MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

FEDERAL STATE AUTONOMOUS EDUCATIONAL INSTITUTION OF HIGHER EDUCATION

"MOSCOW POLYTECHNIC UNIVERSITY"
(MOSCOW POLYTECHNIC UNIVERSITY)

Faculty of Economics and Management

APPROVED BY
FEU Dean
_____ /A. V. Nazarenko/
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WORKING PROGRAM OF THE DISCIPLINE

«Econometrics»

Direction of training/specialty
38.03.01 Economy

Profile/specialization
International business and foreign economic

Qualification
bachelor

Forms of study
full-time

Moscow, 2025

Developer(s):

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Agreed:

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Content

1. Objectives, tasks and planned learning outcomes for the discipline

The goalmastering the discipline "Econometrics" is mastering the methods empirical research of economic processes, theoretical foundations for constructing reliable econometric models, formation of an in-depth system of knowledge in the field of econometric methods for studying socio-economic processes in the student; determination of directions of development of economic objects based on constructed econometric models.

Main**tasks**study of the discipline:

- familiarizing students with the methods of econometric modeling; teaching
- methods of forecasting economic indicators; explaining the basic patterns and
- influences of individual factors on

financial parameters, interdependencies of these parameters;

- familiarization with various models and methods of conducting financial calculations;
- study of statistical assessment and significance of such distorting effects as

heteroscedasticity of residuals of the dependent variable, multicollinearity of explanatory variables, autocorrelation;

- gaining an understanding of the areas of application and developing skills

use of the studied methods in the practical activities of an employee of the financial service of the organization.

Training on the discipline "Econometrics" is aimed at the formation students have the following competencies:

Code and name of competencies	Indicators of Competence Achievement
OPK-2. Capable of collecting, processing and statistically analyzing data necessary to solve the set economic problems	IOPK-2.1. Carries out collection, processing, systematization of statistical information, substantiates the choice of sources of information necessary for solving economic problems IOPK-2.2. Selects tools for processing statistical material corresponding to the content of the set economic problems
OPK-5. Capable of using modern information technologies and software tools in solving professional tasks	IOPK-5.1. Applies modern information technologies and software tools in solving professional problems IOPK-5.2. Navigates in information flows, highlighting the main and necessary in them, owns the methods of collecting, processing and interpreting the received information, using modern information technologies and applied hardware and software tools, methods of protecting, storing and presenting information

2. The place of the discipline in the structure of the educational program

The discipline is a mandatory part of block B1 "Disciplines (modules)". Studying the discipline is based on the following disciplines, passing practical training:

- Economic theory;
- Linear algebra;
- Mathematical analysis;
- World economy;
- Economic statistics.

The main provisions of the discipline should be used in the future when studying the following disciplines (practices):

- Economy of enterprises and organizations;
- Economy of the industry;
- Finance, money circulation and credit;
- Marketing research;
- Pre-graduation practice.

3. Structure and content of the discipline

The total workload of the course is 4 credit units (144 hours).

3.1 Types of academic work and labor intensity

3.1.1. Full-time education

p/p	Type of academic work	Quantity hours	Semesters	
			4	-
1.	**Classroom lessons**	**72**	**72**	-
	including:			
1.1	Lectures	36	36	-
1.2	Seminars/practical classes	36	36	-
1.3	Laboratory exercises	-	-	-
2.	**Independent work**	**72**	**72**	-
	including:			
2.1	Preparation for practical classes (study of lecture material)	24	24	-
2.2	Preparing for testing	24	24	-
2.3	Solving problems on your own	24	24	-
	Interim assessment			
	credit/differential credit/exam		**Exam**	-
	Total	**144**	**144**	-

3.1.2. Part-time and part-time education

p/p	Type of academic work	Quantity hours	Semesters	
			5	-
1.	**Classroom lessons**	**36**	**36**	-
	including:			
1.1	Lectures	18	18	-
1.2	Seminars/practical classes	18	18	-
1.3	Laboratory exercises	-	-	-
2.	**Independent work**	**108**	**108**	-
	including:			
2.1	Preparation for practical classes (study of lecture material)	36	36	-
2.2	Preparing for testing	36	36	-
2.3	Solving problems on your own	36	36	-
	Interim assessment			
	credit/differential credit/exam		**Exam**	-
	Total	**144**	**144**	-

3.2 Thematic plan for studying the discipline

(by form of education)

3.2.1. Full-time education

p/p	Sections/Topics of the Discipline	Labor intensity, hour					
		Total	Classroom work				Independent Job
			Lectures	Practical classes	Laboratory classes	Practical Preparation	
1.	Theoretical foundations of econometric research	20	4	4	-	-	12
2.	Preparation of the empirical basis for econometric research	16	4	4	-	-	8
3.	Specification of econometric models	18	4	4	-	-	10
4.	Estimation of parameters of regression equations	16	4	4	-	-	8
5.	Identification of pairs econometric models	20	6	4	-	-	10
6.	Identification of multivariate econometric models	18	4	6	-	-	8
7.	Econometric analysis of the dynamics of socio-economic processes	18	6	4	-	-	8
8.	Systems of econometric equations	18	4	6	-	-	8
	Total	**144**	**36**	**36**	**-**	**-**	**72**

3.2.2. Part-time and part-time education

p/p	Sections/Topics of the Discipline	Labor intensity, hour					
		Total	Classroom work				Independent Job
			Lectures	Practical classes	Laboratory classes	Practical Preparation	
1.	Theoretical foundations of econometric research	14	2	-	-	-	12
2.	Preparation of the empirical basis for econometric research	16	2	2	-	-	12
3.	Specification of econometric models	18	2	2	-	-	14
4.	Estimation of parameters of regression equations	18	2	2	-	-	14
5.	Identification of pairs econometric models	18	2	2	-	-	14
6.	Identification of multivariate econometric models	20	2	4	-	-	14
7.	Econometric analysis of the dynamics of socio-economic processes	22	4	4	-	-	14
8.	Systems of econometric equations	18	2	2	-	-	14
	Total	**144**	**18**	**18**	**-**	**-**	**108**

3.3 Contents of the discipline

Topic 1. Theoretical foundations of econometric research Econometrics as a science, the subject of econometrics, the goals and objectives of econometrics, the criteria and principles of econometrics, the main stages of econometric modeling.

General idea of stochastic and deterministic processes, forecasting methods: intuitive, formalized, basic econometric models and their types, application of econometric models

Topic 2. Preparation of the empirical base for econometric research Formation of the empirical base of the study. Preliminary processing of statistical data.

Interpolation of statistical data. Cluster analysis: concept, purpose, tasks

Topic 3. Specification of econometric models

Basic econometric models and their types. Dummy variables. Methods of selecting factors when constructing regression models.

Choosing the Form of a Multiple Regression Equation **Topic 4.**

Estimation of parameters of regression equations

Application of the least squares method to estimate the parameters of paired linear regression. Prerequisites of the least squares method.

Multicollinearity.

Generalized least squares method.

Topic 5. Identification of paired econometric models

Statistical correctness of the econometric model. Identification of a paired linear regression model.

Statistical study of paired nonlinear regression econometric model. Assessment of model adequacy.

Verification of regression models.

Topic 6. Identification of multifactor econometric models

Identification of multiple regression. Partial regression and correlation.

Evaluation of statistical significance of the multiple regression equation.

Topic 7. Econometric analysis of the dynamics of socio-economic processes

Classification and component analysis of time series. Methodology of regression analysis of time series trends.

Methods for measuring the stability of dynamic trends.

Statistical indicators of the strength and intensity of fluctuations. Methods for assessing seasonal fluctuations.

Additive and multiplicative models of trend and seasonality

Topic 8. Systems of econometric equations

The necessity of using systems of equations. Components and forms of systems of equations in econometric research.

Bias and Inconsistency of Least Squares Estimates for Systems of Simultaneous Equations

3.4 Topics of seminars/practical and laboratory classes

3.4.1. Seminars/practical classes Topic 2. Solving problems in cluster analysis Topic 3. Solving problems in multiple regression Topic 4. Solving problems using the least squares method Topic 5. Solving problems in a paired linear regression model

Topic 6. Solving problems on assessing the statistical significance of a multiple regression equation

Topic 7. Solving problems of regression analysis of time series trends

Topic 8. Solving problems on parameter estimation using the least squares method

3.4.2. Laboratory exercises

Laboratory classes for this discipline are not provided for in the curriculum.

3.5 Topics of course projects (course papers)

The curriculum does not provide for a course project (course work) for this discipline.

4. Educational, methodological and informational support

4.1 Regulatory documents and GOSTs

Regulatory documents and GOSTs are not used when studying the discipline.

4.2 Main literature

1. Naumov, I. V. Econometrics. Economic modeling of social-economic processes in territorial systems: a textbook / I. V. Naumov, N. L. Nikulina. - Moscow: IPR Media, 2021. - 127 p. - ISBN 978-5-4497-1408-4. - Text: electronic // Digital educational resource IPR SMART: [site]. - URL: https://www.iprbookshop.ru/115705.html (date accessed: 07/14/2023).

2. Econometrics: basic lecture notes for full-time and part-time bachelors training in the areas of training "Economics", "Business Informatics" / compiled by V. G. Motina. - Simferopol: University of Economics and Management, 2020. - 108 p. - Text: electronic // Digital educational resource IPR SMART: [site]. - URL: https://www.iprbookshop.ru/108065.html (date of access: 03.07.2023).

3. Vygodchikova, I. Yu. Mathematical methods in economics: methods, models, problems: textbook / I. Yu. Vygodchikova. - Saratov: IPR Media, 2020. - 122 p. - ISBN 978-5-4497-0417-7. - Text: electronic // Digital educational resource IPR SMART: [site]. - URL: https://www.iprbookshop.ru/90534.html (date accessed: 13.07.2023).

4. Orlov, A. I. Econometrics: a textbook / A. I. Orlov. - 3rd ed. - Moscow, Saratov: Internet University of Information Technologies (INTUIT), IP R Media, 2020. - 676 p. - ISBN 978-5-4497-0362-0. - Text: electronic // Digital educational resource IPR SMART: [site]. - URL: https://www.iprbookshop.ru/89481.html (date of access: 12.07.2023).

4.3 Further reading

1. Econometrics. Paired regression analysis: practical course / A. V. Logachev, O. M. Logachev, M. V. Pudova, S. E. Khrushchev. - Novosibirsk: Novosibirsk State University of Economics and Management "NINH", 2020. - 184 p. - ISBN 978-5-7014-0958-1. - Text: electronic // Digital educational resource IPR SMART: [site]. - URL: https://www.iprbookshop.ru/106163.html (date of access: 07/15/2023).

2. Motina, V. G. Econometrics. Multiple linear regression. One-factor nonlinear regression. Time series. Part 2: a teaching aid in the areas of training "Economics", "Business Informatics" for bachelors of full-time and part-time education in 2 parts / V. G. Motina. - Simferopol: University of Economics and Management, 2020. - 68 p. - Text: electronic // Digital educational resource IPR SMART: [site]. - URL: https://www.iprbookshop.ru/101405.html (date of access: 06/26/2023).

3. Econometrics: laboratory practical training / compiled by N. A. Checherova. - 2nd ed. — Komsomolsk-on-Amur, Saratov: Amur Humanitarian and Pedagogical State University, IP Ar Media, 2019. - 176 p. — ISBN 978-5-4497-0154-1. — Text: electronic // Digital educational resource IPR SMART: [site]. — URL: https://www.iprbookshop.ru/85837.html (date accessed: 04.07.2023).

4. Econometrics: laboratory practical training / compiled by N. A. Checherova. - 2nd ed. — Komsomolsk-on-Amur, Saratov: Amur Humanitarian and Pedagogical State University, IP Ar Media, 2019. - 176 p. — ISBN 978-5-4497-0154-1. — Text: electronic // Digital educational resource IPR SMART: [site]. — URL: https://www.iprbookshop.ru/85837.html (date accessed: 04.07.2023).

4.4 Electronic educational resources

The electronic educational resource for the discipline "Econometrics" is under development.

4.5 Additional electronic educational resources

1. www.gks.ru – official website of the Federal State Statistics Service RF (date of access: 16.07.2023). – Access mode: free.

2. http://elibrary.ru – scientific electronic library (date of access: 16.07.2023). – Access mode: free.

3. Online course "Quantitative Methods of Economic Analysis" of the platform "Open "Education". - URL:https://openedu.ru/course/hse/QUANEC/?session=2022 (date accessed: 16.07.2023). –Access mode: free.

4.6 Licensed and freely distributed software security

1. Microsoft Office suite programs (Word, Excel, PowerPoint)
2. Jupyter Notebook

4.7 Modern professional databases and information reference systems

1. SPS "ConsultantPlus: Non-commercial Internet version". - URL: http://www.consultant.ru/online/ (date accessed: 16.06.2023). –Access mode: free.

5. Logistics

1. Lecture hall.
2. Auditorium for practical classes.
3. Computer class with Internet access.
4. Audience for group and individual consultations, ongoing monitoring and midterm assessment.
5. Audience for independent work.
6. Library, reading room.

6. Methodological recommendations

6.1 Methodological recommendations for the teacher on the organization training

This section of this work program is intended for beginning teachers and practicing specialists who do not have teaching experience.

The discipline "Econometrics" develops the students' competence in OPK-2 and OPK-5. In the context of constructing educational systems based on the principles of competence-based

approach, there was a conceptual change in the role of the teacher, who, along with the traditional role of the knowledge carrier, performs the function of the organizer of the student's scientific research work, a consultant in the procedures for selecting, processing and interpreting information necessary for practical action and further development, which must be taken into account when conducting lectures and practical classes in the discipline "Econometrics".

Teaching theoretical (lecture) material By discipline "Econometrics" is implemented on the basis of interdisciplinary integration and clear interdisciplinary links within the educational program and curriculum.

The detailed content of individual topics of the discipline "Econometrics" is considered in paragraph 3.3 of the work program.

Sample versions of tasks and test assignments for current monitoring and a list of questions for the exam in the discipline are presented in the FOS for the discipline in paragraph 7 of this work program.

The list of primary and secondary literature, databases and information reference systems required during the teaching of the discipline “Econometrics” is given in paragraph 4 of this work program.

6.2 Methodological instructions for students on mastering the discipline

Acquiring in-depth knowledge of the discipline is achieved through active independent work of students. It is advisable to use the allocated hours to get acquainted with educational and scientific literature on the problems of the discipline, and to analyze scientific concepts.

The discipline provides for various forms of monitoring the level of achievement by students of the stated indicators of mastery of competencies.

Forms of ongoing control – active work in practical classes, testing.

The form of intermediate control in the discipline is an exam, during which the level of achievement of the stated indicators of mastery of competencies by students is assessed.

Methodological guidelines for mastering the discipline.

Lecture classes are conducted in accordance with the content of this work program and represent a presentation of the theoretical foundations of the discipline.

Attendance at lectures is mandatory.

Taking notes on lecture material is permitted both in writing and on a computer.

Regular repetition of the material of lecture notes for each section in preparation for the current forms of certification in the discipline is one of the most important types of independent work of the student during the semester, necessary for high-quality preparation for the midterm certification in the discipline.

Conductingpractical classes in the discipline "Econometrics" is carried out in the following forms:

- survey on materials discussed in lectures and studied independently recommended literature;
- analysis and discussion of issues on topics, problem solving.

Attendance at practical classes and active participation in them is mandatory.

Preparation for practical classes necessarily includes studying lecture notes and recommended literature for an adequate understanding of the conditions and method of completing the tasks planned by the teacher for a specific practical class.

Methodological guidelines for the implementation of various forms of extracurricular independent work

Study of primary and secondary literature in the discipline is conducted on a regular basis in the context of each topic to prepare for the midterm assessment in the discipline "Econometrics". The list of primary and secondary literature on the discipline is given in paragraph 4 of this work program.

Guidelines for preparation for midterm assessment The midterm assessment in the discipline "Econometrics" is conducted in the form of an exam. An approximate list of questions for the exam in the discipline "Econometrics" and the criteria for assessing the student's answer for the purposes of assessing the achievement of the declared indicators of competence formation are provided in the FOS for the discipline in paragraph 7 of this work program.

The student is admitted to the midterm assessment in the discipline regardless of the results of the current academic performance monitoring.

7. Evaluation Fund

7.1 Methods of monitoring and assessing learning outcomes

Code and name competencies	Achievement indicators competencies	Control methods and evaluation
OPK-2. Capable realize collection, processing And statistical analysis data necessary to solve the problems economic tasks	IOPK-2.1. Carries out collection, processing, systematization of statistical information, substantiates the choice of sources of information necessary for solving economic problems IOPK-2.2. Selects tools for processing statistical material corresponding to the content of the set economic problems	Intermediate certification: exam Current control: survey and decision tasks on practical classes; testing
OPK-5. Capable use modern informational technologies and software means at decision professional tasks	IOPK 5.1. - Applies modern information technologies and software tools in solving professional problems IOPK-5.2 navigates information flows, highlighting the main and necessary in them, and is proficient in methods of collecting, processing and interpretation of the received information, using modern information technologies and applied hardware and software, methods of protection, storage and presentation of information	Intermediate certification: exam Current control: survey and decision tasks on practical classes; testing

7.2 Scale and criteria for assessing learning outcomes

7.2.1. Criteria for assessing the answer to the exam

(formation of the competence of OPK-2, indicators of IOPK-2.1, IOPK-2.2 and OPK-5, indicators of IOPK-5.1, IOPK-5.2)

"5" (excellent):the student demonstrates excellent theoretical knowledge, practical skills, knows the terms, makes reasoned conclusions and generalizations,

gives examples, demonstrates fluency in monologue speech and the ability to quickly respond to clarifying questions.

"4" (good):the student demonstrates good theoretical knowledge, practical skills, knows the terms, makes reasoned conclusions and generalizations, gives examples, demonstrates fluency in monologue speech, but at the same time makes minor mistakes that he quickly corrects independently or with minor correction from the teacher.

"3" (satisfactory):the student demonstrates satisfactory theoretical knowledge, demonstrates poorly developed skills in analyzing phenomena and processes, insufficient ability to make reasoned conclusions and give examples, demonstrates insufficient fluency in monologue speech, terms, logic and consistency of presentation, makes mistakes that can only be corrected with correction from the teacher.

"2" (unsatisfactory):the student demonstrates ignorance of theoretical fundamentals of the subject, lack of practical skills, cannot make reasoned conclusions and give examples, demonstrates poor command of monologue speech, does not know the terms, demonstrates a lack of logic and consistency in presentation, makes mistakes that cannot be corrected by the teacher, refuses to answer additional questions.

7.2.2. Criteria for assessing the student's work in practical classes (formation of the competence of OPK-2, indicators of IOPK-2.1, IOPK-2.2 and OPK-5, indicators of IOPK-5.1, IOPK-5.2)

"5" (excellent):all tasks provided for in the practical plan have been completed classes, the student answered all test questions clearly and without errors, and worked actively in practical classes.

"4" (good):all tasks provided for in the practical plan have been completed classes, the student answered all the test questions with corrective comments from the teacher and worked quite actively in practical classes.

"3" (satisfactory):all tasks provided for in the plan have been completed practical classes, with comments from the teacher; the student answered all test questions with comments.

"2" (unsatisfactory):the student did not complete it or completed it incorrectly practical tasks provided for in the practical lesson plan; the student answered the test questions with errors or did not answer the test questions.

7.2.3. Test results evaluation criteria

(formation of the competence of OPK-2, indicators of IOPK-2.1, IOPK-2.2 and OPK-5, indicators of IOPK-5.1, IOPK-5.2)

The test is graded according to the percentage of correct answers given by the student to the test questions.

Standard scale of compliance of test results with the assigned score:

- "excellent" - over 85% correct answers; "good" - from
- 70.1% to 85% correct answers; "satisfactory" - from 55.1%
- to 70% correct answers; from 0 to 55% correct answers -
- "unsatisfactory"

"5" (excellent):the test taker demonstrates excellent theoretical knowledge, has terms and has the ability to quickly respond to test questions.

"4" (good):the test taker demonstrates good theoretical knowledge, has most terms and has the ability to quickly respond to test questions.

"3" (satisfactory):the test taker demonstrates satisfactory theoretical knowledge, has a command of basic terms and concepts.

"2" (unsatisfactory):the test taker lacks theoretical knowledge, He doesn't know the terminology and responds slowly to test questions.

7.3 Evaluation tools

7.3.1. Current control

(formation of the competence of OPK-2, indicators of IOPK-2.1, IOPK-2.2 and OPK-5, indicators of IOPK-5.1, IOPK-5.2)

Examples of problems to be solved in practical classes:

1. For the multiple regression equation = $_0$+ $_1$• $_1$+ $_2$• $_2$V

In accordance with the least squares method, the following system of normal equations was constructed:

36 = 14 $_0$+ 21 $_1$+ 52 $_2$,

{ 89 = 21 $_0$+ 11 $_1$+ 43 $_2$, 112

= 52 $_0$+ 43 $_1$+ 75 $_2$.

Write a matrix to find the partial determinant for the parameter $_1$.

2. For a linear paired regression equation with fifteen observations, the following are known: the following values:∑ x = 22, ∑ x$_2$= 58, ∑ xy$_2$= 167, ∑ yx = 112, ∑ x$_2$y = 205, ∑ y = 34, ∑ y$_2$ = 65. Determine the parameters of the regression equation.

3. Based on the data presented in the table, calculate the Spearman rank coefficient, characterize the obtained value.

1 year	12
2 year	15
3 year	45
4 year	32
5 year	14
6 year	18
7 year	56

4. For the Fourier equation for the third harmonic for twelve observations it is necessary calculate parameter*b*2, if it is known that: ∑*Y*$_t$-846, ∑*Y**cos*t*= -6, ∑*Y**sin*t*= -22.4, ∑*Y** cos2*t*= -6, ∑*Y**sin 2*t*= -10.4, ∑*Y**cos3*t*= -6, ∑*Y**3x3*t*= -6, ∑*Y**cos4*t*= -6, ∑*Y**sin 4*t*= -3.5, ∑*Y**cos5*t*= -6, ∑*Y**5 pcs*t*= [36].

Examples of test tasks:

1) In econometrics, two classes of linear approximating equations are considered regression functions:

a) hyperbolic and exponential;

b) power and exponential; c)
paired and multiple;
c) semi-logarithmic and power.
2) In the paired linear regression model $Y = \alpha + \beta \cdot X + \varepsilon$ ... a)
, are non-random variables, is a random variable; b) is a
non-random variable, , are random variables;
V) is a deterministic variable, , are random variables; G) is a
deterministic variable, , are random variables.

3) In the case of normal distribution of residuals of the linear regression model N(0; $\sigma 2$) estimates of regression parameters obtained by the least squares method, ...
a) equal to zero;
b) distributed according to Student's law;
c) have a normal distribution; d) are
equal to each other.

4) To evaluate the salary of a certain employee, the following is used model$Y_i = \alpha + \beta_1 X_i + \gamma_1 D_i + \gamma_2 C_i + \gamma_3 S_i + \varepsilon_i$, Where$Y_i$- employee's salary; X_i- general his length of service;D_i- a variable that takes on a value1 if the employee has higher education and 0 otherwise;C_i- the number of children the employee has; S_i- variable, taking the value 1 if the worker is a man and 0 if a woman. How many factors in the model are represented by dummy variables?

5) Econometric modeling of dependence on a heterogeneous population data can be carried out on the basis of ...
a) heterogeneous statistical hypotheses;
b) dividing a heterogeneous set of data into homogeneous
ones; c) using standardized variables;
d) using dummy variables.

6) The peculiarity of econometrics as an applied science lies in the existing interrelations of socio-economic indicators characterizing phenomena, processes and their results.
a) schematic description; b)
quantitative measurement; c)
qualitative description; d)
formulation of theory.

7) An error in the specification of an econometric regression model is... a) an
incorrect choice of the form of the regression dependence;
b) estimation of parameters using the least squares method; c)
calculation of quality indicators of models;
d) taking into account random factors.

8) Based on the data from analytical or combinational groupings, it is possible to construct the following called...
a) theoretical regression equation; b)
empirical regression equation; c) any
regression equation;
d) multiple regression equation.

9) The procedure for linearizing regression equations is presented ...

a) taking logarithms;
b) obtaining a function inverse to the original model; c)
estimating the parameters of multiple regression; d)
replacing variables.

10) Square of the partial correlation coefficient $r_{yx\,j*x1x2\,...xj-1xj-1...x,j-(1..k)}$ by yourself...
χ

a) proportion of dispersion y, explained by the variable x_j after removing the effect from variable actions $\{x_1, x_2, ...x_{j-1}, x_{j-1}, ...x_k\}$

b) the proportion of dispersion y, explained by variables $\{y, x_1, x_2..., x_{j-1}x, _{j-1}...x_k\}$

c) proportion of dispersion y, explained by adding a variable x_j to a set of factors variables $\{x_1, x_2, ...x_{j-1}, x_{j-1}, ...x_k\}$

d) proportion of dispersion y, explained by variables $\{x_1, x_2, ...x_{j-1}, x_{j-1}, ...x_k\}$

7.3.2. Interim assessment

(formation of the competence of OPK-2, indicators of IOPK-2.1, IOPK-2.2 and OPK-5, indicators of IOPK-5.1, IOPK-5.2)

1. Types of econometric models
2. Classification of econometric models
3. Stages of econometric modeling. Problems solved during econometric research
4. Collection of statistical data for estimating the parameters of the econometric model
5. The system of normal equations and the explicit form of its solution when estimating by the method least squares linear pairwise regression model
6. Estimation of the coefficients of the paired regression model using sampling regression coefficient
7. Estimation of the variance of the random error of the regression model
8. Consistency and unbiasedness of OLS estimates
9. Efficiency of OLS estimators
10. Characteristic of the quality of the regression model
11. Testing the hypothesis about the significance of the coefficients of the paired regression model
12. Linear multiple regression model
13. Classical least squares method for multiple regression model. Cramer's method
14. Linear multiple regression model with standardized scale
15. Comparable indicators of the closeness of the connection
16. Partial correlation coefficients for a linear regression model with two factor variables
17. Partial correlation coefficients for a multiple regression model with three and more factor variables
18. Construction of partial correlation coefficients for the multiple model regression through the residual variance indicator and the coefficient of multiple determination
19. Multiple Correlation Coefficient. Multiple Correlation Coefficient. determinations
20. Procedure for checking the adequacy of the estimated linear econometric model using Okun's model as an example
21. Definition of multicollinearity. Consequences of multicollinearity. Methods for detecting multicollinearity
22. Methods for eliminating multicollinearity
23. Regression models that are nonlinear in factor variables
24. Regression models that are nonlinear in the estimated coefficients

25. Regression models with breakpoints
26. Correlation and determination indicators for nonlinear regression models
27. Elasticity coefficients
28. Production functions
29. Heteroscedasticity of residuals of a regression model
30. Generalized least squares. Weighted least squares.
squares
31. Regression models with variable structure. Dummy variables
32. Specification of variables
33. Seasonal and cyclical components of time series
34. Seasonal dummies
35. Systems of econometric equations
36. Structural and reduced forms of a system of simultaneous equations.
Model identification
37. Specification and reduced form of econometric models in the form of a system
Simultaneous Equations. The Samuelson-Hicks Econometric Model of the Business Cycle of the
Economy
38. Dynamic econometric models
39. Autoregressive models
40. Distributed lag models
41. Almon Method
42. Nonlinear least squares method. Koik's method
43. The adaptive expectations model
44. Partial (incomplete) adjustment model