

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

Department of Statistics and Economic Analysis

APPROVED
Economic faculty
“13” June 2025

**CURRICULUM OF ACADEMIC DISCIPLINE
STATISTICS**

Area of knowledge D "Business, Administration and Law"

Specialty D 1 "Accounting and Taxation"

Academic programme «Analytical, accounting and legal support for
business»

Economic faculty

Developed by: **Voliak L.R.**, Associate Professor of the Department of
Statistics and Economic Analysis, PhD in Economics, Associate Professor

Description of the discipline. Statistics as social science studies the quantitative aspect of mass public phenomenon's in close connection with their qualitative side, investigates the quantitative expression patterns of social development in specific circumstances of time and place.

Studied the subject "Statistics" will allow students of economic specialties to learn the basic techniques and methods of evaluation of mass social-economical phenomena's and processes taking place in the society and in Ukraine in particular, to explore domestic and international experience in the implementation of statistical surveys.

Tasks of the course are study the major categories, concepts, systems, tools and algorithms for statistics; acquirement practical skills solving specific statistical tasks; acquaintance with the scientific principles of fundamental laws of statistical techniques and methodologies; develop abilities of creative search the ways to improve production and business enterprises, socio-economic development with the use of key indicators, techniques and methods of statistics.

Area of knowledge, specialty, academic programme, academic degree		
Academic degree	<i>bachelor's</i>	
Specialty	<i>DI «Accounting and Taxation»</i>	
Academic programme	<i>Analytical, accounting and legal support for business</i>	
Characteristics of the discipline		
Type	Compulsory	
Total number of hours	240	
Number of ECTS credits	8	
Number of modules	4	
Course project (work) (if any)	Course project	
Form of assessment	<i>Credit, Exam</i>	
Indicators of the discipline for full-time and part-time forms of university study		
	University study	
	Full-time	Part-time
Year of study	<u>1-2</u>	
Term	<u>2,3</u>	
Lectures	<i>75 hours</i>	<i>hours</i>
Practical classes and seminars	<i>75 hours</i>	<i>hours</i>
Laboratory classes	<i>- hours</i>	<i>hours</i>
Self-study	<i>90 hours</i>	<i>hours</i>
Number of hours per week for full-time students	<i>6 hours</i>	

1. Aim, competences and expected learning outcomes of the discipline

Aim of the study academic course "Statistics" is the formation in students theoretical knowledge's and practical skills in statistical analysis of mass socio- economic phenomena's and processes as a basis for developing and supporting management decisions that provide knowledge about method of collecting, processing and analysis, identification and assessment patterns development and interaction inherently complex socio-economic phenomena's and processes.

Competences acquired:

Integral competence (IC): the ability to solve complex specialized tasks and practical problems in the field of accounting, auditing, analysis and taxation in the process of professional activity, which involves the application of theories and methods of economic science and is characterized by the complexity and uncertainty of conditions.

General competence (GC):

GC 02. Ability to think abstractly, analyze and synthesize.

GC 11. Skills in using modern information systems and communication technologies.

GC 13. Ability to conduct research at the appropriate level.

Special (professional) competence (SC):

SC 1. The ability to investigate economic development trends using the tools of macroeconomic and microeconomic analysis, to make generalizations regarding the assessment of the manifestation of individual phenomena that are characteristic of modern processes in the economy.

SC 2. Use mathematical tools to study socio-economic processes, solve applied problems in the field of accounting, analysis, control, audit, and taxation.

Expected learning outcomes (ELO):

ELO 02. Understand the place and importance of accounting, analytical, control, tax and statistical systems in providing users with accounting and analytical information in solving problems in the field of social, economic and environmental responsibility of enterprises.

ELO 04. Form and analyze financial, management, tax and statistical reporting of enterprises and correctly interpret the received information for making management decisions.

ELO 15. Possess general scientific and special methods of researching socio-economic phenomena and economic processes at the enterprise.

3. Topics of lectures

№	Topic title	Hours
1	Methodological Principles of Statistics	2
2	Statistical observation	2
3	Compilation and grouping (bunching) of statistical data. Statistical tables	2
4	Analysis of the forms of statistical series distribution and their graphical representation	2
5	Generalizing statistical indicators	4
6	Analysis of variation	3
7	Forms of statistical distribution	2
8	Sampling method	2
9	Statistical methods for measuring correlation	6
10	Time series and their analysis	4
11	Analysis of trends and fluctuations	4
12	Statistical tables and graphs	2
13	Subject and method of agricultural statistics	4
14	Index Analysis	4
15	Crop statistics	4
16	Livestock statistics	4
17	Statistics of production resources and efficiency of agricultural production	4
18	Statistics of agricultural products	4
19	Statistics of market goods and services	4
20	Finance statistics	4
21	Price and inflation statistics	4
22	Statistics of investments and securities	4

4. Topics of practical classes

№	Topic title	Hours
1	Object of Statistics, its main category. Statistical methodology.	2
2	Statistical observation as method of information providing. Program-methodology questions of statistical observation. Organize questions of statistical observation. Forms, kinds and methods of observation.	2
3	Essence of statistical bunching, classification and grouping. Principles of forming groups. Statistical tables.	2
4	Analysis of the forms of statistical series distribution and their graphical representation	2
5	Essence and kind of statistical indexes. Absolute statistical value. Relative values. Average indexes. System of statistical indexes.	4

6	Distribution regularity. Variation characteristic. Characteristic of distribution forms.	3
7	Characteristic of distribution center. Kinds and interconnection of dispersion.	2
8	Sence of sampling method. Sampling values of average and share. Sampling kinds. Statistical verification of hypothesis.	2
9	Kinds of interconnections. Regression analysis. Value of tightness and verification of the essence of correlation connection. Rank correlation. Conformity value of attributive rows variation.	6
10	Essence and compound elements of dynamic row. Characteristics of dynamic intensity. Average absolute and relative speed development	4
11	Characteristics of main tendency of development. Value of fluctuation and dynamic constancy. Correlation of dynamic row.	4
12	Role and meaning of graphical method. Main elements of graphics. Rules of structure of statistical graphs. Kinds of statistical graphs.	2
13	Subject and method of agricultural statistics	4
14	Essence and functions of indexes. Methodological bases of bunching indexes structure. Aggregate form of indexes and average weighted indexes. Interconnection of indexes. Average indexes.	4
15	Object, tasks and system of statistics for crop production indexes. Statistics of area under crop. Statistics of gross yield of agrarian cultures. Statistics of perennial crops. Statistics of agro-technic. Modern organize of statistical crop production observation in Ukraine.	4
16	Object, tasks and system of statistics for animal husbandry. Statistics of quantity and structure of agrarian animals. Indexes of movement and reproduction of animals. Natural indexes of livestock production. Statistics of zootechnic measures. Modern organize of statistical observation of livestock in Ukraine. Main directions and methods of economic-statistical analysis about pattern and development of animal husbandry.	4
17	Statistics of production resources and efficiency of agricultural production	4
18	Statistics of agricultural products	4
19	Statistics of market goods and services	4
20	Finance statistics	4
21	Price and inflation statistics	4
22	Statistics of investments and securities	4

5. Topics for self-study

№	Topic title	Hours
1	Compilation and grouping (bunching) of statistical data. Statistical tables	5
2	<u>Analysis of the forms of statistical series distribution and</u>	<u>5</u>
3	<u>Generalizing statistical indicators</u>	<u>5</u>
4	<u>Analysis of variation</u>	<u>5</u>
5	<u>Forms of statistical distribution</u>	<u>5</u>
6	<u>Sampling method</u>	<u>5</u>
7	<u>Statistical methods for measuring correlation</u>	<u>5</u>
8	<u>Time series and their analysis</u>	<u>5</u>
9	<u>Analysis of trends and fluctuations</u>	<u>5</u>
10	<u>Statistical tables and graphs</u>	<u>5</u>
11	<u>Index Analysis</u>	<u>10</u>
12	Statistics of production resources and efficiency of agricultural production	10
13	<u>Statistics of agricultural products</u>	<u>6</u>
14	<u>Finance statistics</u>	<u>7</u>
15	<u>Price and inflation statistics</u>	<u>7</u>

6. Methods of assessing expected learning outcomes:

- oral or written survey;
- interview;
- test;
- defending practical works, projects;
- peer-to-peer assessment, self-assessment.

7. Teaching methods:

- problem-based method;
- practice oriented studying method;
- case method;
- project education method;
- flipped classroom, mixed education method;
- research based method;
- learning discussions and debates method;
- team work, brainstorm method.

8. Results assessment.

The student's knowledge is assessed by means of a 100-point scale converted into the national grades according to the "Exam and Credit Regulations at NULES of Ukraine" in force

8.1. Distribution of points by types of educational activities

Type of educational activity	Learning outcomes	Evaluation
1	2	3
Module 1. <i>Steps statistical observation and analysis techniques patterns of distribution</i>		
Practical work 1. Statistical observation	ELO 5, 8, 19. To know object of Statistics, its main category. Statistical methodology.	12
Practical work 2. Compilation and grouping (bunching) of statistical data. Statistical tables	To be able doing statistical observation as method of information providing. Program-methodology questions of statistical observation. Organize questions of statistical observation. Forms, kinds and methods of observation.	12
Practical work 3. Analysis of the forms of statistical series distribution and their graphical representation	To know the essence of statistical bunching, classification and grouping. Principles of forming groups. Statistical tables.	10
Practical work 4. Generalizing statistical indicators	Essence and kind of statistical indexes. Absolute statistical value. Relative values. Average indexes. System of statistical indexes.	12
Practical work 5. Analysis of variations		12
Practical work 6. Forms of statistical distributions		12
Module test 1.		30
Total for module 1		100
Module 2. <i>Methods of statistical analysis</i>		
Practical work 7. Sampling method	ELO 5, 8, 19. To know kinds of interconnections. Regression analysis. Value of tightness and verification of the essence of correlation connection. Rang correlation.	10
Practical work 8. Statistical methods for measuring correlation	To know Characteristics of main tendency of development. Value of fluctuation and dynamic constancy. To be able doing correlation of dynamic row.	10
Practical work 9. Statistical methods for measuring correlation	To know essence and functions of indexes. Methodological bases of bunching indexes structure. Aggregate form of indexes and average weighted indexes. Interconnection of indexes. Average indexes.	10
Individual work 1. Statistical methods for measuring correlation	To know role and meaning of graphical method. Main elements of graphics. Rules of structure of statistical graphs. Kinds of statistical graphs.	10
Practical work 10. Time series and their analysis		10
Practical work 11. Analysis of trends and fluctuations		10
Practical work 12. Statistical tables and graphics		10
Module test 2.		30
Total for module 2		100
Practical work 13. Subject and method of agricultural statistics	ELO 5, 8, 19. To know object, tasks and system of statistics for animal husbandry. Statistics of quantity and structure of agrarian animals. Indexes of movement and reproduction of animals. Natural indexes of livestock production.	10
Practical work 14. Index Analysis		5
Practical work 15. Index analysis (weight indices)		10
Practical work 16. Theme 15. Crop statistics	Modern organize of statistical observation of livestock in Ukraine.	10

Individual work 2. Crop statistics		10
Practical work 17. Livestock statistics		5
Practical task 18. Statistics of production resources and efficiency of agricultural production		10
Practical task 19. Statistics of production resources and efficiency of agricultural production		10
Module test 3.		30
Total for module 3		100
Practical work 20. Statistics of agricultural products	ELO 5, 8, 19. To know subject and task of agricultural products.	23
Practical work 21. Statistics of market goods and services	Gross product, its composition and methods of determining. Estimation of gross output. Indicators of income and profitability	23
Practical work 22. Finance statistics	To study the essence and types of prices. Indicators of the level and structure of prices. Indicators of price dynamics and inflation.	8
Practical work 23. Price and inflation statistics		8
Practical work 24. Statistics of investments and securities	To know subject of market statistics and services. Basic concepts and classifications. Statistics of commodity flows. Statistical monitoring of commodity market conjuncture To learn and know the state budget statistics. Money circulation statistics. Statistics of investment activity. Statistics of credit activity. Statistics of insurance activity.	8
Module test 4.		30
Total for module 4		100
Coursework	$(M1 + M2 + M3 + M4) / 4 * 0,7 \leq 70$	
Exam	30	
Course Total	$(\text{Coursework} + \text{exam}) \leq 100$	
Course Project/Thesis (if applicable)		applicable

8.2. Scale for assessing student's knowledge

Student's rating, points	National grading (exam/credits)
90-100	excellent
74-89	good
60-73	satisfactory
0-59	unsatisfactory

8.3. Assessment policy

Deadlines and exam retaking rules	Works that are submitted late without valid reasons will be assessed with a lower grade. Module tests may be retaken with the permission of the lecturer if there are valid reasons (e.g. a sick leave).
Academic integrity rules	Cheating during tests and exams is prohibited (including using mobile devices). Term papers and essays must have correct references to the literature used
Attendance rules	Attendance is compulsory. For good reasons (e.g. illness, international internship), training can take place individually (online by the faculty dean's consent)

9. Teaching and learning aids:

1) Electronic training course of the discipline «Statistics». URL: <https://elearn.nubip.edu.ua/course/view.php?id=1722>

2) Abstracts of lectures and their presentations (in electronic form). URL: <https://elearn.nubip.edu.ua/course/view.php?id=1722>

3) Макарчук О.Г., Воляк Л.Р. Методичні вказівки для англomовних лекційних занять «Agricultural statistics: methods and indices» з дисципліни «Статистика» для підготовки студентів ОС «Бакалавр» зі спеціальності 051 «Економіка», 2021. 64 с.

4) Макарчук О.Г., Воляк Л.Р. Методичні вказівки для англomовних лекційних занять «Agricultural statistics: economic approaches» з дисципліни «Статистика» для підготовки студентів ОС «Бакалавр» зі спеціальності 051 «Економіка», 2021. 67 с.

5) Макарчук О.Г., Воляк Л.Р. Методичні вказівки для навчальної практики «Methodological Instructions for Performance of Training Practice» з дисципліни «Статистика» для підготовки студентів ОС «Бакалавр» зі спеціальності 051 «Економіка», 2021. 50 с.

6) Makarchuk O.G., Voliak L.R. Methodical guidelines. Statistics (methods for studying the linkages of economic phenomena in agriculture). Educational-methodical publication on Statistics for preparation students of Bachelor degree for the specialty "Economics", 2022. 66 p.

7) Макарчук О.Г. Статистика. Методичні вказівки для лекційних та практичних занять для підготовки студентів ОС "Бакалавр" зі спеціальності 051 «Економіка» освітньої програми «Міжнародна економіка» (Частина 1), К.: НУБіП України. 2024. 74 с.

8) Макарчук О.Г. Статистика. Методичні вказівки для лекційних та практичних занять для підготовки студентів ОС "Бакалавр" зі спеціальності 051 «Економіка» освітньої програми «Міжнародна економіка» (Частина 2), К.: НУБіП України. 2024. 91 с.

9) Makarchuk O.G. Statistics. Methodical guidelines for studying the discipline "Statistics" for students of the first (bachelor's) level of higher education, specialty 051 "Economics", academic programme "International Economics", К.: NUBiP of UKRaine. 2024. 64 p.

10. Recommended sources of information

1. Anderson D.R., Sweeney D.J., Williams T.A. Statistics for Business & Economics, 14th Edition, Cengage Learning, 2019, 1120 p.
2. Hamulczuk M., Makarchuk O., Kuts T. Time-Varying Integration of Ukrainian Sunflower Oil Market with the EU Market. *Agris on-line (Papers in Economics and Informatics)*. 2021. Vol. XIII, №3. P. 35-49.
URL: <https://doi.org/10.7160/aol.2021.130304>
3. Hamulczuk M., Cherevyk D., Makarchuk O., Kuts T., Voliak L. Integration of Ukrainian grain markets with foreign markets during russia's invasion of Ukraine. *Zagadnienia Ekonomiki Rolnej Problems of Agricultural Economics*. 2023. Vol. 377(4). P. 1-25. URL: <https://doi.org/10.30858/zer/177396>
4. Illukkumbura A. Introduction to Regression Analysis (Easy Statistics), 2020, 121 p.
5. Kuts T., Makarchuk O. Environmental Awareness of students of National University of Life And Environmental Sciences (Nules) of Ukraine in the context of modern challenges, *Papers: Management, Economic Engineering in Agriculture & Rural Development*. 2023. Vol. 23 Issue 16, P. 363-370.
URL: https://managementjournal.usamv.ro/pdf/vol.23_2/Art42.pdf
6. Makarchuk O., Kuts T., Voliak L. Green economy in Ukraine: analysis and modelling of development in agriculture. *Grail of Science*, 2024. №46, pp. 264-270. URL: <https://archive.journal-grail.science/index.php/2710-3056/issue/view/29.11.2024/34>
7. Makarchuk O., Kuts T., Labenko O., Kuts O. Market evaluation of rapessed in Ukraine: perspectives and challenges. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural development*. 2024. Vol. 24 (4), pp. 505-513.
URL: https://managementjournal.usamv.ro/pdf/vol.24_4/volume_24_4_2024.pdf
8. Makarchuk O. Sunflower oil market in Ukraine: state and challenges. *Біоекономіка і аграрний бізнес*. 2022 р., НУБіП України. 2022. №2. С. 100-110. URL: <https://economicscience.com.ua/uk/journals/t-13-2-2022/rinok-sonyashnikovoyi-oliyi-v-ukrayini-stan-ta-vikliki>
9. Quirk T. *Excel 2019 in Applied Statistics for High School Students: A Guide to Solving Practical Problems (Excel for Statistics) 2nd ed.*, Springer, 2021, 264 p.
10. Вінничук О. Ю., Григорків М. В., Маханець Л. Л. Статистика: тестові завдання: навч. посібник. Чернівці : Чернівецький нац. ун-т, 2023. 180 с.
11. Горкавий В.К. Статистика: підручник. Третє вид., переробл. і доповн. Київ: Алерта, 2020. 644 с.
12. Городянська Л.В., Сизов А.І. Статистика для економістів: навчальний посібник. Київ: Нац. ун-т ім. Т.Шевченка, 2019. 350 с.
13. Григорків В.С., Вінничук О.Ю., Григорків М.В., Маханець Л.Л. Статистика: основи теорії та практикум: навчальний посібник. Чернівці: Чернівец. нац. ун-т, 2022. 304 с.
14. Козирєва О.В., Федорова В.О. Статистика: навчальний посібник. Х.: Видавництво Іванченка І.С., 2021. 187 с.
15. Кушнір Н.Б. Статистика: навчальний посібник. Київ: Центр учбової літератури, 2019. 208 с.
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20. Офіційний сайт Державної служби статистики України.
URL: <http://ukrstat.gov.ua/>
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URL: <https://dsp.gov.ua/>
22. Офіційний сайт Євростату.
URL: <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home>
23. Офіційний сайт Кабінету Міністрів України.
URL: <http://www.kmu.gov.ua/control/>
24. Офіційний сайт Міністерства економічного розвитку і торгівлі України. URL: <http://www.kmu.gov.ua>
25. Офіційний сайт Продовольчої та сільськогосподарської організації ООН (ФАО). URL: <http://www.fao.org/>
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35. Тютченко С.М. Практикум з навчальної дисципліни «Статистика»: навч.-метод. посіб. Дніпро: ДДУВС, 2022. 52 с.
36. Чекотовський Е. В. Статистика з Microsoft Excel 2016: навч. посіб. Київ: Знання України, 2019. 811 с.