

Министерство образования Республики Беларусь
 Учреждение образования
 «Гродненский государственный университет
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APPROVED
 « 01 » February 2021 y.
 Chairman
 of the Admissions Committee
 Rector of Yanka Kupala State
 University of Grodno
 I. Kiturka

THE LIST OF TOPICS OF EDUCATIONAL DISCIPLINES
 for an additional interview with applicants
 from among foreign citizens and stateless persons,
 temporarily staying or temporarily residing in the Republic of Belarus,
 for obtaining second stage of higher education in the specialty
**1-31 80 09 «Applied Mathematics and Informatics» (profilisation «Computer Data
 Analysis»)**
 (English language of tuition)

Name of the educational discipline	The list of topics of the educational discipline
Advanced mathematics; Probability theory; Mathematical programming; Fundamentals of information technology; Technologies of organization and data processing; Internet technology basics	<ol style="list-style-type: none"> 1. Derivative. 2. Investigation of functions by means of a derivative on monotonicity, extremum, convexity, inflection points, and graph construction. 3. Primitive and indefinite integral. 4. The concept of a definite integral and its geometric meaning. The Newton-Leibniz formula. 5. Matrices. Operations over matrices. The determinant of a square matrix and methods of its calculation. Finding the inverse matrix. Eigenvalues and vectors. 6. Systems of linear algebraic equations and methods for its solving (Cramer method, inverse matrix method and Gauss method). 7. Vectors. Operations on vectors. Scalar product of vectors. Orthogonality criterion and the criterion of collinearity of two non-zero vectors. 8. Functions of two variables. 9. Extremum of a function of two variables. 10. Types of distribution of variables. 11. Numerical characteristics of a random variable. 12. Limit theorems of probability theory. 13. General formulation and mathematical model of the problem of mathematical programming. 14. Game theory. Basic concepts: game, strategy. Examples. Antagonistic games. Solution of the matrix game in pure strategies, mixed strategies. Statistical games. Example. Criterion of Wald, Savage, Bayes, Hurwitz. 15. Fundamentals of graph theory. Network models and their application for planning and management (STC). 16. Transport problem and its application. 17. Microsoft Word. Main features of Microsoft Word for text processing. 18. Microsoft Word. Additional features of MS Word. 19. Using the database in Microsoft Excel.

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| | <ol style="list-style-type: none">20. Built-in functions of MS Excel for solving tasks of processing economic information.21. Additional MS Excel tools (parameter selection, scenario manager, lookup table) during financial analysis.22. Methodology of procedural-oriented programming.23. The concept of an information system.24. Application of the information system in the enterprise.25. Processing and storage of data, databases and DBMS.26. The concept of a query to a database. Access.27. Fundamentals of computer networks.28. The concept of the Internet.29. A website as an Internet unit.30. Hypertext markup language: HTML.31. Types of sites for doing business on the Internet. |
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