POLTAVA UNIVERSITY OF ECONOMICS AND TRADE

Educational and scientific institute of day education

Department of computer science and information technology

SYLLABUS

Of educational disciplines

"Computer analysis of statistical data"

for 2026- 2027 educational year

Course and semester of study	1 course, 2 semester
Educational program/specialization	F3 Computer science
Specialty	F3 Computer science
Branch of knowledge	F "Informative technologies"
Degree of higher education	Master

Full name of Teacher, scientific degree and scientific rank, position at the department information technology

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Schedule educational classes	http://schedule.puet.edu.ua/
Consultations	online: information on the department website, Student tab
Page of distance course	https://el.puet.edu.ua/

Description educational disciplines

The purpose of studying the discipline	The main purpose of studying the discipline "Computer analysis of statistical data" is to form an idea of the methods of statistical data processing using computer technology to solve practical problems of economics and management; develop the skills to select appropriate statistical models and methods for the available data.
Duration	5 ECTS credits/150 hours (lectures 12 hours, laboratory classes 28 hours, independent work 110 hours)
Forms and methods of teaching	Lectures and laboratory classes in the classroom, independent work outside the schedule Methods: verbal, visual, practical, interactive
Current and final control system	Current control: attending classes; current modular work Final control: PMK
Basic knowledge	Special (Professional) Competencies for the Specialty 122 Computer Science in the Field of Knowledge 12 Information Technology for the First (Bachelor's) Level of Higher Education
Language of teaching	English

List of competencies, which provides given educational discipline, programming results of teaching

Programming results of the teaching	***Competencies that the students should have.***
PR1. Have specialized conceptual knowledge that includes modern scientific achievements in the field of computer science and is the basis for original thinking and research, critical understanding of problems in the field of computer science and on the verge of fields of knowledge. PR8. Develop mathematical models and methods of data analysis (including big).	CC1. Ability to abstract thinking, analysis and synthesis. CC2. Ability to apply knowledge in practical situations. CC3. Ability to communicate in the state language both orally and in writing CC5. Ability to learn and master modern knowledge CC7. Ability to generate new ideas (creativity).

PR19. Analyze the current state and global trends in the development of computer science and information technology	SC1. Awareness of the theoretical foundations of computer science.. SC3. Ability to use mathematical methods to analyze formalized domain models. SC4. Ability to collect and analyze data (including big data) to ensure the quality of design decisions. SC10. Ability to evaluate and ensure the quality of IT projects, information and computer systems for various purposes, apply international standards for assessing the quality of information and computer systems software, models for assessing the maturity of information and computer systems development processes. SC11. Ability to initiate, plan and implement processes for the development of information and computer systems and software, including its development, analysis, testing, system integration, implementation and maintenance.

Thematic plan of the educational disciplines

Name of the topics	***Types of works***	***Tasks of independent work in the context of topics***
Module 1 Analysis of statistical data		
Topic 1. Basics of econometrics	attending classes; survey in the classroom; survey in the process of individual-advisory sessions to check assimilation of the material of missed classes.	study of lecture material; preparation for laboratory tasks; execution of home works; work with literature.
Topic 2. Computer in statistical calculations	attending classes; survey in the classroom; survey in the process of individual-advisory sessions to check assimilation of the material of missed classes making of modular control works	study of lecture material; preparation for laboratory tasks; execution of home works; work with literature.

Literature

1. VanderPlas, S. (2025). *Statistical Computing using R and Python*. Онлайн-підручник — містить чисельні методи, статистичні обчислення, обробку даних, аналіз та візуалізацію. https://srvanderplas.github.io/stat-computing-r-python/
2. Fabio Nelli. Python Data Analytics: With Pandas, NumPy, and Matplotlib 3rd ed. Edition. – Apress, 2023. – 466 p
3. Haoxiang W. et al . Big data analysis and perturbation using data mining algorithm // Journal of Soft Computing Paradigm (JSCP). – 2021. – T. 3. – No. 01. – P. 19-28.
4. Shi Y. Advances in big data analytics: theory - algorithms and practices. – Springer Nature, 2022.
5. Miles M. B., Huberman A. M., Saldana J. Qualitative Data Analysis: A Methods Sourcebook. – SAGE Publications, 2018.
4. Gorokhovatsky V.A., Tvoroshenko I. C. methods of mining and data processing: tutorial. Manual, 2021.
5. Odarushchenko O.B. Analysis of features of data mining systems/O.B. Odarushchenko, N.M. Protas, and L.M. Degtyareva - Publishing House "Baltija Publishing", 2022. URL: http://baltijapublishing.lv/omp/index.php/bp/catalog/download/186/5536/11613-1?inline=1
6. Mogilny S. B. Machine learning using microcomputers: teaching method. by/edited by A.V. Lesnoy et al. Kyiv, 2019. - 226 s.
7. Reddy, Eguturi Manjith Kumar, Akash Gurrala, Vasireddy Bindu Hasitha, and Korupalli V. Rajesh Kumar. "Introduction to Naive Bayes and a Review on Its Subtypes with Applications." Bayesian Reasoning and Gaussian Processes for Machine Learning Applications (2022): 1-14.
8. Gorokhovatsky V.A. Analysis of multidimensional data on the description in the form of multiple components: monograph/V.O. Gorokhovatsky, I. S. Tvroshenko. - Kharkiv: KNURE, 2022. - 124 p.
9. Koshova, O. P., Olkhovska, O. V., & Brazhnichenko, A. O. (2024). Enhancing the Efficiency of Managerial Decision-Making in IT Projects Through Simulation Modeling Methods. *Tavriiskyi Scientific Bulletin. Series: Technical Sciences*, (3), 39-50. https://doi.org/10.32782/tnv-tech.2024.3.5
10. Venkatasubramanian, S., & Woodruff, D. P. (2024). A Survey on Statistical Methods for Big Data Analysis. *ACM Computing Surveys, 56*(4), 1–45. https://doi.org/10.1145/3604934

Software of educational disciplines

- A personal computer or laptop with stable Internet.
- PUET's distance learning system and its video conferencing tools.
- Microsoft products, programs, and services.
- Anaconda and Python.

Policy for studying of academic discipline and evaluation

The policy of evaluation of applicants for higher education: tasks that are submitted in violation of the terms without valid reasons are evaluated for a lower grade (75% of the possible maximum number of points for the type of activity). Re-assembly of modules occurs with the permission of the leading teacher in the presence of valid reasons (for example, sick leave).
Regulations on the organization of the educational process https://puet.edu.ua/wp-content/uploads/2023/06/polozhennya-pro-organizacziyu- osvitnogo-proczesu.pdf
Regulations on the procedure and criteria for assessing the knowledge, skills and abilities of applicants for higher education https://puet.edu.ua/wp- content/uploads/2023/07/polozh_por_kryt_ocinyuvannya.pdf
The procedure for the elimination of academic debt by applicants for higher education https://puet.edu.ua/wp-content/uploads/2023/07/poryadok-likvidacziyi-zdobuvachamy-vyshhoyi-osvity-akademichnoyi-zaborgovanosti.pdf
Attendance policy: Attendance is a mandatory component. For objective reasons (for example, illness, employment, internship), training can take place in an online form (Moodle) in agreement with the leading teacher.
Academic integrity policy: students must consciously adhere to academic integrity; prevent cheating (from each other, from personally written text, printed or electronic media, etc.) while performing individual training tasks and didactic tests; qualitatively draw up links to sources of information when writing reports, preparing presentations, abstracts, etc.
The PUET operates:
Student's Code of Honor https://puet.edu.ua/wp-content/uploads/2023/07/kodeks_chesti_studenta.pdf.
Academic Integrity Regulation https://puet.edu.ua/wp-content/uploads/2023/07/polozh_akadem_dobrochesnist.pdf Academic Plagiarism Prevention Regulation https://puet.edu.ua/wp-content/uploads/2023/07/polozhennya-pro- zapobigannyavypadkam-akademichnogo-plagiatu.pdf
The policy of recognition of training results is defined by the following documents:
Regulations on the procedure for recalculating the results of training obtained in foreign and domestic educational institutions of https://puet.edu.ua/wp-content/uploads/2023/07/polozh_por_perezarah_rez_zvo.pdf.
Regulations on academic mobility of higher education applicants https://puet.edu.ua/wp-content/uploads/2023/07/polozha_pro_akademichnu_mobilnist.pdf
Regulations on the procedure for recognition of learning outcomes obtained through informal and/or informative education https://puet.edu.ua/wp-content/uploads/2023/07/polozhennya-pro-poryadok-vyznannya-rezultativ-navchannya-zdobutyh-shlyahom-neformalnoyi-ta-abo-informalnoyi-osvity.pdf; infographics (section Education/Organization of the educational process/Non-formal education) https://puet.edu.ua/neformalna-osvita/.
Conflict Resolution Policy:
Regulation on conflict resolution rules https://puet.edu.ua/wp-content/uploads/2023/07/polozhennya-pro- pravyla-vyrishennya-konfliktnyh-sytuaczij-u-puet.pdf
Provision on the appeal of the results of the final control in the form of an exam https://puet.edu.ua/wp-content/uploads/2023/07/poloz_pro-apel_pidscontr.pd f
authorized person for the prevention and detection of corruption https://puet.edu.ua/zapobigannya-ta-protidiya-korupciyi/.
Policy to support participants in the educational process:
Psychological service: http://puet.edu.ua/psyhologichna-pidtrymka-v-puet/.
Student Ombudsman (Commissioner for Student Rights) PUET http://puet.edu.ua/other-divisions/studentskyj- ombudsman-upovnovazhenyj-z-prav-studentiv-puet/
Commissioner for Corruption Rights https://puet.edu.ua/zapobigannya-ta-protidiya-korupciyi/
Safety of the educational environment: Information on the safety of the PUET educational environment is given in the "Life safety" tab http://puet.edu.ua/pro-puet/bezpeka-zhyttyediyalnosti/

Assessment

The final grade for the study of the discipline is calculated through the current assessment

Form of educational work	Kind educational work	Points
1. Auditorium 1.1. Lectures	• Attending of all lectures and laboratory	20
1.2. Practical classes	• Preparation for practical work and its implementation (3x18=54)	54
2. Final control.	MW#1	13
	MW#2	13
Total		100

The awarding of extra points for academic discipline work is based on the types of work performed

Form of work	Type of work	Points
Scientific and research	Completion of additional educational courses, writing, and public defense of a scientific abstract on topics outlined in the independent work assignments within the scope of the themes.	10

For additional types of educational work, a student can receive no more than 10 points. Additional points are added to the total final score for studying the discipline, but the total final score cannot exceed 100 points.

Scale of evaluation of students based on the results of studying the discipline

The sum of points for all types educational activity	*Score for the ECTS scale*	*Assessment on a national scale*
90-100	A	Perfectly
82-89	B	Very good
74-81	C	Fine
64-73	D	Satisfactorily
60-63	E	Satisfy enough
35-59	FX	Unsatisfactory with the possibility of reassembly
0-34	F	Unsatisfactory with mandatory repeated study of the academic discipline