology and Resort Business	5	exam
<b>The volume of components of the special (professional) training cycle</b>		<b>179</b>	
<b>3. OTHER TYPES OF TRAINING</b>			
RC 25	Educational Practice	6	
RC 26	Internship	8	
RC 25	Preparation of Bachelor Work	3	
RC 26	State Attestation	1	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Economic theory: the basics of economic theory.** The purpose of the study of discipline is to provide future specialists with sound economic knowledge, to form the logic of economic thinking and economic culture, to teach them the basic methods of knowledge and analysis of economic processes, the ability to make informed decisions about the economic problems associated with their future practical activities.

**Information systems and technologies.** The purpose of teaching discipline is to form future specialists of the modern level of informational and computer culture, acquire practical skills in work on modern computer technology and use of modern information technologies for solving various tasks in practical activity in the specialty.

**History of Ukrainian Culture.** The discipline has a complex and interdisciplinary character, logical and methodological connection with the sciences ethnography, archeology, history of Ukraine, philosophy, ethics, linguistics, art studies, religious studies, etc. The purpose of studying the discipline is to familiarize students with the main tendencies and forms of ethno-cultural development of the Ukrainian people from ancient times to the present, to analyze and comprehend the various phenomena and processes of cultural life in Ukraine.

**Optional components**

***Optional Block 1 (University Choice)***

Annotations of disciplines “History of Ukrainian Statehood”, “Ethnocultural”, “Philosophy”, “Ukrainian for Professional Purposes”, “Foreign Language (English) see Section 2.1.

**Rhetoric and psychology of communication.** Discipline involves the development of thinking, language skills, mastering the form of effective convincing communication in non-standard situations of life and professional communication, the formation of skills and skills of oratory, development.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Geography of Tourism (tourist resources of Ukraine).** The discipline involves the formation of knowledge, skills and competences for determining the main tourist regions of the world by types of tourism.

**Nutrition Chemistry.** The aim of the course is to study the composition, nature, structure and transformations of inorganic and organic compounds; obtaining skills in the analysis of chemical elements and their compounds; assimilation of the basic methods of food quality control

**Basics of Tourism Studies.** Study of scientific principles of tourism science, formation of necessary knowledge on organization of tourist trips for specialists in the field of tourism.

**Organization of Hotel Industry.** Formation of understanding of the essence of the hotel economy, as a component of the service sector, the students mastering the theoretical foundations for organizing the functioning of the hotel business in the market.

**Organization of Restaurant Industry.** Formation of knowledge on the rational organization of nutrition services, acquisition of practical skills on the internal content, interaction and coherence of technological operations and processes in restaurants.

**Tourism Geography (tourist country studies)** The purpose of studying the discipline is to familiarize students with the methodology and features of a comprehensive study of the tourist industry of countries and regions of the world, data on the main types of tourist and recreational resources, major tourist centers and regions of the world.

**Restaurant Production Technology.** It is planned to study the classification of products of the restaurant industry, the choice of methods of mechanical and thermal culinary processing of food raw materials and products, the main technological methods of preparation of products, the study of problems of innovative technologies, understanding of the essence of the main categories and methods of technological processes, the development of recipes, and the quality control of restaurant services.

**Energy Saving.** The purpose of studying the discipline is to familiarize students with methods and means of energy saving, planning measures to improve energy efficiency and save energy in enterprises of hotel and restaurant business.

**Technology of Service in Villages of Rural Green Tourism.** Formation of theoretical, professional knowledge and practical skills regarding the conditions and principles of recreational tourism program formation; technologies of tourist services, providing recreational tourism services in agro-villages

**Design of HRB Objects.** The aim of the study is to provide students with scientific and professional knowledge on the main types of architectural and design activities; to familiarize future specialists with the basics of complex creative activity of the designer on the formation of the external and internal architectural environment of restaurants and hotels.

**Mini-technology of Food Production.** Formation of knowledge, acquiring practical skills in organizing modern technological processes of processing raw materials of plant and animal origin in the conditions of mini-productions

**The Second Foreign Language.** Studying the discipline enhances students' communicative competence from another foreign language, namely the use of skills, skills and knowledge of a foreign language in the process of business communication with representatives of other countries on a variety of professional issues related to professional tourism, preparation for participation in international conferences, projects and discussions.

**Sanitation and Hygiene in the HRB Institutions.** The discipline envisages studying the basic problems of sanitation and hygiene in the food industry in general, production facilities, shops and lines, personnel hygiene. Consideration is also given to the properties and application of detergents and disinfectants, the characteristics of apparatus for sanitary treatment.

**Equipment in the HRB Institutions.** It envisages acquisition of theoretical knowledge and practical skills by students in the sphere of equipment of hotel and restaurant facilities with modern equipment, which will help accelerate and improve the quality of the service process, create a comfortable internal environment

**Design of the Restaurant Industry Institutions.** The purpose of discipline is to create a system of knowledge among students on the basics of designing objects of hotel and restaurant economy in accordance with their socio-cultural, utilitarian and aesthetic functions; features of placement of HRB objects; plan of improvement of the territory of institutions; definition of the composition and areas of premises of hotel and restaurant facilities; substantiation of the zoning of the internal space of the building; determination of the choice of the main structural elements of the building; bases of architectural designing of objects of HRB.

**The Economy of HRB Enterprises.** Formation of modern economic thinking, a deep understanding of the complex problems of management in the hotel and restaurant business, as well as acquisition of skills and practical skills of economic activity.

**Product quality management at HTB Enterprises.** Studying the management system of restaurant services enterprises, the basics of quality management in the catering system, customer orientation policy, service quality from the consumer's point of view, programs for standardization of quality service.

**Marketing of HRB Enterprises.** Mastering the latest theoretical knowledge on the management of tourism organizations and acquiring practical skills to build a marketing management system for such organizations that would ensure their effective functioning in a competitive and changing business environment; formation of skills and skills in the application of marketing tools in tourism.

**Management of HRB Enterprises.** Mastering the latest theoretical knowledge on the management of enterprises of hotel and restaurant business and acquiring practical skills and skills for building a marketing management system for such business entities that would ensure their effective functioning in a competitive and changing business environment; the formation of skills and skills in the application of marketing tools in the hotel and restaurant business.

**Analysis of HRB Enterprises.** The purpose of the discipline is to master the theoretical provisions for the analysis and evaluation of the activities of the enterprises of the GDB and the acquisition of practical skills in the use of this knowledge for making managerial decisions on improving the efficiency of their activities.

**Business planning of HRB Enterprises.** Formation of the system of theoretical knowledge and practical skills in business planning as an element of hotel and restaurant business management.

### **Optional components**

#### ***Optional Block 1 (University Choice)***

**Entrodution to the Specialty.** Preparation of students to study at the university in accordance with modern integration processes in international education in the context of the Bologna Declaration, acquaintance of students of the first year with the content of the future profession, with the nature and scope of professional activity, with the peculiarities of practical activity of enterprises of the tourism industry.

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**Business Law.** Formation of the knowledge system in the field of regulation of legal relations related to the organization and protection of business activity; characterize and systematize the main institutes of the mechanism of legal regulation of entrepreneurial activity; To give students deep theoretical knowledge and ability to analyze current legislation and use the acquired knowledge in practice.

### ***Optional Block 2 (Student's Choice)***

**Ethnic Kitchens.** Formation of students theoretical knowledge about technology, methods and features of cooking ethnic cuisine, organizing services for foreign guests of our country and acquiring the practical skills necessary for future production activities.

**Accounting and Auditing of HRB Enterprises.** The main purpose of studying the discipline is the formation of theoretical knowledge and acquiring practical skills in the organization and conduct of accounting and auditing financial reporting, as well as the use of their results as an information base for effective decision making in the tourism industry. The main task of studying the discipline is the thorough general economic, accounting and auditing training of specialists and their acquisition of principles, means, methods and methods of accounting for the enterprises of the GRB, as well as the audit of their financial statements.

**Beverage Technology.** Formation of a system of theoretical knowledge on the technology and characteristics of beverages, which are implemented in restaurants, as well as acquiring practical skills in the preparation of mixed drinks and cocktails, their design and presentation.

**Information Systems and Technologies in HRB.** Formation of the necessary theoretical knowledge and practical skills in the construction of modern information systems, their rational use, as well as in the implementation of modern information technology in practical tourism activities.

**Catering.** Study of the features of providing remote services, including all enterprises and services that provide subordinate catering services to employees of companies and individuals in the premises and on-site service, as well as provide services for various purposes and retail sale of finished culinary products.

**Marketing Communications in HRB.** Study of communication processes in the tourism business, as well as the formation of practical skills in the use of MK as a means of increasing the efficiency of tourism enterprises in the market of services

**Servicing.** Study methods and tools of the service process, organization of the contact area for customer service, ways of forming customer relations, elements of optimization of service activities.

**Marching.** Formation of theoretical knowledge and practical skills of students in the application of merchandising by production / supply and retail enterprises in promoting goods to consumers at the point of sale.

**International Market of Hotel Services.** Formation of knowledge about the functioning of the hotel sphere at the international level the current state of the hotel business in the world, its features and proposals, as well as the specifics of functioning in certain countries of the world, the acquisition of the skills of using the information obtained to further create effective tours with the inclusion of a specific type of accommodation that coincides with the purpose and features of the tour.

**Leisure Activities at the HRB.** Study of the organization of work of the service engaged in the provision of additional services, taking into account the requirements of standards and quality of service: catering services - a bar, restaurant, lobby bar, cocktail bar, tea room - spend free time and relax in the billiard room, hookah or cigar room ; services for lovers of active, healthy recreation - use the services of the sauna, thermal

zone, bath, massage, swimming pool, as well as the gym, children's playground, mini-golf, gym and fitness room, basketball, volleyball, water sports facilities sports, etc.

**Bar Business and Organization of Sommelier Work.** Bar business and organization of sommelier work. Formation of students theoretical and practical knowledge and skills in the organization of work and service in bars, as well as on the scientific basis of storage and use of alcoholic beverages by in-depth study of the basic approaches, principles and methods of work of the bartender and sommelier

**Recreology and Resort Business.** The purpose of studying the discipline is to form students' ideas about the main recreational needs of a person, understanding the specifics and types of recreational activities, knowledge of the organization and development of recreational systems. Getting future specialists of professional knowledge in the field of historical development and the current state of sanatorium and resort business in Ukraine and in the world.

**Bachelor**  
**Field of Knowledge "SERVICE SECTOR"**  
**in Specialty "TOURISM"**  
**Educational-professional program «Tourism»**

Form of Training:	Licensed number of persons:
– Full-time	60
– Part-time	30
Duration of Training	4 years
Credits ECTS	240
Language of Teaching	Ukrainian, English
Qualification	Bachelor of Tourism

**Concept of Training**

Providing training highly qualified specialists in tourism, particularly in the field of green tourism in order to preserve the ecology of the environment, social development of rural areas, better use of human resources in the tourism and recreation sector, enhance their professional and social mobility, forming a creative, socially active, spiritually rich personality according to its interests, needs and demands of society and the state. The program involves the use of advanced interactive computer technology studies at leading universities in Europe, America, attracting foreign professors to give lectures.

**Practical Training**

Professional practice of students is an important part of the educational process for the preparation of qualified specialists in tourism. During the study of natural science and professionally oriented, and practical trainings students are introduced to most developed recreation and tourism regions of Ukraine and abroad. In practical training students perform professional duties of managers, marketers, managers of hotels, instructors, animators, guides and interpreters, analysts and others, including health and spa facilities, tourist and hotel complexes, travel agencies and tours, advertising and information centers, resorts and tourism associations, dining and objects of green tourism.

**Proposed Topics for Bachelor Theses**

1. The development of the tourist market.
2. Planning and organization of the travel company.
3. Innovative development of green tourism in Ukraine.
4. The resource potential of the country for the prospects of green tourism development.
5. Methods and techniques in Public Relations for the tourism enterprises development.
6. Development of green tourism abroad.
7. Using of information technology in the enterprise tourism industry.

**Academic rights of Graduates:** graduates can apply for Master's Degree Specialties and Educational programs specified in Table 1.2 Section 1.3 this Catalog.

### **Employment of Graduates**

Specialists are trained for organizational, administrative, economic, commercial, investment and research activities in the field of tourism. Graduates work in enterprises and organizations in the tourism of various forms of ownership and types of entities including a green tourism as heads of travel companies and facilities, travel agencies, etc., experts and heads of administrative work, logistics, marketing, commercial and international departments, HR managers, owners of green estates and so on.



**Bachelor`s Program and Curriculum  
in Specialty «Tourism»  
Educational-professional program «Tourism»**

Code n/a	Components of the educational-professional program (education disciplines, course projects (paper), practice, qualification work)	Amount of credits ECTS	The final control
1	2	3	4
<b>1. GENERAL TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 1	Economic Theory: Foundations of Economic Theory:	5	exam
CC 2	Information Systems and Technology	7	exam
CC 3	History of Ukrainian Culture	4	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.1	History of Ukrainian Statehood	3	exam
OB 1.2	Ecology	5	exam
OB 1.3	Museology	3	exam
OB 1.4	Foreign language (English)	15	exam
OB 1.5	Labour and life safety	3	exam
OB 1.6	Physical training	3	exam
<b>The volume of components of the general training cycle</b>		<b>32</b>	
<b>2. SPECIAL (PROFESSIONAL) TRAINING CYCLE</b>			
<b>Compulsory components</b>			
CC 4	Tourism Geography. (Module I. Tourist Resources of Ukraine)	4	exam
CC 5	Basics of Tourism Studies	6	exam
CC 6	Organization of the Hotel Economy	8	exam, coursework
CC 7	Organization of Restaurant Economy	7	exam, coursework
CC 8	Geography of Tourism. (Module II. Tourist region studies)	4	exam
CC 9	Statistics in Tourism	6	exam
CC 10	Tourist Regional Studies	5	exam
CC 11	Organization of Animation Activities	5	exam
CC 12	Rhetoric and Psychology of Communication	5	exam
CC 13	Information Systems and Technologies in the Tourism Industry	6	exam
CC 14	The Second Foreign Language	11	exam
CC 15	Touring	8	exam, coursework
CC 16	Economy of a Travel Company	5	exam
CC 17	Organization of Excursion Activities	5	exam
CC 18	Marketing	5	exam
CC 19	Tourism Management	8	exam
CC 20	Legal Regulation of Tourism Activity	5	exam
CC 21	Analysis of Activity of Enterprises of Tourism	5	exam
CC 22	Marketing in Tourism	5	exam
<b>Optional components</b>			
<b>Optional Block 1 (University Choice)</b>			
OB 1.7	Introduction to the Specialty	4	exam
OB 1.8	Active Tourism	4	exam
<b>Optional Block 2 (Student's Choice)</b>			
OB 2.1.1	Business Ethics	5	exam
OB 2.1.2	Organization of transport services	7	exam
OB 2.1.3	Event- Tourism	5	exam
OB 2.1.4	Accounting and Auditing in Tourism	3	exam
OB 2.1.5	Specialized Tourism (Green Tourism)	5	exam
OB 2.1.6	Insurance in Tourism	5	exam
OB 2.1.7	Business Planning in Tourism	5	exam

**CURRICULA AND PROGRAMS OF BACHELOR DEGREE**

OB 2.1.8	Recreology and Resort Affairs	5	exam
OB 2.1.9	Contractual and labor law	5	exam
OB 2.1.10	Standardization and Certification in Tourism	5	exam
OB 2.1.10	Logistics in Tourism	5	exam
OB 2.1.11	International Tourism Business	5	exam
<b>3. OTHER TYPES OF TRAINING</b>			
CC 23	Military Training Course	23	exam
CC 24	Academic Practice	6	
CC 25	Production Practice	8	
<b>Bachelor Thesis writing</b>		<b>3</b>	
<b>State Attestation</b>		<b>1</b>	
<b>THE TOTAL AMOUNT OF EPP</b>		<b>240</b>	

**Annotations of Components in the curriculum**

**1. GENERAL TRAINING CYCLE**

**Compulsory components**

**Economic Theory.** The purpose of discipline is getting future specialists fundamental economic knowledge, forming their logic of economic thinking and economic culture, teaching them basic knowledge and methods of analysis of economic processes, the ability to make informed decisions about economic problems related to their future practitioners.

**Information Systems and Technology.** The purpose of teaching is to form future professionals of contemporary information and computer culture, gaining practical skills in modern computer technology and the use of modern information technology to solve various problems in the practice of the specialty.

**History of Ukrainian Culture.** Academic discipline is complex and interdisciplinary nature, logic and methodology of science communication ethnography, archeology, history of Ukraine, philosophy, ethics, linguistics, art, religion and so on. The purpose of discipline is to familiarize students with the main trends and forms of ethnic and cultural development of the Ukrainian people from ancient times to the present, the analysis and understanding of various phenomena and processes of cultural life of Ukraine.

**Optional components**

***Optional Block 1 (University Choice)***

Annotations of disciplines "History of Ukrainian Statehood", "Philosophy", "Foreign Language (English)", "Physical Training", "Labour and Life Safety", see Section 2.1.

**Ecology.** Generates knowledge of the causes, extent and consequences of a national nature, to find ways of overcoming the current crisis in relations between society and nature, sotsioekolohichnoyi consciousness, a new ethical relationship between man and nature; skills and abilities to develop management principles.

**Museology.** Discipline creates professional theoretical knowledge in museology, practical skills and competence of the museum and exhibition activities.

## 2. SPECIAL (PROFESSIONAL) TRAINING CYCLE

### Compulsory components

**Tourism Geography. (Module I. Tourist Resources of Ukraine).** Discipline involves the formation of knowledge, skills and competencies to identify the main tourist areas of the world by type of tourism.

**Fundamentals of Tourist Knowledge.** The course is to study scientific bases of tourist knowledge, to create the necessary knowledge for organizing tourist trips for specialists in the field of tourism.

**Organization of the Hotel Economy.** Understanding of the essence of the hotel economy, as a component of the service sector, to master students the theoretical foundations for organizing the functioning of the hotel industry in the market.

**Organization of Restaurant Economy.** Develop knowledge on the rational organization of nutrition services, acquisition of practical skills in relation to the internal content, interaction and coherence of technological operations and processes in restaurants Organization of Extension Service. Academic discipline provides knowledge on the organization of the consultation process, licensing and certification consulting activities, creation of consulting agencies.

**Geography of Tourism. (Module II. Tourist region studies).** . The purpose of discipline is to familiarize students with the methods and features comprehensive study of the tourism industry of countries and regions in the world, according to the main types of tourism and recreational resources, the main tourist centers and regions.

**Statistics in Tourism.** The course equips students with knowledge, skills and competencies in the use of statistical techniques to quantify the effects of tourism. The main tasks to be solved in the process of teaching include: the collection, verification and evaluation of statistical information, development of statistical forms; construction materials and grouping of statistical monitoring, identifying relationships between different phenomena and processes, establishing its structure; calculating machines generalizing statistical parameters (absolute, relative, middle) and their economic interpretation.

**Travel Nandigram.** Academic discipline involves the formation of students from mastering theoretical and practical knowledge about the peculiarities of the regions ability to independently assess the state tourism opportunities some areas, the degree of character development and use in the development of the tourism industry.

**Organization of Animation Activities.** Generates the students: a theoretical basis and practical skills of animation tourist services in today's global and national tourism business; understanding of the need to use different national traditions, festivals, customs, rituals and other forms of Ukrainian folk art to improve the organization of leisure travelers; apply various animation service programs to enhance the attractiveness of the national tourism product, building motivation to implement them in various stages of service of domestic and foreign tourists.

**Rhetoric and Psychology of Communication.** The discipline involves the development of thinking, language and skills, mastering effective forms of persuasive communication for unusual situations of life and professional communication, formation and skills of public speaking, developing skills to create and deliver public speeches.

**Information Systems and Technology in the Tourism Industry.** Involves the formation of the necessary theoretical knowledge and practical skills to build modern information systems, their management and the introduction of modern information technologies into practical tourist activities.

**The Second Foreign Language.** Study subjects deepens the students' communicative competence in another foreign language, such as the use of skills, abilities and knowledge of a foreign language in the course of business relations with other

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countries on various professional matters related to professional activities in tourism, preparation for participation in international conferences, projects and discussions.

**Turopereytynh.** Acquiring knowledge and systematic thinking on the organization of the tour operator business, charts its progress and implementation of the formation program of tourist services, documentary ensure the creation, acquisition, implementation planning tours and tour packages, tourist service organization.

**Economy Travel Company.** The task of the course is to provide theoretical knowledge and practical skills in economy travel company and formation of students' capacity for independent creative thinking and solving practical economic problems

**Organization of Excursion Activities.** Provides formation of students' theoretical, professional knowledge and practical skills in planning and organizing excursions, carrying out of excursions.

**Marketing.** To form skills and skills of using marketing tools. The concept and philosophy of marketing. Content and main areas of marketing research and marketing information system.

**Tourism Management.** to form future specialists in modern system economical thinking in the field of management of the organization, taking into account sector specifics and peculiarities of managerial work in the field of tourism industry, training of a highly skilled manager who will be able to provide a high level of efficiency of the management system and competitiveness of the organization in a market economy

**Name of Discipline.**  
(annotation – 1 paragraph)

**Legal Regulation of Tourism Activities.** Generates the students a theoretical basis and practical skills necessary to use modern legal instruments of tourism activities.

**Analysis of Tourism Enterprises Activity.** The purpose of discipline is mastering theoretical positions from the analysis and evaluation of tourism enterprises and domain practical skills to use this knowledge for management decisions to improve enterprise efficiency.

**Marketing in Tourism.** Mastering the latest theoretical knowledge on the management of tourism organizations and acquire practical skills for building management and marketing system such organizations, which would ensure their effective functioning in a competitive and changing environment management; develop skills and abilities in applying marketing tools in tourism.

### Optional components

#### *Optional Block 1 (University Choice)*

**Introduction to the Specialty.** Objective: to prepare students for university studies in accordance with modern integration processes in international education in the context of the Bologna Declaration, to familiarize students of the first year with the content of the future profession, with the nature and scope of professional activity, with the peculiarities of practical activity of enterprises of the tourism sector.

**Active Tourism.** Theoretical and practical bases of traveling on different routes with active methods of travel; acquisition of specific knowledge and skills from various types of active tourism.

#### *Optional Block 2 (Student's Choice)*

**Business Ethics.** Academic discipline aims to provide knowledge about the moral requirements for business relationships of modern technological requirements for the basic forms of business communication - conversations and negotiations, official meetings, etc., on moral principles, norms and rules of etiquette.

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