

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRARIAN UNIVERSITY
Faculty of Economics and Management
Department of Cybernetics and Informatics
Department of Management named by Professor L.I. Mykhailova**

MODULE SYLLABUS

**SC 1. Economic informatics and methods of empirical and social research
(compulsory/optional)**

Implemented in «Administrative management» Academic Program

Area of specialization D3 «Management»

at the second (master's) level of higher education

Sumy-2025

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Module syllabus agreed at the Department of Management named by Professor L.I. Mykhailova meeting	Protocol № 15 dated 10.06.2025
	Head of Management Department named by Professor L.I. Mykhailova <u>[Signature]</u> Alvina ORIEKHOVA
Module syllabus agreed at the Department of Cybernetics and Informatics meeting	Protocol № 19 dated 04.06.2024
	Head of Cybernetics and Informatics Department meeting <u>[Signature]</u> Svitlana AHADZHANOVA

Approved by:

Guarantor of the Academic program [Signature] Larysa KALACHEVSKA

Dean of the Faculty [Signature] Svitlana LUKASH

Syllabus review (attached) is provided by : [Signature]

Representative of the Department of Education Quality assurance, licensing and accreditation [Signature] (N. Baranik)

Registered in electronic data base 01.07. 2025

1. MODULE OVERVIEW

1.	Title	Economic informatics and methods of empirical and social research		
2.	Faculty/Department	Faculty of Economics and Management/ Management Department Department of Cybernetics and Informatics		
3.	Type (compulsory or optional)	Compulsory		
4.	Program(s) to which module is attached (to be filled in for compulsory types)	« Administrative management » Academic Program, area of specialization D3 « Management »		
5.	Module (to be filled in for optional types)			
6.	Level of the National Qualifications Framework	second (master's) level of higher education		
7.	Semester and duration of module	1 semester, 15 weeks		
8.	ECTS credits number	5		
9.	Total workload and time allotment	Directed study		Self-directed study
		Lectures	Practicals	Labs
		16	14	120
10.	Language of instruction	English		
11.	Module leader	Stoyanets Nataliya – D.of E.S., Professor, Professor at the Management Department Hours of consultations - every Tuesday at 12.15, room 303 e Svitlana Ahadzhanova PhD of Technical Sciences, associate professor, Head of Cybernetics and Informatics Department Hours of consultations - every Tuesday at 12.15, room 307 e		
12.	Module leader contact information	Natalystoyanez@gmail.com svitlana.ahadzhanova@snau.edu.ua		
13.	Module description	Economic informatics and methods of empirical and social research is an applied discipline that studies information technologies used for preparation and decision-making in management, economy and business. The task of the educational component "Economic informatics and methods of empirical and social research": to teach how to use information technologies to solve the problems of studying, describing and researching complex economic systems. Form the applicant's profile and provide an opportunity to gain knowledge about the peculiarities of scientific activity, the content and potential of various empirical methods; to develop the skills and abilities of practical application of appropriate methods during research, interpretation of the obtained data for writing qualification work and scientific articles.		
14.	Module aim	Acquisition of practical skills for working with information technologies, formation of modern information and computer culture in future specialists, acquisition of practical skills for working with modern information technologies for solving various problems in practical activities by profession. In parallel, mastering the methodological foundations and acquiring practical skills in the formation of empirical research; with the use of empirical methods of cognition and modern technologies of team		

		management; conducting observation, conducting an experiment, preparing for surveys, interviews and questionnaires, as well as determining sociometric relationships in the team.
15.	Module Dependencies (prerequisites, co-requisites, incompatible modules)	1.The educational component is based on CC2. 2. The educational component is the basis for CC10 Project planning and evaluation, Qualification work
16.	The policy of academic integrity	normative documents of the Sumy National Agrarian University, in particular the Code of Academic Integrity and the Regulation on Prevention and Detection of Academic Plagiarism at the Sumy NAU. The full list of regulatory documents is available on the university's website. https://snau.edu.ua/viddil-zabezpechennya-yakosti-osviti/zabezpechennya-yakosti-osviti/akademichna-dobrochesnist/).
17	Keywords	Information technologies, economic and mathematical methods and models, optimization, econometric models, regression analysis, empirical methods, research.
18	Link in Moodle	https://cdn.snau.edu.ua/moodle/course/view.php?id=3835 https://cdn.snau.edu.ua/moodle/course/view.php?id=3908

2. CORRELATION BETWEEN MODULE LEARNING OUTCOMES (MLOs) AND PROGRAM LEARNING OUTCOMES (PLOs)

MLOs: On successful completion of the module the learner will be able to:	PLOs		How assessed
	PLO ₁	PLO ₈	
MLOs 1. Ability to abstract thinking, analysis and synthesis. Ability to apply conceptual and basic knowledge, understanding the subject area and the profession of manager.	x		Multiple choice test
MLOs 2. Skills in the use of information and communication technologies to search, process, analyze and use information from various sources. Ability to create and organize effective communications in the management process.		x	Multiple choice test
MLOs 3. To know the essence, place, prerequisites and basic theories of the emergence of empirical research; to understand the acquired knowledge, the subject area, using the theoretical basis and the importance of empirical social research in modern conditions, to be aware of the importance of empirical law in practical activities	x	x	Individual task
MLOs 4. Solve complex specialized tasks and practical tasks in the field of observation, the purpose of a social experiment, its advantages and disadvantages; methods of conducting surveys, questionnaires and interviews	x	x	Individual task

PLO1. Critically consider, choose and use the necessary scientific, methodical and analytical tools for management in unpredictable conditions

PLO8. Apply specialized software and information systems to solve organizational management problems

3. MODULE INDICATIVE CONTENT

Autumn semester

Autumn semester

Topics	Distribution of hours			Self-directed study	Learning resources
	Directed study				
	Lectures	Practicals	Labs		
Topic 1. <i>Concept of economic information.</i> Multilevel structure of economic information, its types, general characteristics, and regularities. Features of economic information transformation. Information environment, information procedures, information process. Representation and encoding of information in computers. Data structure. Algorithm and its properties. Concept of information modeling. Principles of algorithm and program development for solving applied problems. Concept of artificial intelligence. Classification of information technologies by type of information. Information environment and information systems. Types of information systems.	2	2		10	Basic: 1(pp. 5-38) Additional : 1(pp. 17-22)
Topic 2. <i>Automation of data entry and processing, analysis.</i> Tools for automation of data entry and processing. Creating and using links in formulas and calculations. Use of add-in subprograms. Analysis of economic data. Data consolidation.	2	2		10	Basic: 1(pp. 40-48) Additional : 1(pp. 27-32)
Topic 3. <i>Automation of data entry and processing, their analysis.</i> Tools for automation of data entry and processing. Creating and using links in formulas and calculations. Use of add-in subprograms. Analysis of economic data. Pivot tables	2	2		20	Basic: 1(pp. 55-68) Additional : 1(pp. 37-42)
Topic 4. <i>Regression and correlation analysis of data.</i> Using Analysis ToolPak to build regression functions and assess model adequacy. Correlation analysis of data.	2	2		20	Basic: 1(pp. 70-88) Additional : 1(pp. 47-52)
Topic 5. <i>Solving linear programming problems.</i> Building linear models. Methods of calculation for linear models. Analysis of calculation results. Use of application software for solving linear programming problems.	2	2		20	Basic: 1(pp. 82-88) Additional : 1(pp. 57-62)
Topic 6. <i>Simplex method.</i> Solving linear problems using the simplex method with the use of spreadsheet tools.	2	2		20	Basic: 1(pp. 82-88) Ad: 1(pp. 57-62)
Topic 7. <i>Transportation problem.</i> Solving linear problems using the simplex method with the use	2	4		20	B: 1(pp.

of spreadsheet tools.					88-98) A: 1(pp. 60-62)
Total hours block 1	14	16		120	
<p>Topic 1: <i>Characteristics of methods of empirical cognition, features of their application in social work. Theories of empirical research.</i></p> <p>Purpose, subject, object and advantage of empirical methods. Stages of the empirical cycle. Types of methods of empirical social research. Empirical law. Prerequisites for the formation and development of empirical research. Chicago School of Empirical Sociology. Industrial sociology. Structural functionalism. Sociometry (microsociology). The concept of social exchange. Theory of symbolic interactionism. Economic information, its classification and purpose in research activities. Coding of economic information and its use in the research process. Factual information and its use in the research process. Carriers of economic information and their use in the research process. Intelligent systems</p>	2	2		10	1-5
<p>Topic 2: <i>Definitions and documents in sociological empirical research.</i></p> <p>Definitions of the sociological method of research. The main types of documents and their characteristics. Classification of documents. Information systems of international organizations. Government and parliamentary information systems. International mass media, information systems, "Thought Factories".</p>	2	2		20	2-7
<p>Topic 3: <i>Sampling in empirical research. The method of comparison in empirical sociological research. Method of measurement in empirical sociological research.</i></p> <p>The essence and objectives of sampling in empirical research. Types and kinds of sampling. Automatic information processing systems. General principles of collecting information material. Economic information, its classification and purpose in research. Methodological specifics of comparison. Application of the method of comparison in practice. Stages of the comparison method</p> <p>The main indicators when measuring. Basic concepts of measurement. Classification of measurements. Principles and methods of measurement</p>	2	2		10	3-12
Topic 4: <i>Empirical observation as a method</i>	2	2		20	2-12

<p><i>of collecting primary social information. Social experiment and its purpose.</i></p> <p>The main features of sociological observation. Advantages of the method of observation. Disadvantages of the method of observation. The structure of the method of observation. Types of observation. Ways to increase the reliability of data during observation. The essence and place of the experiment in empirical research. Classification of the experiment. The main stages of the experiment. Types of experiment. Forming experiment as one of the main methods of psychological and pedagogical research. Experimental learning as a kind of formative experiment. Implementation of the experimental results. Types of systematization of research results. Bibliographic description of the sources used in the research.</p>					
<p>Topic 5: <i>Sociometry as a type of empirical study of interpersonal relationships in the group.</i></p> <p>Tasks and place of sociometry in research. Sociometric procedure. Processing of results. Sociometric indices. Coding of economic information and its use in the research process. Factual information and its use in the research process</p>	2	2		20	2-10
<p>Topic 6: <i>The role of surveys in the collection of primary social information. Telephone survey, its advantages, disadvantages, purpose.</i></p> <p>Concepts and features of the survey. Stages of organization of surveys. The main types of questions. Basic rules of questionnaire construction. Telephone survey using a computerized CATI system. Financial and economic systems. Security of information systems and technologies.</p>	4	2		20	2-14
<p>Topic 7: <i>Methods of collecting information. The specifics of the interview and its organization. Questionnaire as the main tool of sociological research.</i></p> <p>Diary method of collecting information. Electronic method. The essence and objectives of the interview. Preparation for the interview and determining the venue. Types of questions asked. Non-verbal behavior of respondents and interviewers. Characteristics of the main types of interviews. Basic interview methods. Advantages and disadvantages of the interview. The latest technologies of</p>	2	2		20	1-7

information exchange. Electronic libraries. Types of questionnaires. Basic requirements for compiling the questionnaire. Types of questions and requirements for their preparation. Auxiliary questions. Basic requirements for substantive issues. Choice of questionnaire scale. The latest requirements for the questionnaire. Advantages of the survey					
Total bloc 2.	16	14		120	

4. TEACHING AND LEARNING METHODS

MLOs	Teaching methods (directed study)	Hours	Learning methods (self-directed study)	Hours
MLOs 1. Ability to abstract thinking, analysis and synthesis. Ability to apply conceptual and basic knowledge, understanding the subject area and the profession of manager.	Verbal methods: lecture, explanation, educational discussion Visual methods: demonstration Practical methods: exercises. Method of tutoring	6	Elaboration of theoretical material, solution of calculation tasks	20
MLOs 2. Skills in the use of information and communication technologies to search, process, analyze and use information from various sources. Ability to create and organize effective communications in the management process.	Verbal methods: lecture, explanation, educational discussion Visual methods: demonstration Practical methods: exercises. Method of tutoring	10	Elaboration of theoretical material, solution of calculation tasks	40
MLOs 3. To know the essence, place, prerequisites and basic theories of the emergence of empirical research; to understand the acquired knowledge, the subject area, using the theoretical basis and the importance of empirical social research in modern conditions, to be aware of the importance of empirical law in practical activities	Verbal methods: lecture, explanation, educational discussion Visual methods: demonstration Practical methods: exercises. Method of tutoring	10	Method of ready knowledge The method of formation of abilities and skills Research method Methods of checking and evaluating knowledge, abilities and skills	40
MLOs 4. Solve complex specialized tasks and practical tasks in the field of observation, the purpose of a social experiment, its advantages and disadvantages; methods of conducting surveys, questionnaires and interviews	Verbal methods: lecture, explanation, educational discussion Visual methods: demonstration Practical methods: exercises. Method of tutoring	14	Method of ready knowledge The method of formation of abilities and skills Research method Methods of checking and evaluating knowledge, abilities and skills	20
		30		120

5. ASSESSMENT

5.1. Diagnostic assessment

5.2. Summative assessment

5.2.1. Intended learning outcomes methods:

No	Summative assessment methods	Grades	Deadline
1	Module 1 – multiple choice test	40 points /25 %	According to the approved schedule
2	Module 2 – multiple choice test	30points /25 %	According to the approved schedule
4	Presentation preparation	15 points /15 %	According to the approved schedule
6	Multiple choice test	15 points /15 %	At 15 weeks

5.1.1. Grading criteria

Summative assessment method	Unsatisfactory	Satisfactory	Good	Excellent
Multiple choice test	<20 points	20-25 points	25-30 points	31-40 points
	Less than 60% of correct answers	60% - 74% of correct answers	75% - 89% correct answers	90-100% correct answers
Multiple choice test	<10 points	10-14 points	15-20 points	21-30 points
	Less than 60% of correct answers	60% - 74% of correct answers	75% - 89% correct answers	90-100% correct answers
Presentation preparation	<9 points	9 – 10 points	11- 13 points	14 – 15 points
	Task requirements not met	Present research results in different ways	Present research results in an appropriate format	Present research results in a way that is most appropriate in certain circumstances, using different forms of information presentation
Multiple choice test	<9 points	9 – 10 points	11- 13 points	14 – 15 points
	Less than 60% of correct answers	60% - 74% of correct answers	75% - 89% correct answers	90-100% correct answers

Formative assessment

Formative exercises are designed to enable students to develop particular aspects of their learning, prior to summative assessments. Formative exercises are designed to help students use feedback and self-reflection to manage and develop their learning so that they can see how to improve their work.

No	Formative Assessment elements	Date
1	Testing in Google Forms, Kahoot, Quizizz	At each practical lesson (introductory control)
2	Oral feedback from the teacher and students on the implementation of individual calculation and analytical tasks	For 3 weeks
3	Oral feedback from the teacher and students on the performance of an individual task on the main types of empirical social research	For 9 weeks
4	Oral feedback from the teacher and students on the implementation of the individual task of choosing sociometric criteria	For 11 weeks
5	Oral feedback from the teacher and students on the project implementation (preparation, presentation, defense)	For 14 weeks

5.1 The evaluation scale is generally accepted for the University

Evaluation scale: national and ECTS

The sum of points for all types of educational activities	Evaluation on a national scale (when counting)
90 - 100	counted
82-89	
75-81	
69-74	
60-68	
35-59	not credited with the possibility of repeating drafting
0-34	not enrolled with mandatory repeated study of the discipline

6. LEARNING RESOURCES (Bloc 1.)

6.1. Key resources

1. Kenneth C. Laudon and Jane Price Laudon. Management Information Systems: Organization and Technology, 6th edition, by Kenneth C. Laudon and Jane Price Laudon, produced by Prentice-Hall, a division of Pearson Education.

6. 2 Methodical resources

1. S.Ahadzhanova Economical Informatics(e-course in Moodle:Address – <https://cdn.snau.edu.ua/moodle/course/view.php?id=3908>)
2. Economic informatics and methods of empirical social research. Lecture notes for applicants of the second master's level of full-time higher education, specialty 073 «Management» SP «Administrative Management» (150 стор., 7,8 д.а.),№7 від 20.02.2025
3. Economic informatics and methods of empirical social research. Methodical recommendations for practical classes for applicants of the second master's level of full-time higher education, specialty 073 "Management" SP "Administrative Management"№7 від 20.02.2025
4. Economic informatics and methods of empirical social research. Methodological guidelines for independent work and completion of individual tasks for applicants of the second master's level of full-time higher education, specialty D3 «Management» SP «Administrative Management» (41 стор., 1,9 д.а.), №9 від 24.04.2025

6.2. Soft ware

1. R-programing. URL: <https://www.r-project.org/>
2. Power BI
3. MS Excel URL: <https://www.microsoft.com/en-us/microsoft-365/excel>

6.3. Additional resources

1. Lindsay, John (2016). Information Systems – Fundamentals and Issues. Kingston University, School of Information Systems.
2. Dostal, J. School information systems (Skolni informacni systemy). In Infotech 2017 - modern information and communication technology in education. Olomouc, EU: Votobia, 2017. p. 540 – 546. ISBN 978-80-7220-301-7.
3. O'Leary, Timothy and Linda. Computing Essentials Introductory 2018. McGraw-Hill on Computing 2018.com.

6.3. Soft ware

4. R-programing. URL: <https://www.r-project.org/> (дата звернення – 25.05.2023р.)
5. MS Excel URL: <https://www.microsoft.com/en-us/microsoft-365/excel> (дата звернення – 25.05.2023р.)

6. LEARNING RESOURCES (bloc 1.)

1. Kirtika Sharma. Basics of Research Methodology for Management and Social Sciences. LAP LAMBERT Academic Publishing, 2018. 168 p <https://www.amazon.com/Research-Methodology-Researchers-Management-Sciences/dp/8120329910>
2. Dave Harris. Literature Review and Research Design: A Guide to Effective Research Practice: Taylor & Francis. 2019y. 345p.
2. Dr. Vijaykumar Ambadasrao Patil Research Methods in Literature: An Introduction 2019. 164 p <https://www.amazon.in/Research-Methods-Literature-Vijaykumar-Ambadasrao/dp/B081LV8GWJ>
3. George Thomas. Research Methodology and Scientific Writing 2nd Edition. Publisher: Ane Books, New Delhi 2019.628p.
4. R. Panneerselvam. Research Methodology (Second Edition). PHI Learning.2016.720p.
5. Vicenc Fernandez. Fundamentals of Research Methodology: A Reference Book for PhD Students in Management 1st Edition. OmniaScience, 2020.141p.
6. Rubee Singh. Fundamentals of Research Methodology. Crescent Publishing Corporation Delhi 2021.450p.
https://www.researchgate.net/publication/354077539_Fundamentals_of_Research_Methodology
7. Faizan Danish, Anil Bhat Research Methodology for Social Sciences An Elementry Book for Researchers. Hardbound. 2019 350p.
8. Stoyanets N.& Hu Z. Impirical correlation analysis between land use and village cadre corruption. Науковий вісник Одеського національного економічного університету. Одеса: ОНЕУ. 2021. № 11-12 (288-289). С. 82-87. 10.32680/2409-9260-2021-11-12-288-289-82-87
9. T. A Vasilyeva; O. V Kuzmenko; N. V Stoyanets; A. E Artyukhov; V. V Bozhenko The depiction of cybercrime victims using data mining techniques Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu. 2022, (5): 174 – 178 <https://doi.org/10.33271/nvngu/2022-5/174> (Scopus).

6.2. Guidelines

1. Stoyanets N. S.Ahadzhanova Economic informatics and methods of empirical social research. Lecture notes for applicants of the second master's level of full-time higher education, specialty 073 «Management» SP «Administrative Management» (150 стор., 7,8 д.а.),№7 від 20.02.2025
2. Stoyanets N. S.Ahadzhanova Economic informatics and methods of empirical social research. Methodical recommendations for practical classes for applicants of the second master's level of full-time higher education, specialty 073 "Management" SP "Administrative Management"№7 від 20.02.2025
3. Stoyanets N. S.Ahadzhanova Economic informatics and methods of empirical social research. Methodological guidelines for independent work and completion of individual tasks for applicants of the second master's level of full-time higher education, specialty D3 «Management» SP «Administrative Management» (41 стор., 1,9 д.а.),№9 від 24.04.2025
4. Educational and methodical materials based on the Moodle platform <https://cdn.snau.edu.ua/moodle/course/view.php?id=3835>

Electronic textbooks for course

2. Guijuan Lin Higher Education Research Methodology-Literature Method <https://files.eric.ed.gov/fulltext/EJ1065734.pdf>
3. Wiersman, William. Introduction to educational research methods. Translated by Zhenguo Yuan. Education and Science Press. <http://repository.umpwr.ac.id:8080/bitstream/handle/123456789/3710/Fundamentals%20of%20Educational%20Research.pdf?sequence=1>
4. Research Methods in Education <https://gtu.ge/Agro-Lib/RESEARCH%20METHOD%20COHEN%20ok.pdf>