Syllabus of the course
«*Mathematical methods and models in scientific research*»

Specialty	*073 Management*
Study Programme	*Management*
Study cycle (Bachelor, Master, PhD)	*Third (educational and scientific)*
Course status	*Mandatory*
Language	*English*
Term	*2nd year, 3rd semester*
ECTS credits	*The number of credits according to the curriculum is 5*
Workload	*Lectures – 20 hours*
	Laboratory studies – 20 hours
	Self-studies - 110 hours
Assessment system	*Grading*
Department	*Economic Cybernetics and System Analysis Department, room 419 (main building), (057)702-06-74 (3-56), https://ek.hneu.edu.ua/*
Teaching staff	*Guryanova Lidiya Semenivna, Professor of Economic Cybernetics and System Analysis Department, Doctor of Economics, Professor*
Contacts	*guryanovalidiya@gmail.com, https://ek.hneu.edu.ua/vykladachi/gur-yanova-lidiya-semenivna/;*
Course schedule	*Schedule of classes: http://services.hneu.edu.ua:8081/schedule/selection.jsf*
Consultations	*Schedule of consultations: https://ek.hneu.edu.ua/;*

The purpose of the educational discipline

Study of the theoretical foundations and possibilities of practical application of methods of modelling systems operating under conditions of uncertainty during scientific research.

Prerequisites for study
Structural and logical scheme of the course

Prerequisites	Postrequsites
Philosophy of Science, Methodology and organization of scientific research	Scientific research work

Course content

Content module 1. Methods and models of multidimensional data analysis
Topic 1. Modelling as a method of scientific knowledge of complex systems. Peculiarities of the application of cluster analysis methods.
Topic 2. Classification with training. Methods of discriminant analysis
Topic 3. Methods of reducing the feature space
Topic 4. Models and methods of factor analysis
Content module 2. Methods of advanced econometrics
Topic 5. Problems of developing econometric models
Topic 6. Models with discrete variables
Topic 7. Panel data models
Topic 8. Dynamic models. VAR and ECM models

Teaching environment (software)

Multimedia projector, S. Kuznets KhNUE PLS, ZOOM, EViews, R, Python

Assessment system

The system for evaluating the developed competencies of graduate students takes into account the types of classes that, according to the program of the academic discipline, include lectures, laboratory classes, as well as self-studies. The evaluation of the developed competences is carried out according to the accumulative 100-point system. Control measures include:

current control, which is carried out during the semester during lectures and laboratory classes and is evaluated by the amount of points scored;

module control, which is carried out taking into account the current control of the corresponding content module and aims at an integrated assessment of the learning results

Current control of this academic discipline is carried out in the following forms:

defense of laboratory assignments;

carrying out control works;

performing of an individual research project.

Modular control is carried out in the form of complex control work. The modular control is carried out at the S. Kuznets KhNUE PLS after all the theoretical material has been reviewed and individual tasks have been completed within each of the two modules. More detailed information on the system of evaluation and accumulation of points for the academic discipline is provided in the work plan (technological card) for the academic discipline.

Course policies

Teaching of the academic discipline is based on the principles of academic integrity.

Violation of academic integrity includes academic plagiarism, fabrication, falsification, cheating, deception, bribery, and biased assessment.

Education seekers may be brought to the following academic responsibility for breach of academic integrity: repeated assessment of the corresponding type of learning activity.

More detailed information about competencies, learning outcomes, teaching methods, assessment forms, self-study is given in the Course program