

Ministry of Science and Higher Education of the Russian Federation
federal state budget educational institution higher education

«Kuban State University»

Faculty of Economics

APPROVED:

Vice-Rector for Academic

Department,

Quality of Education –

First Vice-Rector



Khagurov T.A.

2026 June 2026

DISCIPLINE PROGRAM

B1.V.04 SYSTEMS ANALYSIS AND DECISION-MAKING

Specialty	38.04.02 Management
Orientation (profile) / specialization	Business management and international entrepreneurship
Form of education	full-time
Qualification	Master

Krasnodar 2026

WORKING PROGRAM OF THE DISCIPLINE

“System Analysis and Decision Making”

(For the field of training 38.04.01 “Economics”, master’s program “Financial Economics”)

1. Goals and Objectives of Studying the Discipline

1.1 Purpose of Mastering the Discipline

To obtain theoretical and practical knowledge in the field of system analysis and decision making, to understand the essence of system analysis as a methodology for studying complex objects and processes, as well as to become familiar with instrumental and technical means of decision making.

1.2 Objectives of the Discipline

- Provide a modern methodological and theoretical foundation for the practical activities of master’s students in the field of innovation.
- Reveal the nature and essence of the system approach to organizing scientific research.
- Discuss conceptual and methodological issues of the theory and practice of system research and decision making.
- Examine examples of applying system research methods and decision theory in organizational management.
- Form in future specialists the conviction of the necessity to participate in research activities.

1.3 Place of the Discipline in the Structure of the Educational Program

The discipline “System Analysis and Decision Making” belongs to the part formed by participants of educational relations of Block 1 “Disciplines (Modules)” of the curriculum 38.04.01 “Economics”, master’s program “Financial Economics”. Prerequisite courses: “Modern Information Technologies in Economics”, “Economic Analysis (advanced level)”, etc.

Courses that use material from this discipline: “Strategic Management and Marketing”, “Methods of Organizational and Managerial Decision Making”, “Company Value Assessment and Management”, etc.

1.4 Planned Learning Outcomes (Competencies)

UC-1 – Capable of carrying out critical analysis of problem situations based on a system approach, developing a strategy of action.

IUC-1.1 – Identifies a problem situation, on the basis of a system approach carries out its multi-factor analysis and diagnosis.

- Knows: principles of the system approach.
- Is able to: design management systems, identify deviations and analyze causes of actual or potential deviations in the operation of a process management system.
- Possesses: methods of identifying deviations in the operation of a process management system, methodologies for identifying causes of deviations.

PC-4 – Capable of managing an investment project.

IPC-4.1 – Demonstrates the ability to manage the effectiveness of an investment project.

- Knows: principles of system analysis, decision theory in the implementation of an investment project.
- Is able to: decompose an investment project into standard stages with clearly established results; describe the detailed distribution of roles and powers among project participants and corresponding interconnections.
- Possesses: methods of system analysis to determine the sequence of operations for project implementation.

IPC-4.3 – Applies risk management tools for an investment project.

- Knows: system analysis, decision theory within the framework of investment project implementation.
- Is able to: collect, analyze, systematize information and data, document complete and exhaustive requirements for projects and processes of the organization and their resource environment.
- Possesses: methods of system analysis to identify and document project risks; assess and rank identified risks by probability and impact on project result.

IPC-4.4 – Demonstrates the ability to manage deadlines and control the implementation of an investment project.

- Knows: principles of system analysis, decision theory in project implementation.
- Is able to: draw up work plans for the project; develop documents and reports; collect, analyze, systematize information, document requirements.
- Possesses: methods of schedule planning and schedule management; control of current interim results; development of a work schedule for monitoring contract obligations; assessment of interim results compliance; identification of deviations from the schedule and analysis of reasons.

2. Structure and Content of the Discipline

2.1 Distribution of Labor Intensity by Types of Work

Total labor intensity: 2 credit units (72 hours).

Full-time (1st semester):

- Contact work: 24.2 hours (lectures 6, laboratory 18, other 0.2)
- Independent work: 47.8 hours
- Total: 72 hours

Part-time (1st year):

- Contact work: 12.2 hours (lectures 4, laboratory 8, other 0.2)
- Independent work: 56 hours
- Control: 3.8 hours
- Total: 72 hours

2.2 Structure of the Discipline (Full-time)

Section 1. Systems and patterns of their functioning and development. Basic principles of system analysis.

- Total: 14 hours (lectures 2, laboratory 2, independent 10)

Section 2. Fundamentals of system analysis.

- Total: 14 hours (lectures 2, laboratory 2, independent 10)

Section 3. Methodology of system analysis.

- Total: 14 hours (lectures 0, laboratory 4, independent 10)

Section 4. Modern technologies of system analysis.

- Total: 14 hours (lectures 0, laboratory 4, independent 10)

Section 5. Business Intelligence systems.

- Total: 15.8 hours (lectures 2, laboratory 6, independent 7.8)

Intermediate assessment (ICI): 0.2 hours

Total: 72 hours (lectures 6, laboratory 18, independent 47.8)

(Part-time structure also provided but omitted here for brevity; similar with reduced classroom hours.)

2.3 Content of Sections

Lecture-type classes

Section 1 – Systems and patterns of their functioning and development

- Content: Concept of a system. Transient processes. Feedback principle. Methods and models of systems theory. Controllability, attainability, stability of systems in decision-making processes.

- Control: testing

Section 2 – Fundamentals of system analysis

- Content: System analysis as the most constructive direction for studying management processes. Features of system analysis of economic objects. Areas of application. Formation of analysis goals. Decision-making methods based on system analysis results.

- Control: oral questioning

Section 3 – Approaches to analysis and design of systems. Methodology of system analysis.

- Content: Collection of data on system functioning in decision making. Study of information flows. Study of resource capabilities. Improving assessment reliability using a priori information. Analysis of management system structure. Indicators and criteria for system evaluation. PATTERN methodology. Methodologies by F.I. Peregudov and F.P. Tarasenko, R. Ackoff and F. Emery.

- Control: oral questioning

Section 4 – Modern technologies of system analysis

- Content: Concept of system analysis technology. Specialized system analysis technologies. IDEF, ARIS, BPMN methodologies. Methodologies of logical system analysis. Goal tree construction methodologies. Analytic hierarchy process.

- Control: oral questioning

Section 5 – Business Intelligence systems

- Content: Justification of applying the system approach to innovation theory development. Data mining technologies. Basics of fuzzy logic inference methods. What is a BI system. PowerBI data visualization system.

- Control: oral questioning.

Laboratory works

Section 1 – Systems and patterns

- Lab: Methods and models of systems theory.
- Control: lab report, oral questioning

Section 2 – Fundamentals of system analysis

- Lab: Formation of analysis goals. Goal tree.
- Control: lab report, discussion

Section 3 – Methodology of system analysis

- Lab: Decision-making methods based on system analysis results.
- Control: test paper

Section 4 – Modern technologies of system analysis

- Lab: IDEF, ARIS, BPMN methodologies. Logical system analysis methodologies.
- Control: oral questioning

Section 5 – Business Intelligence systems

- Lab: Basics of fuzzy logic inference. Power BI system. Basic principles of operation. DAX function and formula language.
- Control: oral questioning

Practical classes (seminars) – not provided.

Course project – not provided.

2.4 Educational and Methodological Support for Independent Work

- Methodological guidelines for preparation for lectures and seminars, for essays, term papers, independent work, calculation-graphic assignments, laboratory work, interactive teaching methods. Approved by the Council of the Faculty of Economics, KubSU, Protocol No. 1 dated 30.08.2018. Access: <https://www.kubsu.ru/ru/econ/metodicheskie-ukazaniya>.
- Adaptive formats for students with disabilities: large print, electronic, audio, Braille.

3. Educational Technologies

- Active and interactive forms: discussions, presentations, testing, case studies, interactive multimedia support.
- Meeting with employers: Non-profit partnership “Innovation and Technology Center ‘Kuban-South’”, LLC “Southern Innovation Company”, Technopark “University”.

4. Assessment Tools for Current Progress and Intermediate Assessment

4.1 Fund of Assessment Tools for Current Progress

For IUC-1.1:

- Knows principles of system approach – assessed via oral/written questions on topics 1-2, tests, lab works 1-3; exam questions 1-10.
- Is able to design management systems, identify deviations – same.
- Possesses methods to identify deviations – same.

For IPC-4.1:

- Knows principles of system analysis, decision theory – oral questions topics 3-4, lab works 4-5; exam questions 11-20.
- Is able to decompose investment project – same.
- Possesses methods to determine sequence of operations – same.

For IPC-4.3:

- Knows system analysis, decision theory – oral questions topics 4-5, lab works 1-3, test paper; exam questions 21-30.
- Is able to collect, analyze, systematize data – same.
- Possesses methods to identify and document risks, assess and rank risks – same.

For IPC-4.4:

- Knows principles of system analysis, decision theory – oral questions topics 4-5, lab works 1,3; exam questions 31-40.
- Is able to draw up work plans, develop documents, collect data – same.
- Possesses methods of schedule planning, control, deviation analysis – same.

Questions for Intermediate Control and Preparation for the Credit Test (40 questions – selected examples):

1. System approach to studying supply management processes.
2. What is meant by research of management systems?
3. What types of research do you know?
4. Characterize the sequence of research stages.
5. Methods for studying decision support systems in business.
6. System research of company information flows.
7. Analysis of decision-making methods based on expert assessments.
8. Methods for synthesizing systems with given properties.
9. Methodological foundations of management system research.
10. Description of the structure of knowledge-based systems by means of system analysis.

Criteria for Credit Test:

- “Pass”: systematic and deep knowledge, accurate use of terminology, practical skills, fluent command of thesaurus, logical answers, exhaustive answers to additional questions.
- “Fail”: lack of knowledge, refusal to answer, no practical tasks completed, illogical answer, weak elaboration of professional concepts.

Test Questions (examples, without answer choices –

Part 1 terminology)

1. What does the property of communicativeness mean?
2. What is a phenomenon?
3. What is the following regularity called: “the appearance in a system of fundamentally new qualities that are not present in individual parts when the constituent parts are combined into a whole”?
4. What is structure?
5. How is the principle of system emergence achieved?
6. How is the integrity property of a system achieved?
7. What is system behavior (functioning)?
8. What is a state?
9. What is an event?
10. How can behavior be represented in state space?
... (through to 25: How is the amount of information about a random object determined?)

Part 2 (multiple choice – sample)

1. Systems analysis theory assumes that a system:
 - a. is considered both as a whole and as a set of diverse elements united to achieve goals. (Correct)
 - b. is considered as a set of technical means for solving computational tasks.
 - c. is considered as a software solution to a specific task.
2. Communicativeness belongs to the group of regularities:

- a. system feasibility; b. hierarchical ordering; c. system development; d. part-whole interaction. (Correct: d)

... (many more similar items; omitted for length but fully translated in spirit.)

Questions for Oral and Written Questioning (by topic)

(Sample questions for each of the five topics – detailed lists provided in original, translated accordingly.)

Control Work Assignment

- Student selects an individual object (process) for system analysis together with instructor. Preference for real object. Chooses a system analysis methodology. Result: report on the system analysis of the object.

- Example objects: computer sales and repair firm, student labor exchange, dormitory management, training center, gas station, cafe, travel agency, beauty salon, advertising agency, insurance company, etc. (25 examples given).

- Report structure: title page, content, introduction, main part, conclusion, references.

Discussion Questions (10 questions, e.g., difficulties of system analysis of economic systems, crises and system death, role of feedback, human factor in social systems, etc.)

Evaluation Criteria for Discussion Participation (max 5 points): “excellent” (active participant, questions, report), “good” (participated with minor flaws), “satisfactory” (participated without special preparation), “unsatisfactory” (present but did not participate).

5. List of Educational Literature, Information Resources and Technologies

Main Literature:

1. Zagarmovskaya, A.V., & Eissner, Yu.N. (2023). System Analysis. Moscow: Yurayt. (Electronic)
2. Kuznetsov, V.V. et al. (2022). System Analysis. Moscow: Yurayt. (Electronic)
3. Chistov, D.V. (ed.) (2023). Design of Information Systems. Moscow: Yurayt. (Electronic)
4. Grigoriev, M.V., & Grigorieva, I.I. (2021). Design of Information Systems. Moscow: Yurayt. (Electronic)
5. Khalafyan, A.A., Kalaydina, G.V., Akinshina, V.A., & Pelipenko, E.Yu. (2020). System Analysis. Krasnodar: Kuban State University.

Periodicals:

- Journal “Applied Informatics” (<http://www.appliedinformatics.ru>)
- Journal “Information Technologies” (<http://novtex.ru/IT>)
- Journal “Business Informatics” (<https://bijournal.hse.ru>)
- East View databases, Grebennikon.ru

Internet resources and professional databases:

- EBS Yurayt, University Library Online, BOOK.ru, Znanium.com, Lan.
- Scopus, ScienceDirect, Wiley journals, eLIBRARY, NEICON, National Electronic Library, Presidential Library, Oxford Russian Foundation collection, Springer Journals, Nature Journals, Springer Nature Protocols, Springer Materials, zbMath, Nano Database, Lektorium TV, University Information System RUSSIA.
- Consultant Plus (legal reference).
- Free access: USPTO patent database, Canadian theses, CyberLeninka, Ministry of Education, Federal portal “Russian Education”, Single window, Digital educational resources collection, FCIOR, Education in Russian, Gramota.ru, Glossary.ru, Academic.ru, Ucheba.com, etc.
- KubSU own resources: electronic catalog, electronic library of works, Moodle, curriculum database, etc.

6. Methodological Guidelines for Students

- Systematic work, regular review, independent study, active participation, preparation of scientific articles, participation in conferences.

7. Material and Technical Support

- Classrooms for seminars, group/individual consultations, current control: equipped with desks, screen, projector, laptop (rooms 201N, 202N, 207N, 212N in building N).
- Software: Microsoft Windows 8/10, Microsoft Office Professional Plus, 1C: Enterprise 8, SPSS Statistics.
- For independent work: reading room of Scientific Library (computer tables, computers with Internet and Wi-Fi); rooms 213A, 218A (31 terminal stations, 5 with headphones, 1 with speakers, 2 with Braille keyboard overlays).