MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

Federal State Autonomous Educational Institution of Higher Education "Perm State National Research University"

Department of Information Systems and Mathematical Methods in Economics

PROGRAM

FOR THE STATE FINAL CERTIFICATION FOR THE GRADUATES OF THE BACHELOR DEGREE IN

38.03.05 "Business Informatics"

for correspondence to the requirements of

self-established standard of higher education

Perm 2023

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Program For The State Final Certification for the Graduates of the Bachelor's Degree in 38.03.05 "Business Informatics" for correspondence to the requirements of self-established standard of higher education / co-authors: I.V. Ilyin, V.P.Maximov, M.V.Radionova, N.V.Frolova, D.V. Shimanovsky Perm State National Research University. - Perm, 2023. - 167 p. The program is designed for the students of the Faculty of Economics, studying for the Bachelor's Degree in 38.03.05 "Business Informatics".

Approved by the Academic Council of PSNRU, protocol N_{2} 12 dated 30.08.2023.

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1 General provisions

1.1 The general procedure of the state final certification of educational programs (EP) of higher education is determined by the regulatory and legal sources:

- Federal Law of 29.12.2012 № 273-FZ "On Education in the Russian Federation";

- On approval of the Order of organization and implementation of educational activities under the educational programs of higher education - Bachelor's programs, Specialist's programs, Master's programs, approved by the order of the Ministry of Education and Science on April 5, 2017 No 301;

- On approval of the procedure for conducting the state final attestation for educational programs of higher education - bachelor's programs, specialist's programs and master's programs (as amended on March 27, 2020), approved by Order of the Ministry of Education and Science of the Russian Federation from June 29, 2015, No. 636;

- independently established educational standard for the direction of training 38.03.05 Business informatics;

- Regulations on the Procedure of the State Final Certification for Higher Education Programs - Bachelor's, Specialist's and Master's Degree Programs at PSNRU (hereinafter, Regulations on the Procedure of the PSNRU State Final Certification);

- Charter of the Federal State Autonomous Educational Institution of Higher Education "Perm State National Research University".

- Educational program of higher education in the field of training 38.03.05 Business informatics;

- Curriculum on the direction of training 38.03.05 Business informatics.

1.2 The form of the state final certification - the state exam and the defense of the bachelor's graduate qualification work (GQW).

1.3 The amount of time for the State Final Certification - 324 hours (9 c.u.).

1.4 Students who have no academic debts and who have fully completed the curriculum or individual curriculum for the educational program of higher education are allowed to participate in the procedure of state final certification.

1.5 The purpose and objectives of the state final certification.

The purpose of the State Final Certification (SFC) is to determine the compliance of the results of mastering the educational program of 38.03.05 "Business Informatics" with the relevant requirements of the self-established educational standards (SEES) of higher education of PSNRU.

The state final certification includes a state examination and the defense of the graduate qualification work.

The objectives of the State Final Certification are:

• assess the quality of mastering the educational program in the field of 38.03.05 Business Informatics;

- to evaluate the level of the learner's competences, the degree of mastering theoretical knowledge, skills and practical abilities for professional activities;
- to decide the issue of awarding the student a qualification based on the results of the SFC and issuing the graduate a document of the established form of education and qualification.

2. The list of competencies that students must master as a result of completing the educational program and tested at the state final certification

The list of universal competencies (UC), confirming the graduate's general knowledge and social experience

UC.1. Is able to search, analyze and synthesize information, apply a systematic approach to solve problem situations.

UC.1.1. Searches for information, critically evaluates the reliability of its sources.

UC.1.2 Works with contradictory information from different sources, finds gaps in information necessary for problem solving, identifies options to address the gaps.

UC.1.3 Analyzes the problem situation as a system, identifying its components and connections between them.

UC.2. Is able to determine the range of tasks within the set goal and choose ways to solve them based on available resources and limitations.

UC.2.1. The student is able to formulate tasks within the scope of the goal.

UC.2.2 Evaluates available resources (time, material, etc.) to solve the formulated tasks.

UC.2.3 Justifies the way of problem solving taking into account the available resources and limitations.

UC.3 Is able to participate in the implementation of a group project.

UC.3.1 Solves the tasks of a specific role in teamwork.

UC.3.2 Resolves contradictions and conflicts that arise during teamwork, adjusts team work and reallocates roles taking into account the interests of the parties.

UC.4. Is able to carry out business communication in Russian and foreign languages in oral and written forms.

UC.4.1 Communicates and communicates intelligently and reasonably in written and spoken form in Russian and foreign languages.

UC.4.2. Translate texts from foreign language to Russian and from Russian to foreign language.

UC.4.3. Presents the results of activities at public events orally and in writing.

UC.5. Is able to perceive intercultural diversity of society in socio-historical and philosophical contexts.

UC.5.1 Orientates in the cultural diversity of the modern world in the context of its historical development.

UC.5.2 Understands the historical and cultural uniqueness of his/her country.

UC.5.3 Accepts social, ethical, confessional and cultural differences.

UC. 5.4 Shows in its behavior a respectful attitude to the historical heritage and socio-cultural traditions of various social groups, based on knowledge of the stages of the historical development of Russia in the context of world history and cultural traditions of the world.

UC.5.5 Consciously chooses value orientations and a civic position; reasonably discusses and solves problems of a philosophical, social and personal nature.

UC.6 Is able to manage own resources, build and implement a trajectory of self-development.

UC.6.1 Evaluates own resources (temporal, personal, psychological).

UC.6.2 Manages own resources (time management, stress management, self-presentation).

UC.7. Is able to maintain an appropriate level of physical fitness to ensure full social and professional activities.

UC.7.1 Selects health-saving technologies to maintain a healthy lifestyle, taking into account the physiological characteristics of the body.

UC.7.2 Plans his/her time for an optimal combination of physical and mental activity and performance.

UC.8. is able to create and maintain safe living conditions in everyday life and professional activities to preserve the natural environment, ensure sustainable development of society, including the threat and emergence of emergencies and military conflicts.

UC.8.1 Analyze the factors of harmful effects on the elements of the environment (technical means, technological processes, materials, buildings and structures, natural and social phenomena).

UC 8.2. Identifies hazardous and harmful factors, identifies and eliminates problems related to safety violations within the scope of activity.

UC.8.3 Identifies problems, causes and conditions of emergencies and military conflicts, has methods for predicting emergencies and takes measures to prevent them.

UC.8.4 Explains the rules of conduct in emergencies and military conflicts; provides first aid, describes how to participate in recovery activities.

UC.9 Knows the legal and ethical norms and is able to assess the consequences of violating these norms.

UC.9.1 Orientation in legal principles and norms in different spheres of life activities and consequences of their violation.

UC.9.2 Orient in ethical norms of behavior in different types of professional activity and consequences of their violation.

UC.10. Is able to use basic defectological knowledge in social and professional spheres.

UC.10.1 Take into account psycho-physiological peculiarities of the development of persons with disabilities in the process of social interaction.

UC.10.2 Demonstrates a tolerant attitude to persons with disabilities and persons with disabilities.

UC.10.3 Builds professional interaction with persons with psychophysiological features, taking into account nosology.

UC.11. is able to make sound economic decisions in different areas of life UC.11.1 Considers the basic principles of economic functioning and economic development, goals and forms of state participation in the economy when

making economic decisions.

UC.11.2 Apply methods of personal economic and financial planning to achieve financial goals.

UC.11.3 Uses financial tools to manage personal finances (budget), controls own economic and financial risks.

UC.12. Is able to form intolerant attitude towards corrupt behavior.

UC.12.1 Identifies the main features and regulators of corrupt behavior.

UC.12.2 Uses methods of corruption prevention and the formation of an intolerant attitude towards corrupt behavior in various areas of life.

UC.12.3 Carry out interaction on the basis of an intolerant attitude towards corrupt conduct in social and professional spheres.

UC.13. Is able to form an intolerant attitude to manifestations of extremism, extremism and counteract them in the professional sphere

UC.13.1 Defines the main signs of extremist and terrorist activity

UC.13.2 Identifies information calling for extremist and terrorist activities

UC.13.3 Carries out interaction on the basis of an intolerant attitude to manifestations of extremism and terrorism, has the skills of argumentation of countering extremism and terrorism in professional activities

The list of general professional competencies (GPC), on the basis of which professional competencies (PC) are mastered

GPC.1. Is able to understand the regularities of economic system development and, based on these regularities, propose justified organizational and managerial decisions within his/her professional activities.

GPC.1.1. Understands the regularities of economic system development and is able to explain the reasons for its changes within his/her professional activities.

GBPC.1.2 Have an understanding of the basic principles and methods of functioning and management of economic systems, can name them, and understands the order and cases of their application.

GPC.1.3 Names and comments the main sources and methods of financing, understands the differences between them, and can evaluate and select the necessary ones when solving professional tasks.

GPC.1.4. Understands the content of basic business accounting systems and accounting reporting techniques to perform tasks within his/her professional activities.

GPC.1.5 Evaluates managerial and organizational decision options based on economic efficiency indicators based on available information.

GPC.2. Is able to understand the principles of modern information and communication technologies and use them to solve professional tasks taking into account information security requirements.

GPC.2.1 Demonstrates basic knowledge of information and communication technology.

GPC.2.2. Reasonably selects information and communication technologies and uses them in professional activities, taking into account information security requirements.

GPC.3. Is able to independently conduct research activities in his/her professional area using modern research methods.

GPC.3.1 Sets the goal and objectives and makes a plan for scientific research within his/her professional field.

GPC.3.2 Collects, critically analyzes and processes information using scientific and applied research methods in accordance with the assigned task.

GPC.3.3 Identifies weaknesses and gaps in the economic system within her/his professional area and substantiates proposals to address identified weaknesses and gaps.

GPC.3.4. Formulates and presents the results of his/her scientific and applied research in written and oral forms using information technology.

GPC.4. is able to apply statistical and economic-mathematical methods to process economic information and identify patterns of economic processes.

GPC.4.1 Apply basic methods of mathematical analysis to quantify social and economic processes.

GPC.4.2 Apply methods of summarizing and grouping quantitative information and describing the economic situation using statistical indicators.

GPC.4.3 Identifies and investigates relationships between economic processes and phenomena using mathematical and statistical methods and models.

GPC.5. is able to study various markets of goods (works, services) to perform his/her professional tasks.

GPC.5.1 Names and comments the rules and methods of market research and analysis, understands the regularities of the development of markets for individual goods and services.

GPC.5.2 Names and comments the methods and modern technologies of working with consumers and understands their importance for accomplishing professional tasks.

GPC.6. Is able to apply legal regulations in professional activities.

GPC.6.1 Searches for normative-legal documents in the field of professional activity.

GPC.6.2 Applies legal acts and normative documents in the field of professional activity.

GPC.7. is able to model, analyze, and improve enterprise business processes and information technology infrastructure to achieve its strategic goals using modern methods and software tools.

GPC.7.1 Analyze business processes to achieve strategic goals.

GPC.7.2 Model enterprise business processes using modern methods and software tools to determine the level of achievement of strategic objectives.

GPC.7.3. Analyzes enterprise information technology infrastructure to improve it to achieve the owners' strategic goals.

GPC.8. Is able to manage the creation and use of information and communication technology products and services, including the development of algorithms and programs for their practical implementation.

GPC.8.1. Manages business processes for the creation and use of information and communications technology products and services.

GPC.8.2. Develops algorithms and programs for their practical implementation.

GPC.9. Is able to use information, methods and software tools for information collection, processing, and analysis to provide information and analytical support for managerial decision making.

GPC.9.1. Reasonably uses information for information and analytic support of management decisions.

GPC.9.2. Uses methods and software to collect, process, and analyze information for information and analytic support of management decisions.

GPC.10. Organizes interactions with customers and partners in the process of solving information systems and information and communication technology lifecycle management problems.

GPC.10.1 Organizes interaction with customers and partners in the course of information systems lifecycle management and information and communication technology lifecycle management tasks.

GPC.10.2. Participates in solving information systems and information and communications technology lifecycle management problems.

List of professional competencies

PC.1. Is able to justify decisions.

PC.1.1 Forms possible solutions based on targets developed for them.

PC.1.2 Analyzes, justifies and selects solutions.

PC.2. Is able to analyze, justify and select solutions based on business analysis of information using information technology.

PC.2.1 Identifies, records, analyzes, and documents the results of business analysis in accordance with selected approaches using information technology to the extent necessary for system analysis purposes.

PC.2.2 Identifies relationships and dependencies between elements of business analysis information in accordance with selected approaches using information technology to the extent necessary for system analysis.

PC.2.3 Solves business analysis problems, taking into account strategies, goals, business processes, and information technology structure of the organization, using information technology to the extent necessary for analysis and decision making purposes, including planning and management of information system development.

PC.3. is able to plan and organize analytical work, including the use of big data technologies.

PC 3.1. Develops, discusses and approves the content of analytical work, including the use of big data technologies.

PC 3.2. Determines team composition for data analytics, including big data.

PC 3.3. Determines the necessary resources to conduct analytical work.

PC 3.4. Develops, discusses, and approves a plan for analytical work.

PC 3.5. Allocates roles and composition of analytical work among team members to analyze data, including big data.

PC.4. Is able to perform tactical management of planning and organization of production processes.

PC.4.1 Plans and organizes the execution of typical tactical production management activities.

PC.4.2. Develops analyses and reports to evaluate the performance of the business as a whole and the organization's production units, and implements procedures for recording, analyzing, and controlling the fulfillment of planned tasks.

PC.5. is able to analyze requirements

PC.5.1 Analyzes functional and non-functional requirements for an information system (IS).

PC.5.2 Specifies (documents) the IS requirements.

PC.5.3 Verifies (conducts verification) of IS requirements

2.1 When taking a state exam

Universal competencies:

UC.1. Is able to search, analyze and synthesize information, apply a systematic approach to solve problem situations.

UC.1.1. searches for information, makes a critical assessment of the reliability of its sources.

UC.2. Is able to determine the range of tasks within the set goal and choose the ways of their solution on the basis of available resources and limitations.

UC.2.1 Formulates tasks based on the set goal.

UC.2.2 Evaluates the available resources (time, material, etc.) to solve the formulated tasks.

UC.3 Be able to participate in the implementation of a group project.

UC.3.1 Solves the tasks of the specific role in the teamwork.

UC.3.2 Resolves contradictions and conflicts that arise in the course of team work, adjusts team work and redistributes roles taking into account the interests of the parties.

UC.4. is able to carry out business communication in Russian and foreign languages in oral and written forms.

UC.4.1 Communicates and communicates intelligently and reasonably in written and spoken form in Russian and foreign languages.

UC.4.2 Translate texts from foreign language to Russian and from Russian to foreign language.

UC.5. Is able to perceive intercultural diversity of society in socio-historical and philosophical contexts.

UC.5.1 Orient in the cultural diversity of the modern world in the context of its historical development.

UC.5.2 Understands the historical and cultural uniqueness of his/her country.

UC. 5.4 Shows in its behavior a respectful attitude to the historical heritage and socio-cultural traditions of various social groups, based on knowledge of the stages of the historical development of Russia in the context of world history and cultural traditions of the world.

UC.5.5 Consciously chooses value orientations and a civic position; reasonably discusses and solves problems of a philosophical, social and personal nature.

UC.7. Is able to maintain an adequate level of physical fitness to ensure full social and professional activity.

UC.7.1 Chooses health-saving technologies to maintain a healthy lifestyle, taking into account the physiological characteristics of the body.

UC.7.2 Plans his/her time for an optimal combination of physical and mental activity and performance.

UC.8.1 Create and maintain safe living conditions in everyday life and professional activities to preserve the natural environment, ensure sustainable development of society, including the threat and emergence of emergencies and military conflicts.

UC.8.3 Identifies problems, causes and conditions of emergencies and military conflicts, knows methods of forecasting emergencies and takes measures to prevent them.

UC.11. is able to make sound economic decisions in different areas of life

UC.11.1 Take into account the basic principles of economy and economic development, goals and forms of state participation in the economy when making economic decisions.

UC.11.2 Apply methods of personal economic and financial planning to achieve financial goals.

UC.11.3 Uses financial tools to manage personal finances (budget), controls own economic and financial risks.

UC.12. Is able to form intolerant attitude towards corrupt behavior.

UC.12.2 Uses methods of corruption prevention and formation of an intolerant attitude towards corrupt behavior in various spheres of life.

UC.12.3 Engages in interaction on the basis of a zero-tolerance attitude towards corrupt behavior in social and professional spheres.

General professional competencies:

GPC.1. Is able to understand the regularities of economic system development and, based on them, offer sound organizational and managerial decisions within his/her professional activities. GPC.1.1. Understands the regularities of economic system development and is able to explain the reasons for its changes within his/her professional activities. GPC.1.2. Has an understanding of the basic principles and methods of functioning and management of economic systems, can name them, and understands the order and cases of their application.

GPC.4.4 Is able to apply statistical and economic-mathematical methods to process economic information and identify patterns of economic processes.

GPC.4.1 Applies basic methods of mathematical analysis to quantify social and economic processes.

GPC.4.3 Identifies and investigates relationships between economic processes and phenomena using mathematical and statistical methods and models.

GPC.5. Is able to study various markets of goods (works, services) to perform his/her professional tasks.

GPC.5.1 Identifies and comments on the rules and methods of market research and analysis, understands the regularities of the development of markets for individual goods and services.

GPC.5.2 Names and comments the methods and modern technologies of working with consumers and understands their importance for accomplishing professional tasks.

GPC.6. Is able to apply legal regulations in professional activities.

BPC.6.1 Searches for normative-legal documents in the field of professional activity.

GPC.7. Is able to model, analyze, and improve business processes and information technology infrastructure to achieve strategic goals using modern methods and software tools.

GPC.7.1 Analyze enterprise business processes to achieve its strategic goals.

GPC.7.3. Analyzes enterprise information technology infrastructure to improve it to achieve the owners' strategic goals.

GPC.9. is able to use information, methods and software tools to collect, process, and analyze it for information and analytic support of management decision making.

GPC.9.1 Reasonably uses information for information and analytical support of managerial decision making.

Professional competencies:

PC.1. Is able to justify decisions.

PC.1.1 Forms possible decisions based on the targets developed for them.

PC.1.2 Analyzes, justifies and selects solutions.

PC.3. Is able to plan and organize analytical work, including the use of big data technology.

PC.3.3 Identifies necessary resources for analytical work.

PC.3.4 Develops, discusses and approves the plan for analytical work.

PC.5. Able to analyze requirements.

PC.5.2 Specifies (documents) the IS requirements.

PC 5.3. Verifies (conducts verification) of IS requirements.

2.2 When defending the graduate qualification work

Universal competencies:

UC.1. Is able to search, analyze and synthesize information, apply systematic approach to solve problem situations.

UC.1.2 Works with contradictory information from different sources, finds gaps in information necessary for problem solving, identifies options to eliminate the gaps.

UC.1.3 Analyzes problem situation as a system, identifying its components and connections between them.

UC.2. Is able to determine the range of tasks within the set goal and choose ways to solve them based on available resources and limitations.

UC.2.3 Justifies the way of problem solving taking into account the available resources and constraints.

UC.4.4 Is able to carry out business communication in Russian and foreign languages in oral and written forms.

UC.4.3 Presents the results of activities at public events orally and in writing.

UC.5.5 Is able to perceive intercultural diversity of society in socio-historical and philosophical contexts.

UC.5.3 Perceives social, ethical, confessional and cultural differences.

UC.6 Is able to manage own resources, build and implement a trajectory of self-development.

UC.6.1 Evaluates own resources (temporal, personal, psychological).

UC.6.2 Manage own resources (time management, stress management, self-presentation).

UC.8. is able to create and maintain safe living conditions in everyday life and professional activities to preserve the natural environment, ensure sustainable

development of society, including the threat and emergence of emergencies and military conflicts.

UC.8.1 Analyze the factors of harmful effects on the elements of the living environment (technical equipment, technological processes, materials, buildings and structures, natural and social phenomena).

UC.8.2 Identifies hazardous and harmful factors, identifies and eliminates problems related to safety violations within the scope of the activity.

UC.8.4 Explains rules of conduct in emergencies and military conflicts; provides first aid, describes ways to participate in recovery activities.

UC.9 Knows the legal and ethical norms and is able to assess the consequences of violating these norms.

UC.9.2 Orient in ethical norms of behavior in different types of professional activity and consequences of their violation.

UC.10. Is able to use basic defectological knowledge in social and professional spheres.

UC.10.1 Take into account the psycho-physiological features of development of persons with disabilities and impairments in the process of social interaction.

UC.10.2 Demonstrates a tolerant attitude to persons with disabilities.

UC.10.3 Builds professional interaction with persons with psychophysiological features, taking into account nosology.

UC.12. Is able to form an intolerant attitude towards corrupt behavior.

UC.12.1 Identifies the main features and regulators of corrupt behaviour.

UC.13. Is able to form an intolerant attitude to manifestations of extremism, extremism and counteract them in the professional sphere

UC.13.1 Defines the main signs of extremist and terrorist activity

UC.13.2 Identifies information calling for extremist and terrorist activities

UC.13.3 Carries out interaction on the basis of an intolerant attitude to manifestations of extremism and terrorism, has the skills of argumentation of countering extremism and terrorism in professional activities

The list of general professional competencies, on the basis of which the professional competencies are mastered

GPC.1. Is able to understand the regularities of economic system development and, based on them, propose sound organizational and managerial decisions within his/her professional activities. GPC.1.3. Names and comments the main sources and methods of financing, understands the differences between them, and is able to evaluate and select the necessary ones when solving professional tasks.

GPC.1.4 Understands the content of basic business fact accounting systems and accounting reporting techniques to perform tasks within their professional activities.

GPC. 1.5 Evaluates managerial and organizational decision options based on economic efficiency indicators based on available information.

GPC.2. Is able to understand the principles of modern information and communication technologies and use them to solve professional tasks taking into account information security requirements.

GPC.2.1 Demonstrates basic knowledge of information and communication technology.

GPC.2.2. Reasonably selects information and communication technologies and uses them in professional activities, taking into account information security requirements.

GPC.3. Is able to independently conduct research activities in his/her professional area using modern research methods.

GPC.3.1 Sets the goal and objectives and makes a plan for scientific research within his/her professional field.

GPC.3.2 Collects, critically analyzes and processes information using scientific and applied research methods in accordance with the assigned task.

GPC.3.3 Identifies weaknesses and gaps in the economic system within her/his professional area and substantiates proposals to address identified weaknesses and gaps.

GPC.3.4. Formulates and presents the results of his/her scientific and applied research in written and oral forms using information technology.

GPC.4.4. Is able to apply statistical and economic-mathematical methods to process economic information and identify patterns of economic processes.

GPC.4.2 Apply methods of summarizing and grouping quantitative information and describing the economic situation using statistical indicators.

GPC.6. Applies legal regulations in professional practice.

GPC.6.2 Applies legal acts and normative documents in the field of professional activity.

GPC.7. Is able to model, analyze, and improve business processes and information technology infrastructure to achieve strategic goals using modern methods and software tools.

GPC.7.2 Model enterprise business processes using modern methods and software tools to determine the level of achievement of strategic objectives.

GPC.7.3 Analyze enterprise information technology infrastructure to improve it to achieve the owners' strategic goals.

GPC.8. Is able to manage the creation and use of information and communication technology products and services, including the development of algorithms and programs for their practical implementation.

GPC.8.1. Manages business processes for the creation and use of information and communications technology products and services.

GPC.8.2 Develop algorithms and programs for their practical implementation.

GPC.9. Be able to use information, methods, and software tools to collect, process, and analyze it for information and analytical support for management decision making.

GPC.9.2 Use methods and software tools for information gathering, processing, and analysis to provide information and analytic support for management decision making.

GPC.10. Is able to organize interaction with customers and partners in the process of solving information systems and information and communication technology lifecycle management problems

GPC.10.1 Organizes interactions with customers and partners in the course of information systems and information and communication technology lifecycle management tasks.

GPC.10.2 Participates in solving information systems and informationcommunication technology lifecycle management problems.

List of professional competencies

PC.2. Is able to analyze, justify and select solutions based on business analysis of information using information technology.

PC.2.1 Identifies, records, analyzes, and documents the results of business analysis in accordance with selected approaches using information technology to the extent necessary for system analysis purposes.

PC.2.2 Identifies relationships and dependencies between elements of business analysis information in accordance with selected approaches using information technology to the extent necessary for system analysis.

PC.2.3 Solves business analysis problems, taking into account strategies, goals, business processes, and information technology structure of the organization, using information technology to the extent necessary for analysis and decision making purposes, including planning and management of information system development.

PC.3. is able to plan and organize analytical work, including the use of big data technologies.

PC.3.1 Develops, discusses, and approves the content of analytical work, including the use of big data technologies.

PC.3.2 Determines team composition for data analytics, including big data.

PC.3.5 Allocates roles and composition of analytical work to team members for data analysis, including big data.

PC.4. Is able to perform tactical management of production planning and organization processes.

PC.4.1 Plans and organizes typical tactical production management activities.

PC.4.2. Develops analyses and reports to evaluate the performance of the business as a whole and the organization's production units, and implements procedures for recording, analyzing, and controlling the fulfillment of planned tasks.

PC.5. is able to analyze requirements

PC.5.1 Analyze functional and non-functional requirements for the IS.

3. Program of the state exam

3.1. Requirements for the content of the state exam

Section 1. Optimal decision methods

Question 1: Mathematical programming

Mathematical programming - the study of problems of finding an extremum of a function on some set and the development of methods of solving these problems. Formulation of mathematical programming problems. The extremum of a function. The target function. Limitations. Permissible solution of a problem. An admissible set. Optimal solution.

Classification of mathematical programming problems: conditional and unconditional extremum, classical optimization problems, linear programming, nonlinear programming, convex programming. Examples of economic formulation of problems.

Question 2: Analysis of a function of one variable in the vicinity of a point: increment, derivative, elasticity, marginal values in economics.

A function of one variable. The vicinity of a point. The increment of a function at a point. The derivative of a function. The economic meaning of the derivative. Limit values in economics. The first and second differential. Taylor formula. Elasticity of a function of one variable.

Question 3: Analysis of a function of one variable on an interval: monotonicity and convexity.

Definition of a function of one variable. Linear and nonlinear functions. Examples. The graph of a function. The concept of monotonicity of a function, definitions. Criteria for the monotonicity of a function of one variable. The direction of convexity of a function. Inflection points. Criteria for convexity of a function of one variable.

Question 4: Extremum of a function of one variable. Necessary and sufficient conditions of extremum. The concept of conditional and unconditional extremum.

Definition of an extremum of a function. The concept of conditional and unconditional extremum of a function. Necessary conditions of extremum of a function. Sufficient conditions of extremum of the function by the first and second derivatives. Scheme of investigation of the function to an extremum.

Question 5. Analysis of a function of several variables in the vicinity of a point: increments, partial derivatives, gradient, Hesse matrix.

A function of several variables. Area of definition of a function. The graph of a function of two variables. Total and partial increments of a function. Definition

of the partial derivative of a function of several variables. The directional derivative. The first and second differentials. The gradient of a function. Hesse matrix. Taylor formula for a function of several variables. Geometric interpretation.

Question 6. Analysis of a function of several variables on an interval: convexity of a function of several variables (FSV), criteria of convexity.

The concept of a convex set. Examples of convex sets. Convex functions, concept of direction of convexity of function. Convexity criteria. Sylvester criterion, criterion by eigenvalues of Hesse matrix. Examples.

Question 7. Unconditional extremum of FSV. Necessary and sufficient conditions of extremum of FSV.

Point of maximum (minimum). Critical (stationary) points. Necessary and sufficient conditions of extremum of function of several variables. Sylvester criterion, criterion on eigenvalues of Hesse matrix. Examples.

Question 8: Conditional extremum of FSV (classical mathematical programming problem). Lagrange method. The necessary and sufficient conditions for the extremum of the FSV.

Formulation of the problem on a conditional extremum. Functions of relations. Point of conditional extremum. Direct method of identification of a conditional extremum. Lagrange method: Lagrange function, necessary conditions of conditional extremum. Sufficient conditions of conditional extremum. Extended Hesse matrix. Examples.

Question 9. Linear programming problem. General statement of the problem. Methods for solving linear programming problems: graphical, simplex method.

Formulation of the linear programming problem (LPP). The objective function. A system of restrictions. Examples. A universal method for solving linear programming tasks - the simplex method. The graphical way of solving LPP. The relationship between maximum and minimum solutions to LPP.

Question 10. Duality in Linear Programming.

Duality problem in linear programming. The economic meaning of dual variables and the dual problem. Relation of direct and dual problems, relation of solutions. Theorems of duality.

Section 2. Econometrics and Econometric Modeling

Question 1: General approach to constructing interval statistical estimates of parameters. Interval estimates of normal distribution parameters.

Normal distribution (density, distribution function, distribution parameters). Concept of one-sided and two-sided quantiles. The concept of statistical estimation of distribution parameters. The concept of confidence interval and confidence probability. Confidence intervals for mathematical expectation and variance of normal population.

Question 2: General linear model of observations (GLMO) with classical assumptions (scalar and matrix forms). The method of least squares (MLS) and its geometrical interpretation in the case of GLMO. Gauss-Markov theorem for GLMO.

A type of general linear regression model (writing in scalar and matrix forms). Classical assumptions of GLMO. Application of MNC to estimate the parameters of GLMO. Geometric interpretation of MLS for GLMO. Formulate the Gauss-Markov theorem.

Question 3: Analyze the quality of a multiple linear regression model using coefficient of determination and adjusted coefficient of determination. Information Criteria. Student's test for testing the significance of model parameters and Fisher's test for testing the significance of a model. Application of p-value to test statistical hypotheses.

The concept of statistical hypothesis. Testing the statistical hypothesis of significance of model parameters with Student's test. Testing the statistical hypothesis of model significance with Fisher's test. Application of p-value when testing statistical hypotheses. Indicators of model quality and their properties: coefficient of determination, adjusted coefficient of determination, Schwarz and Akaike information criteria.

Question 4: Formulation of the general linear hypothesis. Substantive examples of linear hypotheses: on the significance of coefficients; on the significance of the regression model as a whole, to test properties of the Cobb-Douglas function, etc. F - statistics for testing the linear hypothesis. Its record in matrix form, as well as using the residual sum of squares or coefficient of determination.

The concept of statistical hypothesis. The concept and formulation of the general linear hypothesis on regression parameters. Give examples of such hypotheses. To know how to formulate hypotheses about significance of parameters and model as a whole by means of general linear hypothesis. To give examples for testing hypotheses about parameters of Cobb-Douglas function. The matrix form of writing the criterion statistics for testing the

general linear hypothesis and its form using the residual sum of squares or coefficient of determination.

Question 5: Possible deviations from the assumptions of the classical OLMS: autocorrelation, heteroscedasticity of different observations; distribution law other than normal. Informal methods of their detection, possible economic reasons for their occurrence.

Classical assumptions of GLMO. Formulate the Gauss-Markov theorem. The concept of autocorrelation and heteroscedasticity. Informal and statistical methods for detecting deviations from classical GLMO assumptions. Statistical criteria of residuals normality detection: Jacques-Bera criterion. What properties of estimates are violated by deviations from classical GLMO assumptions.

Question 6: The nature of the heteroscedasticity problem. Types of heteroscedasticity. Consequences of heteroscedasticity. Ways to identify heteroscedasticity. Methods of overcoming heteroscedasticity.

The concept of false and true heteroscedasticity and the nature of the problem. Types of heteroscedasticity. What properties of estimations are violated by heteroscedasticity. Formal and informal ways of detecting heteroscedasticity. Statistical criteria: Waiya, Spearman, Goldfeld-Kwandt, Park, Glaser, Breusch-Pagan. Methods for overcoming heteroscedasticity: robust standard errors and weighted MLS.

Question 7: The problem of multicollinearity. Complete and partial multicollinearity. Signs of multicollinearity. The variance inflation coefficient VIF. Methods for eliminating multicollinearity.

The concept of multicollinearity. Complete and partial multicollinearity. Signs of multicollinearity - pre-model and post-model. Auxiliary regressions and the variance bloat factor VIF. List methods of eliminating multicollinearity.

Question 8: A linear probabilistic model. Binary choice models: logit analysis and probit analysis. Calculation of marginal effects and estimation of predictive quality of models.

Constrained dependent variables. Binary dependent variables. Give examples. Linear probability model, its type, methods of estimation, and interpretation of parameters. Binary choice models: logit analysis and probit analysis, type of models, estimation methods. Interpretation of the probability that the dependent variable will take a value of 0 or 1. Calculation of marginal effects for logit model and probit model. Indicators of model quality: McFadden coefficient, number of true and false predicted values, error matrix, indicators of sensitivity and specificity, ROC-curve and AUC, Schwartz and Akaike

criteria. Testing hypotheses about the significance of parameters and the model as a whole.

Question 9: Time series. Basic concepts and definitions. Univariate time series models. The concept and structure of time series. Trend and seasonality analysis. Time series smoothing.

The definition of time series, basic elements and types. The basic concepts and definitions. Univariate models of time series. The concept and structure of time series. Stationary and non-stationary time series. The components of nonstationary time series: trend, seasonality, cyclicality, randomness. Types of nonstationary time series models. Decomposition. Smoothing time series by moving average.

Question 10: The concept of stationarity. Weak and strict stationarity. Testing for unit roots. A first-order autoregressive model, testing its stationarity and deriving an autocovariance function under classical assumptions.

The concept of stationarity of a time series. Weak and strict stationarity. Testing for unit roots, Dickey-Fuller criterion, KPSS. Covariance function, correlation function, correlogram. First-order autoregression model, testing its stationarity with a lag operator and deriving the autocovariance function under classical assumptions.

Question 11. Shift (lag) operators. The reversibility of polynomials from a shift operator. The characteristic equation and its roots.

The notion of shift (lag) operator. The reversibility of polynomials from shift operator for autoregressive model, moving average model, and ARMA model. A characteristic equation and its roots. Check for model stationarity with the shift operator. Give examples.

Question 12: ARIMA class models. Stationarity conditions and reversibility conditions for ARMA (p,q) series. Estimation and checking the adequacy of ARIMA models.

The Box-Jenkins approach. The reduction of nonstationary to stationary time series. ARIMA class models: general form and basic concepts. Know stationarity conditions and reversibility conditions for ARMA (p,q) series. Give methods of estimating model parameters and indicators of the adequacy of ARIMA models, statistical check of its residuals on the fulfillment of classical assumptions.

Section 3: Theory of Optimal Control

Question 1: Extreme Problems. A brief historical review with examples of specific extreme problems.

The review should contain a description of the main stages in the development of the theory of extreme problems in chronological order. The most ancient problems - by the example of isoperimetric problems, variants of Didon's problem: strict statement, target functional and constraints. Fermat's theorem: formulation. Tasks of calculus of variations: the problem about the curve of shortest descent, the problem about maximizing monopolist's profits. Problems of optimal control: the speed problem, the problem of maximizing integral consumption.

Question 2. Tasks of classical calculus of variations. The general idea of the method of variations.

The simplest problem of calculus of variations: problem statement, weak local minimum, strong local minimum, absolute minimum. Method of variations, admissible variation. Functional increment, the familiarity of increment as a sufficient condition for extremum. Illustrative examples of the complete solution of the problem for a quadratic functional.

Question 3: Necessary conditions for a weak local minimum in the simplest problem of calculus of variations. Euler equations. Examples.

The idea of the method of variations and its application to the derivation of necessary conditions for local minimum in the form of the Euler equation. The boundary Euler problem. Extremes and admissible extremes. Illustrative examples of complete solutions of a variational problem using the Euler boundary value problem.

Question 4: The Du Bois-Raymond lemma. Application to the derivation of necessary extremum conditions in problems of calculus of variations.

A general scheme for the derivation of the Euler equation and the role of the Dubois-Raymond lemma. The formulation of the Dubois-Raymond lemma and a discussion of its conditions in terms of sufficiency and in terms of necessity.

Question 5: The formulation of the Pontryagin Maximum Principle. The problem of optimum control with free right end of trajectory.

Statement of the problem of optimal control with free right end of trajectory. Control process, admissible control process, optimal control process. Formulation of Pontryagin's maximum principle, Hamilton-Pontryagin function, conjugate boundary value problem of maximum principle. Illustrative example with construction of Hamilton-Pontryagin function and conjugate problem.

Question 6. Application of the Pontryagin's maximum principle to the study of the problem of optimum control of a single-industry economy.

Statement of the problem of optimum control of single-industry economy, functional, sense of phase variable, sense of control action. Variants of the problem taking into account the discount coefficient and the capital intensity coefficient. Moments of switching and finding them. Problem solution and its discussion in terms of economic sense.

Question 7: Sufficient conditions for optimality. Proof of the main theorem.

The formulation of an optimal control problem with mixed constraints with respect to phase and control variables. The basic theorem on sufficient optimality conditions using an analogue of the Hamilton-Pontryagin function. A proof based on the use of an auxiliary functional in the case of an integral functional. The case of a functional with a terminal term. Illustrative examples.

Question 8: A generalized theorem on sufficient optimality conditions.

Sufficient optimality conditions for an optimal control problem in the class of minimizing sequences. Definition of a minimizing sequence. Case of integral functional. Case of a functional with a terminal term. Lack of uniqueness of a solution to a problem in a class of minimizing sequences.

Question 9: Solution of an Optimal Control Problem for a Model of Macroeconomics with a Cobb-Douglas Production Function.

Formulation of the problem of maximization of integral discounted average per capita consumption. The account of restrictions on capital equipment and restrictions on labour productivity. General scheme of problem solution. Argument and its construction. Construction of Initial and Final Integral Funnels. Finding the switching moments.

Question 10. Synthesis of optimum control. The Hamilton-Bellman method.

Two system control schemes, program control, positional control. The problem of optimal control synthesis. The general idea of the Hamilton-Bellman method. The derivation of the Hamilton-Bellman equation using the basic theorem of sufficient optimality conditions. The Hamilton-Bellman boundary value problem. An approximate solution of the Hamilton-Bellman boundary value problem.

Section 4. Mathematical Models of Economics and their Research

Question 1. Production functions.

Axioms (properties). Numerical characteristics: marginal and average products, marginal rate of substitution. Elasticities: output by factors, factor substitution.

Question 2: Consumer behaviour in the market.

Problems of utility maximization and cost minimization, their duality. Marshall and Hicks demand functions.

Question 3. Formulation and derivation of the Slutsky equation.

The economic meaning of Slutsky's equation and its terms. Classification of goods.

Question 4. Web-based models of consumption theory.

Question 5. Continuous models of consumption theory (Walrasian-Evans-Samuelson).

Question 6. Static models of macroeconomics.

Leontief model of inter-industry balance. Productive models (added).

Question 7. Dynamic models of macroeconomics.

The Harrod-Domar model. Analysis of the model for the three main cases: A = 0, A = A(0), $A = A(0) \Box e^{rt}$. Optimal mode of economic development.

Question 8: Solow's model.

Prerequisites of the model. The basic equation of model dynamics in absolute and relative terms. Stationary trajectory and its characteristics.

Question 9. The problem of optimization of specific consumption in the Solow-Swain model. Phelps's "Golden Rule of Accumulation".

Section 5. General issues of information systems and technology

Question 1: Information and information processes. Approaches to measuring information. Principles of information representation (numerical, textual, graphical, etc.) in computing systems.

The concept of information and data. Types of information processes. Alphabetic and content approaches to measuring information. Representation of numerical, textual, graphic information in a PC.

Question 2: Database as an information model of the subject area. The concept of ANSI/SPARC architecture. Types of logical data models. The concept of "DBMS". Architecture models: "File-Server" and "Client-Server".

The concept of database (DB) and DBMS (database management system). ANSI/SPARC architecture. The main logical data models: hierarchical, network, relational. File-server and client-server architecture diagrams.

Question 3. Relational model. The main SQL operators. Index search in the database. Technologies of access to data.

The relational model of data. SQL statements: creation, modification and deletion of tables. Adding, changing and deleting records in tables. Data extraction. Indexes. The main data access technologies: ODBC, ADO.

Question 4: Object-oriented analysis and design. Life cycle models. Database design. ER method of relational database design. Database normalization. CASE tools. Standards for implementing IT projects.

Stages of object-oriented analysis. SOLID principles. Life cycle models. ER diagrams. 1-3 normal forms. The concept of CASE tools. Standards for the implementation of IT projects: SMST 19, 34.

Question 5. programming technologies. Translators. Basic structures of algorithms. Data structures and their processing. OOP mechanisms. Modern tools for fast application development.

The main programming techniques: procedural-oriented programming, objectoriented programming, functional programming, logic programming. Types of translators. Basic structures of algorithms. Data structures and their processing. OOP mechanisms: encapsulation, inheritance and polymorphism. Modern tools for rapid application development.

Question 6. Classical architecture of computer systems (von Neumann principles). Modification of classical architecture principles in modern computers.

Classical architecture of computer systems (von Neumann's principles): composition of basic components of computing machine, principle of binary coding, principle of memory addressing, principle of hierarchical (multilevel) memory organization, principle of stored program, principle of program management. Modification of classical architecture principles in modern computers.

Question 7: The concept of operating systems, their purpose and types. Functions of operating systems. Flows and processes. Mechanism of interruptions as the basis for multitasking of operating systems.

The concept of operating systems, their purpose and types. Operating systems functions (organization of coordinated processes execution and their interaction, multitasking, data exchange with external hardware devices, user interface, memory allocation (operating memory management) and virtual memory organization, applications loading into operating memory and their execution, etc.). The notion of a thread and a process. Mechanism of interruptions as the basis for multitasking of the operating system.

Question 8: Network technologies. The OSI model: general characteristics of the layers. Ethernet as a standard packet-switched technology (general principles of operation). Information security.

Layers of the OSI model: physical, data link, network, transport, session, presentation and application layers. Principles of Ethernet technology operation. Information security: malware, encryption.

Question 9: Enterprise architecture.

Notion of an enterprise. Principles of enterprise organization (functional specialization, reengineering of business processes, corporate architecture). Definition of the architecture of the enterprise. 2 layers of enterprise architecture: business architecture and information systems architecture. Elements of the business architecture of the enterprise (owner's objectives, business processes of the enterprise, organizational structure of the enterprise, resources and data). Models of enterprise architecture description. Architecture analysis.

Question 10: Project analysis.

Project management standards. PMI standard - Project Management Body of Knowledge (PMBOK, Project Management Body of Knowledge). Basic project management concepts: project, project life cycle, project triple constraints, project management processes.

Section 6. Information technologies in economics

Question 1: Basic concepts of economic information systems: MRP, ERP, APS, CSRP, CRM, etc. Corporate information systems.

The concept of information system, its components. The basic concepts of economic information systems: MRP, ERP, APS, CSRP, CRM, etc. The concept of a corporate information system.

Question 2. Concept of data storages. Data warehouse architecture. ETL process. Data warehouses. OLTP class systems. OLAP class systems. Multidimensional cube. Metadata (Meta Data). Master Data, NSI.

The concept of "Data warehouse". Data warehouse architecture. ETL process. Data showcases. OLTP and OLAP class systems. Multidimensional cube. The concept of Meta Data. The concept of Master Data, NSI.

Question 3. Notations and tools for modeling business processes.

The main business process modeling notations: EPC, IDEF0. Decision support systems (DSS). Structure of DSS. History of creating DSS. Structure of DSS. Examples of DSS.

Question 4: Information-analytical systems (IAS). Typical tasks for business analytics. Structure of IAS. Software solutions in business intelligence.

The concept of information-analytical systems. Typical tasks of business intelligence: data collection and storage, monitoring and analysis, modeling and forecasting. The structure of IAS. Software solutions in business analytics.

Question 5. Intelligent data analysis (Data Mining), expert systems.

Statistical and cybernetic methods of Data Mining. The structure of expert systems. Models of knowledge representation.

3.2. List of literature recommended for exam preparation

Section 1. Optimal decision-making methods

Basic literature

1. Goncharov V. A. Optimization methods: textbook for undergraduate and graduate programs / V. A. Goncharov. - Moscow : Publishing house Yurait, 2019. - 191 c. - (Bachelor and Master. Academic course). - ISBN 978-5-9916-3642-1. - Text: electronic // EBS Jurait [website].

2. Zenkov A. V. Methods of optimal solutions: a textbook for academic baccalaureate / A. V. Zenkov. - Moscow: Publishing house Yurait, 2019. - 201 c. - (Bachelor. Academic course). - ISBN 978-5-534-05377-7. - Text: electronic // EBS Yurite [website].

Additional literature

1. Galkina M. Yu. Methods of optimal decisions: educational-methodical manual / M. Yu. Galkina. - Novosibirsk: Siberian State University of Telecommunications and Informatics, 2016. - 89 c. - ISBN 2227-8397. - Text: electronic // Electronic library system IPR BOOKS: [website].

2. Solov'eva S. I. Methods of optimal solutions: a training manual / S. I. Solov'eva, T. T. Balanchuk, L. A. Litvinov. - Novosibirsk: Novosibirsk State Architectural and Construction University (Sibstrin), EBS ASV, 2015. - 173 c. - ISBN 978-5-7795-0717-2. - Text: electronic // Electronic library system IPR BOOKS: [website].

3. Kolemaev V. A. Mathematical methods and models of operations research / V. A. Kolemaev.-Moscow:Publishing house "UNITI-DANA",2012, ISBN 9785238013251.-593.

4. Intriligator M. Mathematical methods of optimization and economic theory:textbook : translation from English / M. Intriligator ; edited by A. A. Konyus ; translated by G. I. Zhukova.-Moscow:Iris-Press,2002, ISBN 5-8112-0042-0.-576.

5. Methods of optimal decisions: a textbook for students of higher education institutions studying in the field of "Economics" (080100), "Management" (080500), "Business Informatics" (080700) : [in 2 vols].-Moscow:FIZMATLIT,2011.Vol. 1. Mathematical Programming/A. V. Sokolov, V. Tokarev. -2011. -563, ISBN 978-5-9221-1257-4. -Bibliography at the end of chapters.

Section 2. Econometrics and Econometric Modeling

Basic literature

1. Econometrics: Textbook / Edited by Prof. V.B. Utkin. - Publishing and Trading Corporation "Dashkov and Co," 2012. - 564 c. - ISBN 978-5-394-

01221-1. - Text: electronic // Electronic library system Bibliotech : [website]. https://psu.bibliotech.ru/Reader/Book/9001

2. Econometrics: textbook for bachelor's and master's degree / I. I. Eliseeva [and others] ; edited by I. I. Eliseeva. - Moscow: Publishing house Yurait, 2019. - 449 c. - (Bachelor and Master. Academic course). - ISBN 978-5-534-00313-0. - Text : electronic // EBS Yurite [website]. https://www.urait.ru/bcode/431129

3. Econometrics for Bachelors : textbook / V. N. Afanasyev, T. V. Leushina, T. V. Lebedeva, A. P. Tsypin ; edited by V. N. Afanasyev. - Orenburg: Orenburg State University, EBS ASV, 2014. - 434 c. - ISBN 2227-8397. - Text: electronic // Electronic library system IPR BOOKS: [website]. http://www.iprbookshop.ru/33668

4. Kondakov, N. S. Econometrika. Part 1: textbook and practical work / N. S. Kondakov. - Moscow: Moscow Humanitarian University, 2015. - 100 c. - ISBN 978-5-906768-73-5. - Text: electronic // Electronic library system IPR BOOKS: [website]. http://www.iprbookshop.ru/50676.html

Additional literature:

1. Econometrics: Textbook / Edited by Prof. V.B. Utkin. - M.: Publishing and Trading Corporation "Dashkov and Co," 2012. - 564 c. - ISBN 978-5-394-01221-1. - Text: electronic // Electronic library system Bibliotech : [website]. https://psu.bibliotech.ru/Reader/Book/9001

2. Econometrics: laboratory practical work / compiled by N. A. Checherova. - 2nd ed. - Komsomolsk-na-Amure, Saratov: Amur Humanitarian-Pedagogical State University, IPR Media, 2019. - 176 c. - ISBN 978-5-4497-0154-1. - Text electronic // IPR BOOKS electronic library system : [website]. http://www.iprbookshop.ru/85837.html

3. Econometrics: workshop / compilers V.A. Molodykh, A.A. Rubezhnoi, A.I. Sosin. - Stavropol: North Caucasus Federal University, 2016. - 157 c. - ISBN 2227-8397. - Text: electronic // Electronic library system IPR BOOKS: [website]. http://www.iprbookshop.ru/66130.html

Section 3. Optimal control theory

1. Maksimov V.P. Theory of optimum control. Introductory course of lectures. Perm, PGNRU. 2018. 83 c.

2. Maksimov V.P., Simonov P.M. Optimal control theory. Tasks and exercises. Perm, PGNRU. 2012. 39 c.

3. Maksimov V.P. Continuous mathematical models. Computer practical work on solving problems of attainability and control. PSNRU. 2019. 123 c.

Section 4. Mathematical models of economics and their research

1. Cheremnykh Y.N. Microeconomics. Advanced level:Tutorial.M.: INFRA-M, 2014. 844 c.

2. Levina E. A. Microeconomics : textbook and practical work for universities / E. A. Levina, E. V. Pokatovich. - Moscow : Publishing house Yurait, 2019. - 673 c. - (Higher education). - ISBN 978-5-534-09724-5. - Text : electronic // EBS Yurite [website]. https://www.urait.ru/bcode/428465

3. Kolemaev V. A. Mathematical economics:textbook for universities / V. A. Kolemaev.-Moscow:UNITI,2002, ISBN 5-238-00464-8.-399.

Section 5: General Information Systems and Technology

The discipline "Informatics"

Basic literature

1. Nikiforov, S. N. Informatics for the first course. Part 1 : tutorial / S. N. Nikiforov. - St. Petersburg State University of Architecture and Civil Engineering, EBS ASV, 2011. - 100 c. - ISBN 2227-8397. - Text : electronic / / electronic library system IPR BOOKS : [website].

2. Nikiforov, S. N. Informatics. Part 2 : tutorial / S. N. Nikiforov. - St. Petersburg : St. Petersburg State Architectural and Construction University, EBS ASV, 2016. - 84 c. - ISBN 978-5-9227-0683-4. - Text : electronic // IPR BOOKS electronic library system : [website].

Additional literature.

1. Nikiforov, S. N. Informatics. Part 3. Applied programming: tutorial / S. N. Nikiforov. - St. Petersburg: St. Petersburg State University of Architecture and Civil Engineering, EBS ASV, 2016. - 128 c. - ISBN 978-5-9227-0743-5. - Text: electronic // Electronic library system IPR BOOKS: [website].

2. Petrov, V. Yu. Informatika. Algorithmization and programming. Part 1: tutorial / V. Petrov. - St. Petersburg: ITMO University, 2016. - 93 c. - ISBN 2227-8397. - Text: electronic // Electronic library system IPR BOOKS: [website].

3. Programming in the high-level language C/C++: Lecture notes/comp. C. P. Zotkin.-Moscow:Moscow State Construction University, IPR Media, EBS ASV, 2016, ISBN 978-5-7264-1285-6.-140.

The discipline "Architecture of the enterprise"

Basic Literature.

1. Zaramenskikh, E. P. Architecture of the enterprise: textbook for undergraduate and graduate programs / E. P. Zaramenskikh, D. V. Kudryavtsev, M. Yu. Arzumanyan; under the editorship of E. P. Zaramenskikh. - Moscow: Publishing house Yurait, 2019. - 410 c. - (Bachelor and Master.

Academic course). - ISBN 978-5-534-06712-5. - Text: electronic // EBS Jurait [website].

2. Rybalchenko M. V. Architecture of information systems: a textbook for universities / M. V. Rybalchenko. - Moscow: Publishing house Yurait, 2019. - 91 c. - (Universities of Russia). - ISBN 978-5-534-01159-3. - Text: electronic // EBS Yurite [website].

Additional literature.

1. Business processes: Regulation and management: Textbook. -Moscow: LLC "Scientific-Publishing Center INFRA-M", 2015, ISBN 9785160018256.

The discipline "Introduction to Project Analysis"

Basic literature

1. Project Management: textbook / E. I. Kutsenko, D. Yu. Viskova, I. N. Korabeinikov [et al]. - Orenburg: Orenburg State University, EBS ASV, 2016. - 269 c. - ISBN 978-5- 7410-1400-4. - Text: electronic // IPR BOOKS electronic library system: [website]. http://www.iprbookshop.ru/61421.html 2. Kandrashina E. A. Financial management: textbook / E. A. Kandrashina. - Moscow: Dashkov and K, IPR Media, 2018. - 220 c. - ISBN 978-5-394-01579-3. - Text: electronic // Electronic library system IPR BOOKS: [website]. http://www.iprbookshop.ru/75192.html

3. Mazur I.I. Project Management: textbook for students studying for the specialty "Organization Management". - 5th ed. revised / I. I. Mazur, V.D. Shapiro, N.D. Olderogge, [et al]. - Moscow: "Omega-L" Publisher, 2009. - 960 c. -(Modern business education). -ISBN 978-5-370- 00538-1. - Text: electronic // Electronic library system Bibliotech: [website]. https://psu.bibliotech.ru/Reader/Book/2641

Additional literature

1. Klaverov, V. B. Project Management. Case of practical training: tutorial / V. B. Klaverov. - Saratov : iP Media, 2018. - 142 c. - ISBN 978-5-4486-0076-0. -Text : electronic // IPR BOOKS electronic library system : [website]. http://www.iprbookshop.ru/69295.html

2. Belyi E. M. Project Management: lecture notes / E. M. Belyi, I. B. Romanova. - Saratov: IPR Media, 2018. - 79 c. - ISBN 978-5-4486-0061-6. - Text : electronic // IPR BOOKS electronic library system : [website]. http://www.iprbookshop.ru/70287.html

3. Ryazantseva L. M. Fundamentals of PROJECT EXPERT software product: tutorial / L. M. Ryazantseva, A. E. Kisova. - Lipetsk: Lipetsk State Technical University, EBS ASV, 2015. - 81 c. - ISBN 978-5-88247-742-3. - Text: electronic // IPR BOOKS electronic library system: [website]. http://www.iprbookshop.ru/57606.html 4. Vorontsovsky A. V. Methods of justification of investment projects in conditions of certainty: tutorial / A. V. Vorontsovsky. - SPb: OCEEM, 2004, ISBN 5-288-02350-6.

Section 6. Information technologies in economics

The discipline "Information Systems in Management"

Basic literature

1. Granichin O. N. Information technologies in management : textbook / O. N. Granichin, V. I. Kiyaev. - 3-th ed. - Moscow, Saratov : Internet University of Information Technology (INTUIT), IPR Media, 2020. - 400 c. - ISBN 978-5-4497-0319-4. - Text : electronic // Electronic library system IPR BOOKS : [website].

2. Granichin, O. N. Information technologies in management : textbook / O. N. Granichin, V. I. Kiyaev. - 3rd ed. - Moscow, Saratov : Internet University of Information Technology (INTUIT), IPR Media, 2020. - 400 c. - ISBN 978-5-4497-0319-4. - Text : electronic // IPR BOOKS electronic library system : [website].

Additional literature

1. Grekul, V. I. Designing information systems : textbook and practice for academic bachelor / V. I. Grekul, N. L. Korovkina, G. A. Levochkina. - Moscow : Publishing house Yurait, 2019. - 385 c. - (Higher education). - ISBN 978-5-9916-8764-5. - Text : electronic // EBS Yurite [website].

3.3 Requirements for the procedure of the state exam

The state exam is of interdisciplinary nature and is held in oral form on the tickets approved by the chairman of SEC (State Examination Commission). Prior to the state examination, consultations are held.

The examination ticket contains three questions, two theoretical and one practical in the form of a case. The answer to the questions of the ticket should provide a statement of definitions, basic concepts and provisions relating to this issue.

The student's level of knowledge is assessed on a four-point scale: "excellent", "good", "satisfactory", "unsatisfactory". After the student completes his answer to the questions on the ticket, the members of the State Examination Commission, with the permission of its chairman, may ask the student additional questions that do not go beyond the program of the state exam. No more than 30 minutes are allowed for the answer to the ticket and questions from the members of the commission.

At the end of the state examination, the commission shall discuss the nature of each student's answers in a closed session and give each examinee a consistent final grade.

The final grade shall be announced to the student on the day of the exam and shall be recorded in the minutes of the exam.

3.4 List of questions for the state exam

Section 1. Optimal decision-making methods

1. Mathematical programming.

2. Analysis of functions of one variable around a point: increment, derivative, elasticity, marginal values in economics

3. Analysis of a function of one variable on an interval: monotonicity and convexity.

4. Extremum of a function of one variable. Necessary and sufficient conditions of extremum. The concept of conditional and unconditional extremum.

5. Analysis of functions of several variables in vicinity of a point: increments, partial derivatives, gradient, Hesse matrix.

6. Analysis of functions of several variables on an interval: convexity of FSV, criteria of convexity.

7. Unconditional extremum of function of several variables (FSV). Necessary and sufficient conditions of extremum of FSV.

8. Conditional extremum of FSV (classical problem of mathematical programming). The Lagrange method. Necessary and sufficient conditions of extremum of FSV.

9. The linear programming problem. The general statement of the problem. Methods for solving linear programming problems: graphical, simplex method. 10. Duality in linear programming.

Section 2. Econometrics and econometric modeling

1. A general approach to the construction of interval statistical estimates of parameters. Interval estimates of parameters of a normal distribution.

2. General Linear Observational Model (GLMO) with classical assumptions (scalar and matrix forms). Least Squares Method (MLS) and its geometrical interpretation in case of GLMO. Gauss-Markov theorem for GLMO.

3. Quality analysis of a multiple linear regression model using coefficient of determination and adjusted coefficient of determination. Information criteria. Student's t test for significance of model parameters and Fisher's test for significance of model. Application of p-value when testing statistical hypotheses.

4. Formulation of the general linear hypothesis. Substantive examples of linear hypotheses: about significance of coefficients; about significance of regression model as a whole, to test properties of Cobb-Douglas function, etc. F - statistics for testing the linear hypothesis. Its record in matrix form, as well as using the residual sum of squares or coefficient of determination.

5. Possible deviations from the assumptions of classical GLMO: autocorrelation, heteroscedasticity of different observations; distribution law

different from normal. Informal methods of their detection, possible economic reasons of occurrence.

6. The nature of the problem of heteroscedasticity. Types of heteroscedasticity. Consequences of heteroscedasticity. Ways to detect heteroscedasticity. Methods for overcoming heteroscedasticity.

7. The problem of multicollinearity. Complete and partial multicollinearity. Signs of multicollinearity. The variance inflation coefficient VIF. Methods to eliminate multicollinearity.

8. Linear probability model. Binary choice models: logit analysis and pro-bit analysis. Calculation of marginal effects and estimation of predictive quality of models.

9. Time series. Basic concepts and definitions. Univariate models of time series. The concept and structure of time series. Trend and seasonality analysis. Smoothing of time series.

10. The concept of stationarity. Weak and strict stationarity. Testing the presence of unit roots. First-order autoregression model, testing for stationarity and derivation of autocovariance function under classical assumptions.

11. Shift (lag) operators. Reversibility of polynomials from a shift operator. The characteristic equation and its roots.

12. Models of the ARIMA class. Stationarity and reversibility conditions for ARMA (p,q) series. Estimation and checking the adequacy of ARIMA models.

Section 3. Optimal control theory.

1. Extreme problems. A brief historical overview with examples of specific extreme problems.

2. Tasks of the classical calculus of variations. The general idea of the method of variations.

3. Necessary conditions for weak local minimum in the simplest problem of calculus of variations. Euler's equations. Examples.

4. The Dubois-Raymond lemma. Application to derivation of necessary conditions of extremum in problems of calculus of variations.

5. Formulation of Pontryagin's maximum principle. Problem of optimal control with free right end of trajectory.

6. Application of Pontryagin's maximum principle to investigation of task of optimal management of one-industry economy.

7. Sufficient conditions of optimality. Proof of the main theorem.

8. Generalized theorem on sufficient optimality conditions.

9. The solution of the problem of optimal control for a model of macroeconomics with a Cobb-Douglas production function.

10. Synthesis of optimal control. The Hamilton-Bellman method.

Section 4. Mathematical models of economics and their study

1. Production functions.

- 2. Consumer behavior in the market.
- 3. Formulation and derivation of the Slutsky equation.
- 4. Spider-web models of consumer theory.
- 5. Continuous models of consumption theory (Walrasian-Evans-Samuelson).
- 6. Static models of macroeconomics.
- 7. Dynamic models of macroeconomics.
- 8. Solow's model.

9. The problem of optimization of specific consumption in the Solow-Swain model. Phelps's "Golden Rule of Accumulation".

Section 5. General issues of information systems and technology

1. Information and information processes. Approaches to measuring information. Principles of information representation (numerical, textual, graphical, etc.) in computing systems.

2. The database as an information model of the subject area. The concept of ANSI/SPARC architecture. Types of logical data models. The concept of "DBMS". Architecture models: "File Server" and "Client Server".

3. Relational model. The main SQL operators. Index search in the database. Data access technologies.

4. Object-oriented analysis and design.

5. Programming technologies. Translators. Basic structures of algorithms. Data structures and their processing. OOP mechanisms. Modern tools for fast application development.

6. Classical architecture of computer systems (von Neumann principles). Modification of classical architecture principles in modern computers.

7. The concept of operating systems, their purpose and types. The functions of operating systems. Flows and processes. Mechanism of interruptions as the basis for multitasking of OS (operating system).

8. Network technologies.

9. Enterprise architecture. Basic concepts and models.

10. Basic concepts of project management. Project management standards.

Section 6. Information technology in economics.

1. Basic concepts of economic information systems: MRP, ERP, APS, CSRP, CRM, etc. Corporate information systems.

- 2. The concept of data warehouses.
- 3. Notations and tools for modeling business processes.
- 4. Decision support systems (DSS). Structure of DSS.
- 5. Information-analytical systems (IAS). Typical tasks of business analytics.
- 6. Intelligent data analysis (Data Mining), expert systems.

4. Funds of assessment tools for the state exam

4.1 Planned learning outcomes for the formation of universal competencies and criteria for their evaluation

Compete ncy codes	Competency name	Learning	Criteria and indic	cators of assessment of lea	arning outcomes and	competence level			
·	Ĩ	outcomes	Insufficient	Threshold	Basic	High			
UC.1. Is ab	UC.1. Is able to search, analyze and synthesize information, apply a systematic approach to solve problem situations								
UC.1.1	Searches for information, makes a critical assessment of the reliability of its sources	To know the methods of searching for information to prepare for the exam; Be able to analyze information from a variety of sources and critically evaluate it; To know how to search for information and analyze it critically	Does not know the technology of searching for information to prepare for the exam; Does not know how to critically evaluate sources of information reliability; Does not know the technologies of information retrieval and cannot make a critical assessment of the reliability of its sources.	Fragmentary knowledge of information retrieval technology; Partially able to critically evaluate sources of information reliability; Partial knowledge of information retrieval technology and partial ability to critically evaluate the reliability of information sources.	Generally knows and understands information retrieval technology; Demonstrates a general ability to critically evaluate sources of information reliability; Is generally proficient in information retrieval technologies and, with minor flaws, is able to critically evaluate the reliability of its sources	information retrieval technology; Demonstrates ability to critically evaluate sources of information reliability; Demonstrates the ability to critically evaluate the reliability of information sources; Fully owns the			

UC.2 Is ab limitations	le to determine the rang	e of tasks within the	set goal and choose	the ways of their solutio	n, based on the avail	able resources and
UC.2.1	Formulates tasks based on the set goal	To know the basic principles of goal- setting, principles of setting tasks depending on the goal in the questions of the state exam; To be able to determine the tasks, based on the questions on the exam; To be able to justify the selected ways of answering the questions of the exam, based on their formulation	Does not know the basic principles of goal-setting, the principles of setting objectives depending on the goal in the answer to the questions; No skills and no abilities.	Not confidently knows the basic principles of goal-setting, the principles of setting tasks depending on the goal within the set questions; Partially knows the basic principles of goal- setting, principles of goal-setting depending on the set questions; Partially knows how to define the tasks based on the set questions of the SAC, purpose and relevance; Partially knows the skills to justify the selected ways of problem solving, based on the set goal.	In general, with some gaps knows the basic principles of goal-setting, the principles of setting tasks depending on the purpose within the questions of the state exam; In general, is able to define tasks, based on the questions of the SEC, the purpose and relevance. In general, with a few gaps, has the skills to justify the selected ways to solve the problems formulated in the SEC tickets, based on the set goal.	define tasks based on the SEC questions, purpose and relevance is formed; High level of skills to justify the selected ways to solve the problems formulated in the SEC tickets, based
UC.2.2	Evaluates the available resources (time, material, etc.) to solve the tasks formulated	Know the methods and techniques and be able to use them to assess the resources (time, material, etc.) available to	Does not know the ways, methods and does not know how to apply them in order to assess the available resources (time, material,	Partial knowledge of methods and techniques and fragmented ability to apply them to assess the available resources (time, material, etc.) to perform the tasks of the	In general, with some gaps, knows the methods, techniques and is able to apply them to assess the available resources	knowingthemethodsandtechniquesand

perform the tasksetc.) to perform theSEC.(time, material,of the SEC;tasks of the SEC;Partially knows theetc.) to perform the	(time, material,
for the SEC tasks of the SEC Partially knows the letc) to perform the	
	etc.) to perform
To be able to No skills and no ways, methods, tasks of the SEC.	the tasks of the
assess the available abilities. methods, etc. and is In general, with	SEC.
resources (time, able to apply them in some gaps, is able	Successfully
material, etc.) order to assess the to assess the	owns the ability to
necessary to solve available resources resources (time,	assess the
SEC tasks. (time, material, etc.) for material, etc.) to	resources (time,
Have the ability to successful fulfillment of successfully	material, etc.) to
assess the the tasks of the SEC. perform the tasks	fully perform the
resources (time, of the SEC.	tasks of the SEC.
material, etc.) to	The ability to
successfully	assess resources
perform the tasks	(time, material,
of the SEC; Know	etc.) for successful
how to assess the	completion of
resources available	SEC tasks is well
(time, material,	developed.
etc.) to perform the	-
tasks of the SEC.	
UC.3 Able to participate in a group project	
UC.3.1 Solves the tasks of a To know the Does not know the Partially knows how Not confident	Is confident in
specific role in solution of the solution of the to solve the main enough knows	solving the main
teamwork main tasks in main tasks in tasks in preparation how to solve the	tasks in
preparation for preparation for the for the SEC in main tasks in	preparation for the
the SEC in SEC in accordance accordance with the preparation for	SEC in accordance
accordance with with the specific specific activities the SEC in	with the specific
the specific activities carried within the framework accordance with	activities carried
activities within out as part of of teamwork. the specific	out within the
the framework of teamwork. No Not confident in activities carried	framework of
teamwork. skills and no solving the main out as part of	teamwork.
To be able toabilities.tasks in preparationteamwork.	Fully knows how
solve the main for the SEC in Not confident	to solve the main

		tasks in preparation for the SEC in accordance with the specific activities within the framework of teamwork. To be able to solve problems in preparation for the SEC in accordance with the specific activities within the framework of teamwork.		accordance with the specific activities within the framework of teamwork; Partially has the ability to solve problems in preparation for the SEC in accordance with the specific activities within the framework of teamwork.	enough knows how to solve the main tasks in preparation for the SEC in accordance with the specific activities within the framework of teamwork; In general, with some gaps, has the ability to solve the tasks in preparation for the SEC in accordance with the specific activities within the framework of teamwork.	tasks in preparation for the SEC in accordance with the specific activities within the framework of teamwork; In general, with some gaps, is able to solve the tasks in preparation for the SEC in accordance with the specific activities within the framework of teamwork.
UC.3.2	Resolves contradictions and conflicts that arise during teamwork, adjusts teamwork, and reallocates roles based on the interests of the parties	Knows the basic methods of project team management to resolve contradictions and conflicts, principles and methods of teamwork; Is able to distribute roles in the team,	Does not know the basic methods of project team management to resolve contradictions and conflicts, principles and methods of teamwork; Does not know how to allocate roles in the team, solve the tasks of a	Partially knows the basic methods of project team management to resolve contradictions and conflicts, principles and methods of teamwork; Satisfactorily knows how to distribute roles in the team, solve the tasks	Insufficiently confidently knows the main methods of project team management to resolve contradictions and conflicts, principles and methods of teamwork; Generally at a	Confident knowledge of the main methods of project team management, principles and methods of teamwork; Strong ability to allocate roles in the team, solve the tasks of a particular role in

		solve the tasks provided by the specific role in the team work; Knows the skills of teamwork to perform the tasks set in the preparation and answers to the questions of the SEC.	particular role in teamwork; No skills.	provided by the specific role in the team work; Fragmentarily knows the skills of teamwork to perform the tasks set in preparation for the SEC.	good level is able to allocate roles in the team, solve the tasks provided by the specific role in the team work; Generally good command of teamwork skills to perform the tasks assigned in preparation for the SEC	the team work; High level of proficiency in teamwork skills to perform the tasks set in preparation for the SEC
UC.4 Is abl	le to carry out business co	ommunication in Rus	sian and a foreign la	nguage in oral and writte	n forms	
UC.4.1	Conducts business communication, intelligently and reasonably constructs oral and written speech in Russian and a foreign language	To know, understand, be able to write down mathematical symbols and terms for their competent and reasoned interpretation in oral and written form in Russian and foreign languages while answering the questions of the examination ticket, to be able, if necessary, having communication	Does not know, cannot write down mathematical symbols and terms for competent and reasoned interpretation of them orally and in writing in Russian and in a foreign language while answering questions on the ticket. No skills and no abilities.	Fragmentary knowledge and understanding of mathematical symbols and terms, definitions, partially able to write them down for competent and reasoned interpretation in oral and written form in Russian and foreign languages, while answering questions on the ticket, partially able, if necessary, having communication skills, to explain them in Russian and foreign	As a whole knows and understands mathematical symbols and terms, demonstrates a generally formed ability to interpret them correctly and reasonably in oral and written form in Russian and foreign languages while answering the questions on the ticket; in general, with minor deficiencies if necessary, knowing	knowing and understanding, shows the ability to write down mathematical symbols and terms to interpret them competently and reasonably in oral and written form in Russian and foreign languages while answering questions on the ticket; confidently, if necessary,

		skills, to explain		languages while	the communication	communication
		them in Russian		answering additional	skills, is able to	skills, able to
		while answering		questions.	explain them in	explain them in
		additional		-	Russian and	Russian and
		questions.			foreign languages	foreign languages
		1			while answering	while answering
					additional	additional
					questions	questions.
UC.4.2	Translates texts from	To know the	Does not know, is	Fragmentary	In general, at a	In general, at a
	foreign language into	methods, rules of	not able to apply	knowledge of the	good level knows	high level knows
	Russian and from	translation of texts	the technique of	methods and rules of	the methods, rules	the methods, rules
	Russian into foreign	from a foreign	translation of texts	translation of texts from	of translation of	of translation of
	language	language into	from foreign	a foreign language into	texts from a foreign	texts from a
		Russian and vice	language to	Russian and vice versa,	language into	foreign language
		versa, necessary to	Russian and from	necessary to prepare an	Russian and vice	into Russian and
		prepare an answer	Russian to foreign	answer to the SEC, to	versa, necessary to	vice versa,
		to the SEC, and	language.	prepare a report,	prepare an answer	necessary to
		answers to	Cannot translate	presentation and	to the SEC, to	prepare an answer
		additional	professional	answers to additional	prepare a report,	to the SEC, to
		questions.	vocabulary from	questions.	presentation and	prepare a report,
		To be able to show	Russian into a	Partially able to show	answers to	presentation and
		knowledge of	foreign language	knowledge of foreign	additional	answers to
		foreign literature	and vice versa from	literature on the subject	questions.	additional
		on the topic while	foreign into	of the thesis while	In general, she is	questions.
		preparing and	Russian.	preparing an answer to	able to show	The student is
		answering SEC		the SEC; translating	knowledge of	fully able to show
		questions; translate		texts from foreign	foreign literature	knowledge of
		texts from foreign		language into Russian,	on the subject of	foreign literature
		language into		and satisfactorily able	the thesis while	on the topic of
		Russian, and be		to translate the text	preparing the	his/her GQW
		able to translate the		from Russian into a	answer to the SEC;	while preparing an
		text from Russian		foreign language.	translating texts	answer to the
		into a foreign		Partially knows how to	from foreign	SEC; while
		language. To be		communicate with the	language into	translating texts

able to members of SEC on the Russian, and	in from foreign
	in nom förergn
communicate with topic of the ticket using general she	can language into
the members of the professional translate the t	text Russian, he/she
GEC on the topic terminology, translating from Russian i	into can translate a text
of the ticket, using necessary texts (words) foreign langu	age from Russian into
professional from a foreign language with a few remain	rks. a foreign
terminology, into Russian and vice A good level	of language. High
translating texts versa. communication	level of
from a foreign skills with	the communication
language into members of	the skills with the
Russian and vice SEC on the topic	c of members of the
	sing SEC on the topic
professional	of the ticket using
terminology,	professional
translating	terminology,
	exts translating
(words) from	Ũ
foreign langu	
into Russian	e · · ·
vice versa.	into Russian and
	vice versa.
UC.5 Able to perceive the intercultural diversity of society in socio-historical and philosophical contexts	
UC.5.1 Orientates in the Shows knowledge Does not show Partially shows the In general sho	ows Fully demonstrates
cultural diversity of the of the main stages knowledge of the knowledge of the main the knowledge	of the knowledge of
modern world in the of development main stages of stages of development the main stages	of the main stages of
context of its historical (history of development (history of development	development
development development) of (history of development) of (history	of (history of
optimization and development) of optimization and development)	of development) of
	and optimization and
preparing for the extreme tasks while preparing for the state extreme proble	1
state exam and preparing for the exam and passing it. while preparing	
passing it. state exam and Partially able to orient the state exam	
Is able to orient in passing it. in the stages of passing it.	and passing it.

		-				
		the stages of	Does not know	development (in the	In general, with	Fully able to orient
		development (in	how to navigate the	context of historical	some inaccuracies,	in the stages of
		the context of	stages of	development) of	is able to orient in	development (in
		historical	development (in	sections of mathematics	the stages of	the context of
		development) of	the context of	(extreme and	development (in	historical
		sections of	historical	optimization problems)	the context of	development) of
		mathematics	development) of	in chronological order	historical	sections of
		(extreme and	sections of	and taking into account	development) of	mathematics
		optimization	mathematics	the existing at this stage	sections of	(extreme and
		problems) in	(extreme and	of the system of	mathematics	optimization
		chronological order	optimization	knowledge in the world	(extreme and	problems) in
		and taking into	problems) in	(cultural diversity).	optimization	chronological
		account the	chronological order		problems) in	order and taking
		existing at this	and taking into		chronological order	into account the
		stage of the system	account the		and taking into	existing at this
		of knowledge in	existing at this		account the	stage of the system
		the world (cultural	stage of the system		existing at this	of knowledge in
		diversity).	of knowledge in the		stage of the system	the world (cultural
		•	world (cultural		of knowledge in the	diversity)
			diversity).		world (cultural	• *
			• /		diversity).	
UC.5.2	Understands the	Shows knowledge	Does not know	Not confidently knows	Not confident	Fully demonstrates
	historical and cultural	of the historical	about the historical	about the historical and	enough knowledge	the knowledge of
	uniqueness of his	and cultural	and cultural	cultural uniqueness of	about the historical	the historical and
	country	uniqueness of	originality of their	their country in the	and cultural	cultural
	5	his/her country in	country in the	context of answering	uniqueness of their	uniqueness of
		the context of	context of the	the questions on the	country in the	his/her country in
		answering the	answers to the	ticket and additional	context of	the context of
		questions on the	questions on the	questions.	answering the	answering the
		ticket and	ticket and	Partially formed ability	questions on the	questions on the
		additional	additional	to critically evaluate	ticket and	ticket and
		questions.	questions. No	and generalize new	additional	additional
		Can show an	abilities, no skills.	knowledge taking into	questions.	questions.
		understanding of		account the historical	In general, the	The ability to
		anacistantaning of		account the motorieur	in general, the	the addition to

		the historical and		and cultural uniqueness	ability to critically	critically evaluate
		cultural uniqueness		of their country.	evaluate and	and summarize
		of his/her country		2	generalize new	new knowledge,
		while answering			knowledge with	taking into
		the questions.			regard to the	account the
		1			historical and	historical and
					cultural	cultural
					peculiarities of	peculiarities of
					their country is	their country is
					formed.	formed.
UC. 5.4	Shows in his behavior a	Recognizes the	Neglects the merits	He is aware of the	He is aware of the	He is aware of the
	respectful attitude to the	merits of the	of Russia's	merits of Russia's	merits of Russia's	merits of the
	historical heritage and	historical heritage	historical heritage	historical heritage and	historical heritage	historical heritage
	socio-cultural traditions	and socio-cultural	and socio-cultural	socio-cultural	and socio-cultural	and socio-cultural
	of various social	traditions of	traditions, speaks	traditions, knows the	traditions,	traditions of
	groups, based on	Russia,	with irony, sarcasm	main stages of the	generally	Russia,
	knowledge of the stages	understands the	and disparagement	country's historical	understands the	comprehensively
	of the historical	reasons for events	of Russia's	development, speaks	reasons for events	understands the
	development of Russia	and decisions in the	achievements in the	without irony, sarcasm	and decisions in the	causes of events
	in the context of world	course of the	context of world	and humiliation about	course of the	and decisions in
	history and cultural	historical	history and cultural	Russia's achievements	country's historical	the course of the
	traditions of the world	development of the	traditions of the	in the context of world	development,	historical
		country, speaks	world	history and cultural	speaks without	development of
		<mark>about Russia's</mark>		traditions of the world	<mark>irony, sarcasm and</mark>	the country,
		<mark>achievements in</mark>			humiliation about	<mark>speaks without</mark>
		<mark>the context of</mark>			Russia's	<mark>irony, sarcasm and</mark>
		world history and			achievements in the	<mark>humiliation about</mark>
		cultural traditions			<mark>context of world</mark>	<mark>the achievements</mark>
		<mark>of the world,</mark>			history and cultural	of Russia in the
		expresses and			traditions of the	<mark>context of world</mark>
		<mark>shows readiness to</mark>			world	<mark>history and</mark>
		follow and develop				cultural traditions
		the traditions of				of the world,
		<mark>Russia</mark>				expresses and

UC. 5.5	Consciously chooses value orientations and a civic position; argumentatively discusses and solves problems of a philosophical, social and personal nature	Adheres to universal moral and moral values in his behavior, does not allow substitution and manipulation in their interpretation, understands and justifies the boundaries of value orientations	Rejects universal moral and moral values, ignores them in his behavior, uses and promotes substitution and manipulation of value concepts in their interpretation, does not observe the boundaries of value orientations	He knows universal moral and moral values in his behavior, tries not to distort their meaning or refrains from interpretation, knows the boundaries of value orientations, in general, follows them in personal and professional activities	Adheres to universal moral and moral values in his behavior, does not allow substitution and manipulation in their interpretation, in general, understands the boundaries of value orientations, follows them in	shows readiness to followand developfollowand developdevelopthe traditionstraditionsofRussiaAdheresto universaland moral moraland moral valuesin his behavior, doesdoesnot allowsubstitutionand manipulationtheir interpretation, understandsand justifiesunderstandsand poundariesboundariesof value
			professional activities		professional activities	account different positions, situations and cultural differences, follows them in personal and professional activities
UC.7 Is abl	e to maintain an appropr	iate level of physical	fitness to ensure full	social and professional a	ctivities	
UC.7.1	Chooses health-saving technologies to maintain a healthy lifestyle, taking into	To know the main ways to maintain a healthy lifestyle, to understand the	Does not know the basic ways to maintain a healthy lifestyle, does not	Shows general, but unstructured knowledge of the main ways to maintain a healthy	Shows the formed, but with some gaps knowledge of the main ways to	Shows the formed, systematic knowledge of the main ways to

	account	the	impact of	this	understand the	lifestyle, partially	maintain a healthy	maintain a healthy
	physiological	uic	factor	on	impact of this	understands the	lifestyle, in general,	lifestyle, fully
	characteristics of	the	professional	on	factor on	influence of this factor	with some gaps	understands the
	body	the	activity;		professional	on professional activity;	understands the	impact of this
	body		To be able to	annly	activity;	Episodically knows	impact of this	factor on
			health-saving	11.	Does not know	how to apply health-	factor on	professional
			technologies	to	how to apply	saving technologies to	professional	activity;
			maintain a h		health-saving	maintain a healthy	activity;	Formed the ability
			lifestyle, inc	•	technologies to	lifestyle, including	At a good level is	to apply health-
			during	the	maintain a healthy	during the preparation	able to apply	saving
			preparation	and	lifestyle, including	and passing the state	health-saving	technologies to
			passing the		during the	exam;	technologies to	maintain a healthy
			exam;		preparation and	Fragmentarily applies	maintain a healthy	lifestyle,
			Systematicall	V	passing the state	skills of health-saving	lifestyle, including	including, during
			apply skill	•	exam;	technologies to	during the	the preparation
			health-saving		Systematically does	maintain a healthy	preparation and	and passing of the
			technologies	to	not apply skills of	lifestyle, taking into	passing the state	state exam;
			maintain a h	ealthy	health-saving	account the	exam;	Successfully
			lifestyle,	taking	technologies to	physiological	Overall	systematically
			into accoun	t the	maintain a healthy	characteristics of the	successfully, but	applies the skills
			physiological		lifestyle, taking	organism.	with some gaps	of health-saving
			characteristic	s of	into account the		applies the skills of	technologies to
			the body.		physiological		health-saving	maintain a healthy
					characteristics of		technologies to	lifestyle, taking
					the body.		maintain a healthy	into account the
							lifestyle, taking	physiological
							into account the	characteristics of
							physiological	the body.
							characteristics of	
							the body.	
UC.7.2	Plans his time for		To know	the	Does not know the	Partially knows the	Shows a formed,	Shows a formed,
	optimal combination		technology	of	0,	technology of planning	but contains some	at a high level of
	1 2	nental	planning thei		planning their time	their time to prepare	gaps knowledge of	knowledge of
	load and en	nsure	to prepare an	d pass	to prepare and pass	and pass the state exam	technology for	technology

performance	the state exam with	the state exam with	with the condition of	planning their time	planning their time
r	the condition of the	the condition of the	the optimal	to prepare and pass	to prepare and
	optimal	optimal	combination of physical	the state exam with	pass the state
	combination of	combination of	and mental load and	the condition of the	exam under the
	physical and	physical and	ensure efficiency;	optimal	condition of an
	mental load and to	mental load and	Fragmentarily able to	combination of	optimal
	ensure efficiency;	ensure efficiency;	apply the technology of	physical and	combination of
	To be able to apply	Does not know	planning their time for	mental load and	physical and
	technologies for	how to apply the	the preparation and	ensure efficiency;	mental load and
	planning their time	technology of	delivery of the state	In general, with	ensure efficiency;
	to prepare and pass	planning their time	exam with the condition	some gaps, is able	Fully able to apply
	the state exam	for the preparation	of the optimal	to apply the	the technology of
	under the condition	and delivery of the	combination of physical	technology of	planning their time
	of the optimal	state exam with the	and mental load and	planning their time	for the preparation
	combination of	condition of the	ensure efficiency;	for the preparation	and delivery of the
	physical and	optimal	General, but	and delivery of the	state exam with
	mental load and	combination of	unstructured mastery of	state exam with the	the condition of
	ensure efficiency;	physical and	the ability to apply the	condition of the	the optimal
	To be able to apply	mental load and	technology of planning	optimal	combination of
	technology	ensure efficiency;	their time for the	combination of	physical and
	planning their time	Does not know the	preparation and	physical and	mental load and
	for the preparation	ability to apply	delivery of the state	mental load and	ensure efficiency;
	and delivery of the	technology	exam with the condition	ensure efficiency;	Formed an overall
	state exam under	planning their time	of the optimal	Generally	structured with the
	the condition of the	to prepare and pass	combination of physical	structured, with	ability to apply
	optimal	the state exam	and mental workload	some gaps, the	technology
	combination of	under the condition	and performance	ability to apply	planning their time
	physical and	of the optimal	capacity is formed;	time planning	to prepare and
	mental stress and	combination of		techniques to	pass the state
	the provision of	physical and		prepare for and	exam under the
	efficiency	mental load and		take the state exam	condition of the
		ensure efficiency;		with the condition	optimal
				of the optimal	combination of
				combination of	physical and

					physical and mental load and ensure efficiency has been formed;	mental stress and ensure efficiency.
	ble to create and maintain tainable development of s	6		-	-	l environment,
UC.8.3	Identifies problems, causes and conditions of emergencies and military conflicts, owns methods of forecasting emergencies and takes measures to prevent them	Knows the basic methods of identifying problems, causes and conditions of emergencies and military conflicts and learns the methods of forecasting during the preparation for the state exam. Is able to search for professionally oriented information and data to identify problems, causes and conditions of emergencies and military conflicts during the preparation for the SEC and to predict the occurrence of amergencies:	basic methods of identifying problems, causes and conditions of emergencies and military conflicts and does not study the methods of forecasting during the preparation for the state exam. Does not know how to seek professionally oriented information and data to identify problems, causes and conditions of emergencies and military conflicts during the preparation for the SEC and predict	Partially knows the basic methods of identifying problems, causes and conditions of emergencies and military conflicts and partially learns the methods of forecasting during the preparation for the state exam. Fragmentarily able to seek professionally oriented information and data to identify problems, causes and conditions of emergencies and military conflicts during the preparation for the SEC and predict the occurrence of emergencies; Partially knows how to use emergency forecasting to take	In general knows the basic methods of identifying problems, causes and conditions of emergencies and military conflicts and sufficiently learns the methods of forecasting during the preparation for the state examination. At a good level is able to search for professionally oriented information and data to identify problems, causes and conditions of emergencies and military conflicts during the preparation for the SEC and predict	Fully knows the basic methods of identifying problems, causes and conditions of emergencies and military conflicts and sufficiently learns the methods of forecasting during the preparation for the state examination. Shows formed, at a high level the ability to seek professionally oriented information and data to identify problems, causes and conditions of emergencies and military conflicts during the
		emergencies; Know how to use	the occurrence of emergencies;	measures to prevent emergencies	SEC and predict the occurrence of	preparation for the SEC and to predict

			D		•	
		emergency	Does not know		emergencies;	the occurrence of
		forecasting to take	how to use the		Has a general	emergencies;
		measures to	forecasting of		structured, with	A full, structured
		prevent	emergencies to take		some gaps,	mastery of
		emergencies	measures to		knowledge of how	techniques for
			prevent them		to use emergency	using emergency
					forecasting to take	forecasting to take
					measures to	preventive
					prevent	measures is
					emergencies	formed
UC.11. Is a	ble to make sound econor	mic decisions in vario	ous areas of life			
UC.11.1	Considers the basic	To know the basic	Does not know the	Partially knows the	In general knows	Fully knows the
	principles of economic	principles of	basic principles of	basic principles of the	the basic principles	basic principles of
	functioning and	functioning of the	the functioning of	functioning of the	of the functioning	functioning of the
	economic development,	economy and	the economy and	economy and economic	of the economy and	economy and
	goals and forms of state	economic	economic	development, the goals	economic	economic
	participation in the	development, the	development, the	and forms of state	development, the	development, the
	economy when making	goals and forms of	goals and forms of	participation in the	goals and forms of	goals and forms of
	economic decisions	state participation	state participation	economy in making	state participation	state participation
		in the economy in	in the economy in	economic decisions in	in the economy in	in the economy in
		making economic	making economic	preparation for and	making economic	making economic
		decisions when	decisions in	taking the state exam	decisions in	decisions in
		preparing and	preparing and	Partially able to apply	preparation for and	preparation for
		passing the state	passing the state	the basic principles of	passing the state	and passing the
		exam;	exam	economy and economic	exam	state exam
		Be able to apply	Unable to apply the	development, the goals	Sufficiently able to	At a high level is
		the basic principles	basic principles of	and forms of state	apply the basic	able to apply the
		of the economy and	the economy and	participation in the	principles of	basic principles of
		economic	economic	economy in making	economy and	the economy and
		development, the	development, the	economic decisions	economic	economic
		goals and forms of	goals and forms of	when preparing, taking	development, goals	development,
		state participation	state participation	and answering the	and forms of state	goals and forms of
		in the economy in	in the economy in	additional questions of	participation in the	state participation
I		In the ceonomy in	In the contonly III	additional questions of	participation in the	suite participation

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		making economic	making economic	the state exam	economy in making	
		decisions when	decisions when	Partially has the ability	economic decisions	U
		preparing, taking	preparing, taking	to apply the basic	when preparing,	decisions when
		and answering	and answering the	principles of economic	taking and	preparing, taking
		additional	additional	functioning and	answering the	and answering the
		questions of the	questions of the	economic development,	additional	additional
		state exam	state exam	goals and forms of state	questions of the	questions of the
		To be able to apply	Unable to apply the	participation in the	state exam	state exam
		the basic principles	basic principles of	economy in making	Good level of	High level of
		of economic	the economy and	economic decisions in	proficiency ability	proficiency is able
		functioning and	economic	preparation for,	to apply the basic	to apply the basic
		economic	development, the	delivery and answering	principles of the	principles of
		development, goals	goals and forms of		economy and	economic
		and forms of	state participation	of the state exam	economic	functioning and
		government	in the economy in		development, goals	economic
		participation in the	making economic		and forms of	development,
		economy in	decisions in		government	goals and forms of
		making economic	preparation,		participation in the	0
		decisions in	delivery and		economy in making	in the economy in
		preparation,	answering		economic decisions	•
		delivery and	additional		in preparation,	decisions when
		answering	questions of the		delivery and	preparing, taking
		additional	state exam		answering	and answering
		questions of the			additional	additional
		state exam			questions of the	questions of the
					state exam	state exam
UC.11.2	Applies personal	Know the methods	Does not know the	Partially knows the	At a good level	At a high level
0.0.11.2	economic and financial	of personal	methods of	methods of personal	knows the methods	-
	planning techniques to	economic and	personal economic	economic and financial	of personal	methods of
	achieve financial goals	financial planning;	and financial	planning;	economic and	personal economic
	active to interioral goald	To be able to apply	planning;	Partially knows how to	financial planning;	and financial
		methods of	Does not know	apply methods of	At a good level is	planning;
		personal economic	how to apply	personal economic and	0	1 0,
		personal economic	now to appry	personal economic and	able to apply	At a migh level 18

	and financial planning when	methods of personal economic	financial planning when preparing, taking and	methods of personal economic	able to apply methods of
	preparing, taking and answering	and financial planning when	answering additional questions of the state	and financial planning when	personal economic and financial
	additional	preparing, taking	exam	preparing, taking	planning in
	questions of the	and answering	Fragmentary knows	and answering	preparation, taking
	state exam Know how to	additional questions of the	how to achieve financial goals,	additional questions of the	and answering additional
	achieve financial	state exam	applying methods of	state exam	questions of the
	goals by applying	Does not know	personal economic and	Generally knows	state exam
	methods of personal economic	how to achieve financial goals,	financial planning.	how to achieve financial goals by	Fully proficient in the ability to
	and financial	applying methods		applying methods	achieve financial
	planning.	of personal		of personal	goals by applying
		economic and financial planning.		economic and financial planning.	personal economic and financial
		innanonai pranning.		interioren presintig.	planning methods.
	Know the tools of	Does not know the	Satisfactory knowledge	•	Fully knows the
U I	financial	tools of financial	of financial	the tools of	tools of financial
	mathematics when answering the	mathematics when answering the	mathematics tools when answering the questions	financial mathematics when	mathematics when answering the
and financial risks	questions of the	questions of the	of the state exam and	answering the	questions of the
	state exam and	state exam and	additional questions on	questions of the	state exam and
	additional	additional	personal finance	state exam and	additional
	questions on personal finance	questions on personal finance	management (budget), partially able to answer	additional questions on	questions on personal finance
	management	management	the questions of the	personal finance	management
	(budget), is able to	(budget), does not	SEC on the application	management	(budget), is able to
	answer the	know how to	of financial tools to	(budget), partially	answer the
	questions of the SEC on the	answer the questions of the	control own economic and financial risks;	able to answer the questions of the	questions of the SEC on the
		questions of the			SEC on the

		financial tools to control own economic and financial risks; Knows how to answer the SEC questions on the application of financial tools to control own economic and financial risks.	application of financial tools to control own economic and financial risks; Does not know the ability to answer the SEC questions on the application of financial tools to control their own economic and financial risks.	to answer the questions of the SEC on the application of financial instruments to control own economic and financial risks.	applicationoffinancial toolstocontrolowneconomicandfinancial risks;andAt a goodlevelwith some gaps isable to answer thequestionsoftheSEConapplicationoffinancialinstrumentstocontroltheirowneconomicand	financial tools to control own economic and financial risks; At a high level with small gaps is able to answer the questions of the SEC on the application of financial instruments to control their own economic and financial risks.
					financial risks.	
UC.12 Able	e to form an intolerant at	titude towards corru	pt behavior			
UC.12.2.	Uses ways to prevent corruption and form an intolerant attitude to corrupt behavior in various areas of life.	Know the methodological recommendations on the methods of corruption prevention and be able to apply them to form an intolerant attitude towards corruptive behavior while preparing for and taking the state	Does not know the methodological recommendations on the methods of corruption prevention and does not know how to apply them to form an intolerant attitude towards corruptive behavior while preparing for and taking the state	Partially knows the methodological recommendations on the methods of corruption prevention and partially knows how to apply them to form an intolerant attitude towards corruptive behavior during the preparation for and taking the state exam;	In general, with minor gaps, knows the methodological recommendations on the methods of corruption prevention and is able to apply them to form an intolerant attitude towards corruptive behavior during the preparation and	Fully knows and uses methodological recommendations on the methods of corruption prevention and is able to apply them to form an intolerant attitude towards corrupt behavior during the preparation

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		exam;	exam;	Partially possesses the	taking the state	and taking the
		Have the ability,	Does not have the	ability, using the	exam;	state exam;
		using the methods	ability to use the	methods of corruption	At a good level	At a high level
		of corruption	methods of	prevention, if	possesses the	possesses the
		prevention, if	corruption	necessary, to	ability, using the	ability, using the
		necessary, to	prevention, if	reasonably suppress	methods of	methods of
		reasonably	necessary, to	corruptive behaviour	corruption	corruption
		suppress corruptive	reasonably	while preparing for and	prevention, if	prevention, if
		behavior when	suppress corruptive	taking the state exam	necessary, to	necessary, to
		preparing and	behavior while	_	reasonably	reasonably
		taking the state	preparing and		suppress corruptive	suppress
		exam	taking the state		behavior during the	corruptive
			exam		preparation for and	behavior during
					taking the state	the preparation for
					exam	and taking the
						state exam
UC.12.3	Conducts interaction on	Know the basic	Does not know the	Fragmentarily knows	In general, knows	Fully knows the
	the basis of intolerant	legal principles and	basic legal	the basic legal	the basic legal	basic legal
	attitude towards corrupt	norms that form an	principles and	principles and norms	principles and	principles and
	behavior in social and	intolerant attitude	norms that form an	that form an intolerant	norms that form an	norms that form an
	professional spheres	towards corruptive	intolerant attitude	attitude to corruptive	intolerant attitude	intolerant attitude
	Freiessienen Spieres	behavior in social	towards corruptive	behavior in social and	to corruptive	to corruptive
		and professional	behavior in social	professional spheres,	behavior in social	behavior in social
		spheres, applied in	and professional	applied in the future	and professional	and professional
		the future	spheres, applied in	profession and the	spheres, applied in	spheres, applied in
		profession and the	the future	consequences of their	the future	the future
		consequences of	profession and the	violation, interacting	profession and the	profession and the
		their violation,	consequences of	with the members of the	consequences of	consequences of
		interacting with	their violation,	SEC when answering	their violation,	their violation,
		members of the	interacting with	the questions of the	interacting with	interacting with
		SEC when	members of the	examination ticket and	members of the	members of the
		answering	SEC when	additional questions;	SEC when	SEC when
	1	answoring		additional questions,	SLC WICH	SLC WIICH
		questions on the	answering the	partially able to apply	answering	answering

e	examination ticket	questions of the	basic legal principles	questions on the	questions on the
a	and additional	1	0 1 1	-	1
q	questions; can	and additional	intolerant attitude to	and additional	and additional
a	apply the basic	questions; is not	corruptive behavior in	questions; in	questions; fully
16	egal principles and	-	interaction during the	-	able to apply the
n	norms that form an		C C	•	
ii	ntolerant attitude				
te	owards corruptive	norms that form an		norms that form an	norms that form an
b	behavior when	intolerant attitude		intolerant attitude	intolerant attitude
ii	nteracting during	towards corruptive		to corruptive	to corruptive
tl	he preparation and	behavior when		behavior when	behavior when
ta	aking the state	interacting during		interacting during	interacting during
e	examination.	the preparation and		the preparation and	the preparation
		taking the state		taking the state	and taking the
		exam.		exam.	state exam.
Criteria for assessing learning outcom	ies	unsatisfactory	satisfactory	good	excellent
		-			

4.2. Planned learning outcomes for the formation of general professional competencies and criteria for their evaluation

a			Criteria and indicat	tors of assessment of le	arning outcomes and	competence level
Compete ncy codes	Competency name	Learning outcomes	Insufficient	Threshold	Basic	High
~~~ ~ ~ ~						High
	able to understand the decisions within their pr		nomic system developi	nent and based on t	hem to offer sound	organizational and
GPC.1.1	understands the regularities of economic system development and can explain the reasons for its changes within their professional activities	To know the basic laws of development of socio-economic systems; To be able to analyze the processes taking place in socio- economic systems, to identify positive and negative dynamics in accordance with the questions of the examination ticket;	economic systems; Does not know how to analyze the processes taking place in socio-economic systems, to identify positive and negative dynamics in accordance with the questions of the examination ticket; Does not have the skills to explain the causes of changes in	Partially knows the basic laws of development of socio-economic systems; Partially able to analyze the processes taking place in socio- economic systems, to identify positive and negative dynamics in accordance with the questions of the examination ticket; Fragmentarily knows the skills of	In general, knows the basic laws of development of socio-economic systems; At a good level with some gaps is able to analyze the processes taking place in socio- economic systems, to identify positive and negative dynamics in accordance with the questions of the examination ticket;	able to analyze the processes taking place in socio- economic systems, to identify positive and negative dynamics in accordance with the questions of the examination ticket; Fully masters the
		To be able to explain the causes of changes in the economic system within the answers	the economic system within the answers to the questions of the examination ticket.	explaining the causes of changes in the economic system within the answers to the questions of the	In general, has the skills to explain the causes of changes in the economic system within the	skills of explaining the causes of changes in the economic system within the answers

		to the questions of		examination ticket.	answers to the	to the questions of
		the examination			questions of the	the examination
		ticket.			examination ticket.	ticket.
GPC.1.2	has an idea of the basic	Introduces the	Does not represent the	Partially presents the	In general, the basic	Fully presents the
UFC.1.2	principles and methods		basic principles and	basic principles and	principles and ways	
	of functioning and	1 1	ways of functioning	ways of functioning	of functioning and	1 1
	U	2	and management of		-	and ways of functioning and
	management of economic systems, can	U	U	and management of	management of economic systems	0
	name them, understands	0	<b>,</b>	economic systems;	•	
	the order and cases of	economic systems; Can name the	Can not name the	Can name some	are presented; Can	economic systems;
			basic principles and	basic principles and	name in general the	Can systematically
	their application	basic principles	ways of functioning	ways of functioning	basic principles and	and completely
		and ways of	and management of	and management of	•	name the basic
		functioning and	economic systems;	economic systems;	and management of	principles and
		management of	Does not understand	Partially understands	economic systems;	ways of
		economic systems;	the order and cases of	the order and	In general, with	functioning and
		Understands the	application of the	application of basic	some gaps,	management of
		order and	basic principles and	principles and ways	understands the	economic systems;
		application of the	ways of functioning	of functioning and	order and cases of	Fully understands
		basic principles	and management of	management of	application of basic	the order and
		and ways of	economic systems	economic systems	principles and ways	application of the
		functioning and			of functioning and	basic principles
		management of			management of	and ways of
		economic systems			economic systems	functioning and
						management of
						economic systems
				•	·	
	able to apply statistical	and economic-math	ematical methods for	processing economic	information and iden	ntifying patterns in
economic	processes					

CDC 4.1	annling basis mother le	To Imper the hereit	Dees not Imary 41-	Douting I have a state of a	In concerct:41	Confidently Im-
GPC.4.1	applies basic methods	To know the basic	Does not know the	Partial knowledge of	0	Confidently knows
	of mathematical	mathematical	basic mathematical	basic mathematical	some gaps knows	the basic
	analysis to quantify	methods and	methods and models	methods and models	the basic	mathematical
	socio-economic	models in	in answering the	in answering the	mathematical	methods and
	processes;	answering the	questions of the SEC,	questions of the	methods and	models in
		questions of the	Does not know how	SEC, fragmented	models in	answering the
		SEC, to be able to	to apply basic	ability to apply basic	answering the	questions of the
		apply basic	knowledge of	knowledge of	questions of the	SEC, is able to
		knowledge of	mathematics in	mathematics in the	SEC, in general is	apply basic
		mathematics in	answering the exam	answers to the	able to apply basic	knowledge of
		answering the	ticket; Does not know	examination ticket;	knowledge of	mathematics in the
		exam ticket; to	the ability to apply	satisfactory	mathematics in the	answers to the
		have the ability to	mathematical	knowledge of the	answers to the	examination ticket;
		apply	knowledge in	ability to apply	examination ticket;	fully owns the
		mathematical	preparing and	mathematical	well owns the	ability to apply
		knowledge in	answering the SEC.	knowledge in	ability to apply	mathematical
		preparing and		preparing and	mathematical	knowledge in
		answering the		answering the SEC.	knowledge in	preparing and
		SEC.		unswering the SEC.	preparing and	answering the
		SEC.			answering the SEC.	SEC.
					answering the BLC.	BLC.
GPC.4.3	establishes and studies	To know the basic	Does not know the	Partially knows the	In general knows	Fully knows the
01 01 115	the relationships	mathematical	basic mathematical	basic mathematical	the basic	basic mathematical
	between economic	methods and tools	methods and tools to	methods and tools to	mathematical	methods and tools
	processes and	to analyze the	analyze the	analyze the	methods and tools	to analyze the
	phenomena using	relationship of	relationship of	relationship of	to analyze the	relationship of
	mathematical and	economic	economic processes	economic processes	relationship of	economic
	statistical methods and	processes and	and phenomena, the	and phenomena, the	economic processes	processes and
	models	-	characteristics of the	characteristics of the	and phenomena, the	1
	mouers	1 '		studied economic	characteristics of	phenomena, the
		characteristics of				characteristics of
		the studied	processes in terms of	processes in terms of	the studied	the studied
		economic	the peculiarities of	the peculiarities of	economic processes	economic
		processes in terms	their flow in	their course in	in terms of the	processes in terms
		of the peculiarities	accordance with the	accordance with the	peculiarities of their	of the peculiarities

			~	
of their course in	questions of the	questions of the	flow in accordance	of their course in
accordance with	examination ticket.	examination ticket.	with the questions	accordance with
the questions of	Does not know how	Fragmentally able to	of the examination	the questions of the
the examination	to justify the	justify the	ticket.	examination ticket.
ticket.	correctness of the	correctness of the	In general, with	At a high level can
To be able to	choice of theoretical	choice of theoretical	some gaps, is able	justify the
justify the	and/or econometric	and/or econometric	to justify the	correctness of the
correctness of the	model, taking into	model, taking into	correctness of the	choice of
choice of	account the	account the	choice of	theoretical and/or
theoretical and/or	peculiarities of the	peculiarities of the	theoretical and/or	econometric
econometric	relationships of the	relationships of the	econometric model,	model, taking into
model, taking into	analyzed object of	analyzed object of	taking into account	account the
account the	research in the	research in the	the peculiarities of	peculiarities of
peculiarities of the	process of answering	process of answering	interrelations of the	interrelations of the
relationships of the	the questions of the	the questions of the	analyzed object of	analyzed object of
analyzed object of	examination ticket.	examination ticket.	research in the	research in the
research in the	Does not know how	Partially able to	process of	process of
process of	to construct the	construct the	answering the	answering the
answering the	relationship and	relationship and	questions of the	questions of the
questions of the	conduct the study of	conduct the study of	examination ticket.	examination ticket.
examination ticket.	its reliability by basic	its validity by the	At a good level	At a high level is
To be able to build	criteria in the	basic criteria in the	with some gaps is	able to construct
an econometric	presence of the	presence of the	able to construct the	the relationship
model and conduct	necessary data in the	necessary data in the	relationship and	and conduct a
a study of its	exam questions.	exam questions.	conduct a study of	study of its
validity according	Does not know the	Partially knows how	its reliability by the	reliability by basic
to the basic criteria	skills of selecting	to select indicators	basic criteria in the	criteria in the
in the presence of	indicators for the	for the analysis of	presence of the	presence of the
the necessary data	analysis of	interrelationships of	necessary data in	necessary data in
in the exam	interrelationships of	economic processes	the exam questions.	the exam
questions.	economic processes	and phenomena,	In general, knows	questions.
To be able to	and phenomena,	taking into account	the skills of	Fully masters the
select indicators	taking into account	the reliability	selecting indicators	skills of selecting
for the analysis of	the requirements of	requirements.	to analyze the	indicators to

GPC.5. Is a	able to study various mar	relationships, taking into account the reliability requirements. kets of goods (works	reliability. , services) to perform th	ne tasks of his/her prof	relationship of economic processes and phenomena, taking into account the requirements of reliability.	analyze the interrelationships of economic processes and phenomena, taking into account the reliability requirements.
GPC.5.1.	names and comments on the rules and methods of market research and analysis, understands the patterns of development of markets for individual goods and services	Know the rules and methods of market research and analysis, understand the patterns of market development in the course of answering the examination ticket or additional questions	Does not know the rules and methods of market research and analysis, does not understand the patterns of market development in the course of answering the examination ticket or additional questions	Partial knowledge of the rules and methods of market research and analysis, does not fully understand the patterns of market development in the course of answering the examination ticket or additional questions	In general, at a good level knows the rules and methods of market research and analysis, in general understands the patterns of market development in the course of answering the examination ticket or additional questions	At a high level knows the rules and methods of market research and analysis, fully understands the laws of market development in the course of answering the examination ticket or additional questions
GPC.5.2.	names and comments on methods and modern technologies of working with consumers and understands their importance in solving their professional tasks	To know the basic market technologies and concepts; To be able to answer the relevant questions of the SEC to focus on the needs of the market; To	Does not know the basic market technologies and concepts; Does not know how to respond to the relevant questions of the SEC to focus on the needs of the market; Does	Fragmentary knowledge of basic market technologies and concepts; Partially able to respond to the relevant questions of the SEC to focus on the needs of the	In general, with few significant gaps, knows the basic market technologies and concepts; At a good level is able to respond to the relevant SEC questions to focus	At a high level knows the basic market technologies and concepts; Fully able to respond to the relevant questions of the SEC to focus on

GPC.6. At	Die to apply regulatory leg	have the skills to effectively use the methods and modern technologies of working with consumers in accordance with the tasks set by the SEC al acts in professiona	not have the skills to effectively apply the methods and modern technologies of working with consumers in accordance with the tasks set by the SEC	market; In general, with significant gaps possess the skills to effectively apply methods and modern technologies of working with consumers in accordance with the tasks set by the SEC	on the needs of the market; In general, with minor gaps has the skills to effectively apply methods and modern technologies of working with consumers in accordance with the tasks set by the SEC	the needs of the market; Fully skilled in the effective application of methods and modern technologies of working with consumers in accordance with the tasks set by the SEC
GPC.6.1	searches for regulatory documents in the field of professional activity	Know the basic principles and ways of searching for normative legal documents used in the future profession; can find normative legal documents and use the results of the search when answering questions on the examination ticket	Does not know the basic principles and methods of searching for regulatory documents used in the future profession; does not know how to find regulatory documents and use the results of the search when answering questions on the examination ticket	Partially knows the basic principles and ways of searching for normative legal documents used in the future profession; partially knows how to find normative legal documents and use the results of the search when answering questions on the examination ticket	In general, knows the basic principles and methods of searching for regulatory documents used in the future profession; in general, is able to find regulatory documents and use the results of the search when answering questions on the examination ticket	Fully knows the basic principles and ways of searching for regulatory documents used in the future profession; at a high level shows the ability to find regulatory documents and use the results of the search when answering questions on the examination ticket

	able to model, analyze ar oals using modern methoo	-	-	ation technology infra	structure of an enter	prise to achieve its
GPC.7.1.	analyzes the business processes of an enterprise in order to achieve its strategic goals	Know the basic principles, approaches to the analysis of business processes of the enterprise, be able to determine on the basis of common principles and approaches to achieve the strategic objectives of the enterprise architecture of business processes of the enterprise; possess the ability in response to the exam ticket or additional question to identify common principles and approaches to the design of enterprise business processes.	Does not know the basic principles, approaches to the analysis of business processes of the enterprise, is not able to determine on the basis of general principles and approaches to achieve the strategic objectives of the enterprise architecture of business processes of the enterprise; does not possess the ability to identify general principles and approaches to the design of enterprise business processes in response to the examination ticket or additional question.	Partially knows the basic principles, approaches to the analysis of business processes of the enterprise, to some extent is able to determine the architecture of business processes of the enterprise based on general principles and approaches to achieve the strategic goals of the enterprise; at a satisfactory level has the ability in response to the examination ticket or additional question to identify general principles and approaches to the design of enterprise business processes.	the basic principles, approaches to the analysis of business processes of the enterprise, in general with small gaps is able to identify the architecture of business processes of the enterprise based on general principles and approaches to achieve the strategic objectives	Fully knows the basic principles approaches to the analysis of business processes of the enterprise, in general at a high level is able to identify the architecture of business processes of the enterprise based on general principles and approaches to achieve the strategic objectives of the enterprise; a a high level has the ability to identify general principles and approaches to the design of enterprise business processes in response to the examination ticke or additiona question.

GPC.7.3.	analyzes the	To know the	Does not know the	Partially knows the	In general, with	At a high level
	information and	methods,	methods, principles of	methods, principles	some gaps, knows	knows the
	technological	principles of	analysis of enterprise	of analysis of	the methods,	methods, principles
	infrastructure of the	analysis of	IT infrastructure	enterprise IT	principles of	of analysis of
	enterprise in order to	enterprise IT	components to	infrastructure	analysis of	enterprise IT
	improve it to achieve	infrastructure	achieve the strategic	components to	enterprise IT	infrastructure
	the strategic goals of the	components in	goals of the owner	achieve the strategic	infrastructure	components to
	owners	order to achieve	and support related to	goals of the owner	components to	achieve the
		the strategic goals	these goals business	and support of	achieve the	strategic goals of
		of the owner and	processes; does not	business processes	strategic goals of	the owner and
		support the	know how to show in	corresponding to	the owner and	support
		business processes	response to the	these goals; to some	support related to	corresponding to
		corresponding to	relevant question	extent is able to	these goals business	these goals of
		these goals; to be	knowledge of	show knowledge of	processes; in	business processes;
		able to show in	methods, principles of	the methods,	general, is able to	in general is able to
		response to the	analysis of enterprise	principles of analysis	show in response to	show in response
		relevant question	IT infrastructure	of enterprise IT	the relevant	to the relevant
		knowledge of the	components to	infrastructure	question knowledge	question
		methods,	achieve the strategic	components to	of methods,	knowledge of
		principles of	goals of the owner	achieve the strategic	principles of	methods, principles
		analysis of	and support related to	goals of the owner	analysis of	of analysis of
		enterprise IT	these goals business	and support of	enterprise IT	enterprise IT
		infrastructure	processes; does not	business processes	infrastructure	infrastructure
		components in	have the ability, in	corresponding to	components to	components to
		order to achieve	accordance with the	these goals in	achieve the	achieve the
		the strategic goals	objectives of the SEC,	response to the	strategic goals of	strategic goals of
		of the owner and	to identify methods to	relevant question; at	the owner and	the owner and
		support the	analyze the IT	a satisfactory level		support
		business processes	infrastructure	has the ability, in	these goals business	corresponding to
		corresponding to	components of the	accordance with the	processes; at a good	these goals of
		these goals; to	enterprise to achieve	tasks of the SEC to	level has the ability,	business processes;
		possess the ability,	the strategic	identify methods,		at high level has
		in accordance with	objectives of the	analysis of the	the tasks of the SEC	the ability, in
		the tasks of the	owner and support the	components of the IT	to identify methods,	accordance with

		SEC to identify methods, analysis of enterprise IT infrastructure components in order to achieve strategic goals of the owner and support the business processes corresponding to these goals	corresponding goals of business processes.	infrastructure to achieve the strategic goals of the owner and support of business processes corresponding to these goals.	analysis of IT infrastructure components.	the tasks of the SEC to identify methods, analysis of IT components.
	able to use information, r	nethods and softwar	e of its collection, proc	cessing and analysis fo	or information and a	nalytical support of
manageme	nt decisions					
GPC.9.1.	Is able to use information, methods and software of its collection, processing and analysis for information and analytical support of management decisions	To know the rules of selection and processing of necessary information for reasonable use for information and analytical support of managerial decision-making, applying a variety of methods of scientific and applied research in preparation for the SEC and when preparing an answer to the	rules of selection and processing of necessary information for reasonable use for information and analytical support of managerial decision- making, applying a variety of methods of scientific and applied research in preparation for the SEC and when preparing an answer to the questions of the examination ticket;	Partially knows the rules of selection and processing of necessary information for reasonable use for information and analytical support of managerial decision- making, partially applying a variety of methods of scientific and applied research to prepare for the SEC and when preparing an answer to the questions of the examination	the rules of selection and processing of necessary information for reasonable use for information and analytical support of managerial decision-making, with minor inaccuracies applying a variety of methods of scientific and applied research to	Fully knows the rules of selection and processing of necessary information for reasonable use for information and analytical support of managerial decision-making, applying a variety of methods of scientific and applied research to prepare for the SEC and when preparing an answer to the

		I			
-	ns of the to analyz				estions of the
examir	ation ticket; the	•	analyze with an a	answer to the exa	amination ticket;
be able	to analyze informati	on sources errors	and select the quest	tions of the Ca	n at a high level
and	select the for their	reasonable necessa	ary exam	ination ticket; ana	alyze and select
necessa	5		ation sources can	generally at a the	e necessary
inform	ation informati	onal and for the	eir reasonable good	level analyze inf	ormation
sources	for their analytica	l support of use i	n order to and	select the sou	arces for their
reasona	ble use in managem	information inform	ational and neces	ssary rea	sonable use for
order	to decisions	, in analyti	cal support of inform	mation sources inf	formation and
inform	ational and preparation	on for the manage	ement for the	heir reasonable ana	alytical support
analyti	cal support SEC;	decisio	ns, in use	in order to of	management
of	nanagement Does no	t know the prepara	tion for the inform	mational and dec	cisions, in
		reasonable SEC;		tical support pre	eparation for the
	paration for selection	and Partiall	y knows the of	management SE	Ċ;
the SE			-	-	general, fully
know	he rules of necessary	information selection	on and when	preparing for ow	ins the rules of
reasona	ble for info	rmation and process	sing of the S	EC; rea	isonable
selection	n and analytical	l support of necessa	ary In ge	neral, owns the sel	ection and
process	ing of manageri	al decision- information	ation for rules	of reasonable pro	ocessing of
necessa	ry making,	applying a inform	ation and selec	tion and neo	cessary
inform	ation for variety o	f methods of analytic	cal support of proce	essing of inf	formation for
inform	-	and applied manage		ssary inf	ormation and
analyti	cal support research	to prepare decisio	n-making, infor	mation for ana	alytical support
of	managerial for the		-	mation and of	management
decisic	n-making, preparing	g an answer variety	of methods of analy	tical support dec	cision-making,
	• • • •	•	ic and applied of		plying a variety
			11	0 11	methods of
scientit	ic and			0	entific and
applied	research to	prepari		•	plied research to
prepare			questions of scien		epare for the
SEC	and in	the	examination appli	1	C and when
prepari	ng an	ticket.	prepa	are for the SEC pre	eparing an
answer	to the		and i		swer to the
questio	ns of the		answ	1 1 0	estions of the

		examination ticket.			questions of the examination ticket.	examination ticket.
Criteria for assessing learning outcomes		unsatisfactory	satisfactory	good	excellent	

## 4.3. Planned learning outcomes for the formation of professional competencies and criteria for their evaluation

			Criteria and indicators of assessment of learning outcomes and competence level						
Compete ncy codes	Competency name	Learning outcomes	Insufficient	Threshold	Basic	High			
PC.1 Able	PC.1 Able to justify decisions								
PC.1.1	Forms possible solutions based on the targets developed for them	To know the basic mathematical methods and tools for the formation of possible solutions based on the target indicators developed for them in accordance with the questions of the examination ticket. To be able to justify the correctness of the choice of the formed solution based on the features of target indicators in the process of answering the questions of the examination ticket. To master the skills of selecting	Does not know the basic mathematical methods and tools for the formation of possible solutions based on the target indicators developed for them in accordance with the questions of the examination ticket. Does not know how to justify the correctness of the choice of formed solution based on the features of target indicators in the process of answering the questions of the examination ticket. Does not know the skills of selecting indicators to form a possible solution taking	Partially knows the basic mathematical methods and tools for the formation of possible solutions based on the developed for them target indicators in accordance with the questions of the examination ticket. Can justify with the help of leading questions the correctness of the choice of formed solution based on the features of target indicators in the process of answering the questions of the examination ticket. Partially possesses	In general, with some inaccuracies knows the basic mathematical methods and tools for the formation of possible solutions based on the target indicators developed for them in accordance with the questions of the examination ticket. In general, is able to justify the correctness of the choice of the formed solution based on the features of target indicators in the process of answering the questions of the examination ticket.	Fully knows the basic mathematical methods and tools for the formation of possible solutions based on the developed for them target indicators in accordance with the questions of the examination ticket. At a high level can generally justify the correctness of the choice of the formed solution based on the features of target indicators in the process of answering the questions of the examination ticket. Fully knows the skills of selecting			

PC.1.2Analyzes, justifies and selects a solutionMaster the ability to analyze with quantitative and quantitative methods, justify (interpret) and on the specific situation; situation; know the methods of quantitative and solution depending on the specific situation; situation; know the methods of quantitative analysis, ijustify and choose a solution depending on the specific situation; situation depending on the specific situation; situation; know the methods of quantitative analysis, ijustify and choose a solution depending on the specific situation; situation depending on the specific situation; solution depending on the specific situation; methods of quantitative and qualitative analysis, ijustify and choose a solution depending on the specific situation; methods of quantitative and qualitative analysis, ijustify and choose a solution depending on the specific situation; methods of quantitative and qualitative analysis, ijustify and choose a solution depending on the specific situation; methods of quantitative and qualitative analysis, ijustifies and can with the help of leading on the specific situation depending on the specific situation offered as an example when answering the questions of the SEC.Does not how the methods of the solution depending on the specific situation offered as an example when answering the questions of the SEC.Generally knows the adialitative analysis, ipustifies and can with the help of leading on the specific on the specific situation offered as an example when an example when<		indicators to form a possible solution taking into account the credibility requirements.	into account the requirements of reliability.	the skills of selecting indicators to form a possible solution taking into account the reliability requirements.	In general owns the skills of selecting indicators for the formation of a possible solution taking into account the requirements of reliability.	indicators to form a possible solution, taking into account the requirements of reliability.
PC.3 Able to plan and organize analytical work, including the use of big data technologies	selects a solution	analyze with quantitative and qualitative methods, justify (interpret) and choose a solution depending on the specific situation; know the methods of quantitative and qualitative analysis, justify and choose a solution depending on the specific situation offered as an example when answering the questions of the SEC.	ability to analyze with quantitative and qualitative methods, justify (interpret) and choose a solution depending on the specific situation; Does not know the methods of quantitative and qualitative analysis, does not justify and cannot choose a solution depending on the specific situation offered as an example when answering the questions of the SEC.	the ability to analyze with quantitative and qualitative methods, justify (interpret) and choose a solution depending on the specific situation; Partially knows the methods of quantitative analysis, justifies and can with the help of leading questions choose a solution depending on the specific situation proposed as an example in answering the questions of the SEC.	Generally knows the ability to analyze with quantitative and qualitative methods, justifies (interprets) and chooses the solution depending on the specific situation; At a good level knows the methods of quantitative and qualitative analysis, justifies and can with some inaccuracies choose a solution depending on the specific situation offered as an example in answering the questions of the	ability to analyze with quantitative and qualitative methods, justifies (interprets) and select the solution depending on the specific situation; At a high level knows the methods of quantitative and qualitative analysis, justifies and can confidently choose a solution depending on the specific situation offered as an example when answering the questions of the

PC.3.3.	Determines the	To know the	Does not know the	Partially knows the	In general, with	The confident
	necessary resources for	ways, methods	ways, methods and	ways, methods and	minor gaps,	knows the
	analytical work	and be able to	does not know how to	is able to apply	knows the	methods, methods
		apply them in	apply them in order	them in order to	methods, methods	and is able to
		order to assess the	to assess the	estimate the	and is able to	apply them in
		necessary	necessary resources	necessary	apply them in	order to estimate
		resources (time,	(time, material, etc.)	resources (time,	order to assess the	the necessary
		material, etc.) to	to carry out analytical	material, etc.) to	necessary	resources (time,
		carry out	work and tasks of the	conduct analytical	resources (time,	material, etc.) to
		analytical works	state exam;	works and tasks of	material, etc.) to	conduct analytical
		and fulfill the	Does not know how	the state exam;	carry out	works and fulfill
		tasks of the state	to assess the available	Partially knows	analytical work	the tasks of the
		exam;	resources (time,	how to assess the	and fulfill the	state exam;
		To be able to	material, etc.)	available resources	tasks of the state	The confident
		assess the	necessary to carry out	(time, material,	exam;	ability to assess
		available	analytical works,	etc.) necessary to	In general, with	the available
		resources (time,	(including) to solve	conduct analytical	insignificant gaps,	resources (time,
		material, etc.)	the tasks of the State	works, (including)	is able to assess	material, etc.)
		necessary to carry	Examination.	to solve the tasks	the available	necessary to carry
		out analytical	Does not have the	of the State	resources (time,	out analytical
		works (including)	ability to assess the	Examination.	material, etc.)	works, (including)
		the tasks of the	resources (time,	Partially knows the	necessary to	to solve the tasks
		State	material, etc.) for the	ability to assess the	conduct analytical	of the State
		Examination.	successful	resources (time,	works, (including)	Examination is
		Have the ability to	performance of	material, etc.) for	to solve the tasks	formed.
		assess the	analytical work,	the successful	of the State	Successfully owns
		resources (time,	including the tasks of	performance of	Examination.	the ability to
		material, etc.) for	the State	analytical works,	In general, with	assess the
		the successful	Examination.	including the tasks	insignificant gaps,	resources (time,
		performance of		of the State	has the ability to	material, etc.) for
		analytical work,		Examination	assess the	the successful
		including the tasks			resources (time,	performance of
		of the State			material, etc.) for	analytical works,
		Examination			the successful	including the tasks

		Committee.			performance of analytical work, including the tasks of the SEC.	of the SEC.
PC.3.4.	Develops, discusses and approves a plan of analytical work	To know modern technologies to develop, discuss and approve the stages of planning and organization of analytical work, including to answer additional questions of the SEC if necessary; to be able to apply knowledge of modern technologies to determine the stages of planning and organization of analytical activities, including to answer additional questions of the SEC if necessary; to possess the ability to apply knowledge of modern technologies to determine the stages of planning and organization of	Does not know modern technologies to develop, discuss and approve the stages of planning and organization of analytical work, including to answer additional questions of the SEC if necessary; Does not know how to apply knowledge of modern technologies to determine the stages of planning and organization of analytical activities, including to answer additional questions of the SEC if necessary; Does not have the ability to apply the knowledge of modern technology to determine the stages of planning and organization of analytical activities, including to answer additional questions of the SEC if necessary; Does not have the ability to apply the knowledge of modern technology to determine the stages of planning and organization of analytical activities, including when answering the questions	Partially knows modern technologies to develop, discuss and approve the stages of planning and organizing analytical work, including to answer additional questions of the SEC if necessary; Fragmentarily knows how to apply knowledge of modern technologies to determine the stages of planning and organizing analytical activities, including to answer additional questions of the SEC if necessary; Partially knows the ability to apply knowledge of modern technologies to determine the stages of planning and organizing	In general, with some inaccuracies knows modern technologies for the development, discussion and approval stages of planning and organization of analytical work, including to answer, if necessary, additional questions of the SEC; In general, with some inaccuracies knows how to apply knowledge of modern technologies to determine the stages of planning and organization of analytical activities, including to answer, if necessary, additional questions of the SEC; In general, with some	Proficient knowledge of modern technology to develop, discuss and approve the stages of planning and organizing analytical work, including to answer additional questions of the SEC if necessary; In general, at a high level is able to apply knowledge of modern technology to determine the stages of planning and organizing analytical work, including to answer additional questions of the SEC if necessary; High level of proficiency ability to apply knowledge of modern technology
		analytical activities,	of the SEC	analytical work	inaccuracies knows	to determine the

PC.5. Abil	ity to analyze requirement	including the questions of the SEC			how to apply knowledge of modern technologies	stages of planning and organizing analytical work
PC.5.2.	Specifies (documents) the requirements for the IS	To know the basic principles, approaches, methods of specification of IS requirements; To be able to apply the basic principles, approaches, methods of specification of requirements to the IS; To be able to identify the basic principles and methods of documenting requirements to the IS in answering the questions of the exam ticket or additional questions	Does not know the basic principles, approaches, methods of specification of requirements for the IS; Does not know how to apply the basic principles, approaches, methods of specification of requirements to the IS; Does not know the ability to identify the basic principles and methods of documenting the IS requirements in answering the questions of the examination ticket or additional questions	the basic principles, approaches, methods of specification of IS requirements; Fragmentary knows how to apply basic principles, approaches, methods of specification of requirements to the IS; Partially knows the	In general, knows the basic principles, approaches, methods of specification of requirements for the IS with minor inaccuracies; Can apply basic principles, approaches, methods of specification of requirements to the IS with minor inaccuracies; In general, is able to identify the basic principles and methods of documenting the IS requirements in answering the questions of the examination questionnaire or additional questions	Confidently knows the basic principles, approaches, methods of specification of requirements for the IS; The ability to apply the basic principles, approaches, methods of specification of requirements to the IS is formed; In the answer to the questions of the examination ticket or additional questions to identify the basic principles and methods to conduct the documentation of requirements to IS.
PC.5.3.	Verifies (conducts verification) of IS	To know the methodologies,	Does not know the methodologies,	Partial knowledge of methodologies,	In general, knows the methodologies,	He/she is confident in methodologies,

requirements	techniques,	techniques, principles	techniques, principles	techniques,	techniques,
	principles of	of verification of IS	of verification of IS	principles of	principles of
	verification of IS	requirements;	requirements;	verification of IS	verification of IS
	requirements;	Does not know how to	Partial ability to	requirements;	requirements;
	To be able to apply	apply the	apply methodologies,	In general, is able to	Successfully knows
	the methodologies,	methodologies,	techniques, principles	apply the	how to apply the
	techniques and	techniques and	of verification of IS	methodologies,	methodologies,
	principles of	principles of	requirements;	techniques,	techniques,
	verification of IS	verification of IS	Partially obtained the	principles of	principles of
	requirements;	requirements;	skill in answering the	verification of	verification of
	To be able to answer	Does not know the	questions of the exam	requirements to the	requirements to the
	the questions of the	ability to answer the		IS;	IS;
	exam ticket or	questions on the exam	1 0	In general, with	Completely obtained
	additional questions	ticket or additional	1 1	some gaps obtained	the skill in
	to identify the basic		-	the skill in	answering the
	principles and	basic principles and	-	answering the	questions of the
	methods to verify	methods to verify the	the IS.	questions of the	exam ticket or
	the requirements to	requirements for the IS.		examination ticket or	additional questions
	the IS.			additional questions	to identify the basic
				to identify the basic	principles and
				principles and	methods to verify
				methods to verify	the requirements for
				the requirements for	the IS.
				the IS.	
Criteria for assessing learning	ng outcomes	unsatisfactory	satisfactory	good	excellent

#### 4.4 Criteria for assessing the results of the State Examination

A graduate is considered compliant with the requirements of the PSNRU SEES of HE if he/she demonstrates a set of knowledge and skills during the final exam, indicating his/her readiness (ability) to solve professional problems in typical situations without errors of principle.

Evaluation Criteria:

1. Correctness, absence of principle errors in the answer to the questions of the ticket (UC.2.1, UC.2.2, PC.1.1, PC.1.2, UC.5.4, UC.5.5).

2. Completeness of material disclosure (UC.1.1)

Argumentation (UC.4.1, GPC.6.1).

4. Ability to independently present the material competently, to use terminology accurately and summarize the material (UC.4.1, UC.4.2).

5. Understanding of intra- and interdisciplinary connections (UC.11.1, GPC.1.1, GPC.1.2, GPC.4.1, GPC.4.3).

6. Ability to connect theory and practice (GPC.5.1, GPC.5.2, GPC.7.1, GPC.7.3, GPC.9.1, PC.5.2, PC.5.3).

7. General impression, other (UC.5.1, UC.5.2, UC.7.1, UC.7.2, UC.8.3, UC.11.2, UC.11.3, UC.12.2, UC.12.3, PC.3.3, PC.3.4).

The answer of the graduate is evaluated by "excellent", "good", "satisfactory", "unsatisfactory".

Criteria for assessing the questions of the ticket:

The ticket includes 2 theoretical questions and practical task in the form of a case on the disciplines studied in accordance with the curriculum of the Bachelor's degree program in 38.03.05 "Business Informatics", which are crucial to the professional activities of graduates.

Each question of the ticket is rated on a four-level scale of marks ("excellent", "good", "satisfactory", "unsatisfactory").

A grade of "excellent" is given if the graduate:

1. gives correct, detailed, reasoned answers to the questions of the ticket, fully discloses the content of the material of the examination ticket;

2. shows a systematic and in-depth knowledge of the program material, shows knowledge of the disciplines as a whole, understands the intra- and interdisciplinary connections;

3. states the material correctly, in a certain logical sequence, uses terminology accurately;

4. illustrates theoretical provisions with concrete examples, applies them in a new situation, shows his/her point of view on the issue presented;

5. answers additional questions;

6. demonstrates the assimilation of previously studied related issues, the formation and sustainability of knowledge, abilities and skills in the field of business analytics.

The grade "good" is given if the graduate:

1. gives correct, generally complete answers to the questions of the ticket without errors of principle;

2. presents the material in general correctly, in a certain logical sequence, in most cases accurately uses the terminology;

3. understands in general the main intra- and interdisciplinary connections.

4. answers the main part of additional questions;

5. demonstrates the assimilation of previously studied related issues, the formation and sustainability of knowledge, skills and abilities in the field of business analytics.

But at the same time:

- cannot present and argue his/her position on the problem;
- can not confidently answer some questions;
- not all conclusions are evident and argumentative in the field of business analysis on the basis of the knowledge, skills and abilities.

A grade of "satisfactory" is given if:

- 1. the graduate's answers are mostly correct, without errors of principle, but incomplete, or inaccurate, incompletely or inconsistently disclosed the content of the questions of the ticket;
- 2. with a very confident answer to one of the questions, the answer to the other questions is very weak (at the level of definitions);
- 3. the graduate does not understand the intra- and interdisciplinary links;
- 4. the graduate, with a sufficient answer to the questions of the ticket, cannot answer the main part of the additional questions.
- 5. with incomplete knowledge of theoretical material the insufficiency of knowledge, skills and abilities is revealed.
- 6. The mark "unsatisfactory" is given if the graduate:
- 7. does not answer the questions of the ticket;
- 8. answers the questions of the questionnaire on the level of definitions, his answers contain errors of principle;
- 9. he/she gives an unsure answer to one of the questions, but does not answer to the others, or his/her answers contain errors of principle;
- 10.mistakes in the definition of concepts, in the use of terminology, which are not corrected after several leading questions, cannot answer additional questions;
- 11.knowledge, abilities and skills are not formed.
- 12.uses cribs in any form.

The total score for the final state exam is based on the marks received for the answers to each of the three questions of the ticket.

Decisions of the State Examination Commission are taken at a closed meeting by a simple majority vote of the commission members participating in the meeting, with the obligatory presence of the Chairman of the Commission or his deputy. If the number of votes is equal, the Chairman of the Commission (or the Deputy Chairman of the Commission) has a casting vote.

All decisions of the State Attestation and Examination Commissions shall be documented in the minutes of the meeting of the State Examination Commission, which shall record the discipline for which the exam is taken, the ticket number, the questions on the ticket, the level of the student's answers to them, and the grade, all signed by the chairman and members of the SEC.

# 5. Requirements for the defense of graduate qualification work, the procedure of preparation and defense of graduate qualification work

# 5.1. Requirements for the graduate qualification work

5.1.1 General requirements

1. The graduate qualification work (GQW) is an obligatory element of the educational program, a form of research, project work of a student; defense of graduate qualification work is an obligatory component of the SFC of the educational program in the field of 38.03.05 Business Informatics.

2. GQW is carried out in the form of a bachelor's thesis.

3. GQW is performed in accordance with the curriculum in the twelfth trimester.

4. GQW must represent an independent finished research on a given topic, written personally by the author under the guidance of the supervisor, indicating the author's ability to work with literature, summarize and analyze factual material, using theoretical knowledge and practical skills acquired during the mastering of the Bachelor's program of study. GQW may be based on the generalization of the results of the author's coursework and contain materials collected by him personally during the internship. The author of the work must refer in his graduate qualification work to the source of borrowing materials or any results.

5. The main objectives of the performance and defense of graduate qualification work are:

- systematization, deepening and integration of theoretical knowledge and practical skills in the chosen direction of training, their use to solve specific practical problems;
- development of the ability to critically evaluate and summarize theoretical positions;
- mastering of modern methods of research, generalization and logical presentation of the material;
- development of skills of independent analytical work;
- clarification of students' preparedness for practical work under market economy conditions;
- presentation of skills of public discussion and defense of the results of GQW, ability to make reasoned conclusions and recommendations.

6. The results obtained in GQW must have elements of scientific novelty and practical relevance. The totality of the results obtained in this work must indicate that its author has the skills of analytical, research or scientific-practical work in the chosen field of professional activity.

5.1.2 Stages of preparation of the graduate qualification work

The procedure for completing the graduate qualification work includes the following stages:

selection of the topic, determination of the structure and content, collection of materials, processing of information, design, examination, preparation of the report, defense of the graduate qualification work (the procedure for conducting and defense procedure) is regulated by the Regulations on the SFS of PGNRU graduates.

The bachelor's final qualifying work can be performed in the following formats:

- the format of research work (academic format);

- the format of the organizational and managerial / information technology solution project (project format);

- the format of the economic (financial and analytical) solution of the issue (consulting format);

- the "Startup as a diploma" format.

The requirements for the content, procedure for the implementation and protection of the bachelor's thesis, performed in academic, project, consulting formats, are set below by this GIA program for the educational program "...".

The requirements for the content, procedure for the implementation and protection of the WRC in the "Startup as a Diploma" format are uniform for all educational programs implemented at the Faculty of Economics of PSNIU, and are approved by the Academic Council of the Faculty of Economics in the form of regulations, which is a mandatory annex to this GIA program.

*Choice of the topic of the graduate qualification work* 

A list of research areas within which specific topics of qualification works can be formulated is given in **Appendix 3**. Using this list and his preferences, which appeared during the study, the student can choose the theme of work. The formulation of the topic must meet some general requirements:

- take into account the direction of training;

- be as concise as possible (no more than 6-7 words, without adjective sentences, participatory and derivative clauses, and introductory words);

- be problematic (aimed at performing some actions);

- be understandable and euphonious.

It should be remembered that the key words in the formulation of the topic represent those concepts to which the entire work is devoted, the remaining words give restrictive terms defining the field of research. From this we can conclude that the formulation of the topic should give a clear idea of the object and subject of the research. The object is that space within which the research is conducted, and the subject is that facet of the life of the object, which is subject to special study and, possibly, transformation.

When choosing a topic, a student should be guided, first of all, by his/her own interest, focusing on existing works performed during the period of study at the University (term papers, essays and abstracts - results of scientific research, materials of conferences, symposia, etc.) taking into account future professional activity.

The optimal option is to develop the problem of coursework.

It is preferable to choose a topic of a problematic nature. The originality of the topic also increases the overall grade of the work.

The topic of the work is agreed with the supervisor. On the 4th year the supervisor draws up for each student a task for a graduate qualification work (Appendix 5). It fixes the topic, determines the nature and timing of reporting. Change of these terms is allowed by joint agreement of the supervisor and the student, but no more than 10 days. The assignment is signed by the student, the supervisor and approved by the head of the department.

5.1.3 Requirements for the structure, content and design of the graduate qualification work

- 1. Scientific qualification work must have the following structure:
- title page;
- table of contents;
- introduction;
- main text (chapters, paragraphs);
- conclusion;
- list of references;
- appendices.

The title page is designed in accordance with Appendix 6.

The table of contents includes the names of sections and subsections of the work, indicating the pages. A sample table of contents is presented in Appendix 7.

The introduction should contain:

- justification for the choice of the topic, its relevance and scientific and practical significance;

- a list of the main developments on the topic:

- boundaries of the research (object, subject, theoretical, chronological and other frameworks);

- the purpose of the research and more specific research tasks arising from it;

- Characteristics of the sources used (4-5 main).

The volume of the introduction 3-5 pages.

**The main part** consists of 3 chapters. The title of the chapters should be brief, reflect the problem and not repeat the title of the work. The chapters are subdivided into paragraphs. The number of paragraphs is determined by the logic of the research and is not strictly regulated, however, too many paragraphs, implying the presentation of very narrow issues, is undesirable. The optimal number of paragraphs is 3. The titles of the paragraphs specify the title of the chapter, but do not repeat it. It should be remembered that each paragraph should not contain a description of the issue, but a certain problem, its analysis and solution (approaches in science or the author's).

**The first chapter** is theoretical. It reveals the essence of the problem stated by the author in the topic, the degree, directions of solution in science, as well as highlights the essence of private tasks necessary to solve the overall problem. The successes achieved in a specific, subject area are summarized. A detailed analysis of the legislative and regulatory framework, analyzes statistical data for the country, industry, region, other countries. The role and importance of the problem for the organization is considered. The author's attitude to this problem is substantiated. The general approaches to the solution of the set tasks are defined.

In this chapter, special attention should be paid to the review of the literature and other sources (monographs, articles, Internet sources) on the topic of research. Comparison of the positions of its most important researchers on the problem is mandatory. The author's attitude is shown and substantiated, the possibilities of this chapter as a methodological basis for subsequent practical research are outlined. Independence in the selection and analysis of sources is one of the most important conditions for high evaluation. The chapter ends with conclusions. The size of the theoretical chapter should be about 15-20 pages.

The following chapters present the characteristics of the object of research, the results of the research conducted, the rationale for the choice of research methods and techniques, the results of the analysis of the material collected, recommendations for the practical application of the results are given, and their effectiveness is justified.

The results of the analysis are the basis for making scientifically argued decisions on the merits of the problem. It is recommended to present the collected empirical material in the form of diagrams, schemes, tables for visual and convenient display of information. Each table or diagram is necessarily given with accompanying analysis and necessary comments. In addition, they must be properly designed with the name, units, and number. In order to get reliable conclusions on the results of the study, empirical and statistical data should be presented in the dynamics for several years.

It is necessary to adhere to scientific style of presentation, terminology accepted in this field, notations, abbreviations and symbols. Presentation of the material should be consistent and logical, be literate, literary language, without stylistic and logical errors. Particular attention should be paid to the presence of logical links in the transition between chapters and sections of the work.

In general, the graduate qualification work should represent a complete study of the chosen object.

The object of research in graduate qualification work can be enterprises, organizations, divisions, regions, public administration and social infrastructure, which should be considered as specific socio-economic systems of different scales, levels, spheres of action, forms of ownership, functioning and developing in specific conditions of market economy.

The volume of the remaining chapters is approximately 35-40 pages of typewritten text. General remarks on the main part:

- research and analysis of legislative and other normative acts, statistical materials by chapters is determined by the logic of the work;
- at the end of each chapter the conclusions are obligatory;
- all sections and paragraphs of the work should be commensurate both in content and volume.

**The conclusion** should contain brief conclusions on the whole work, the key points of the study with the allocation of the author's original approaches; the author's conclusions, practical recommendations. It should clearly trace the achievement and solution of the tasks set by the author in the introduction.

Approximate volume of the conclusion 3-5 pages.

The total volume of the graduate qualification work -60-75 pages of printed text (without appendices).

The list of references includes all sources that, in one way or another, used by the student in the preparation of the bachelor's work. Numbering of sources through sections. The list of references must be at least 30-40 sources.

**Appendixes** include auxiliary materials, or those that are difficult to place in the text of the work (large charts and tables, graphics, reference data, samples of primary documents, etc.). The appendix is referred to in the text of the work.

Graduate qualification work, which only sets out the material of textbooks, manuals or laws and regulations, is not allowed to defense and returned to the student for revision.

4. Formatting of the graduate qualification work.

Final qualifying work is made out on a white unlined paper A4 format (210x297mm) in hardcover (1 copy) and in electronic form. The hard cover must have a sticker, made in accordance with the requirements (Appendix 7). The text is typed on the computer and printed on the printer on one side of the sheet. Microsoft Word 2007 or higher should be used to prepare the electronic form.

Page parameters: top margin - 25 mm, bottom margin - 10 mm, left margin - 20 mm, right margin - 20 mm. The text is aligned by width, Times New Roman font. Typeface: normal. Size: 13. The red line: indent 1,25 mm. The interval between the lines: 1,5.

Page numbering is continuous in Arabic numerals, starting from the title page. Disable the number on the title page. The position of page numbering is at the bottom in the center of the page.

*Chapters* are numbered in Arabic numerals. *The paragraph number* consists of the chapter number and the serial number of the paragraph (Arabic numerals), separated by a dot. For example,

Chapter 1 Title of the chapter

Title of paragraph 1.1

Title of paragraph 1.2.

*Titles of chapters and paragraphs* should be typed with a capital letter without a dot at the end, without underlining. Transposition of words in headings is not allowed. If the title consists of two sentences, they are separated by a dot. Alignment of headings in the text of the work: to the center. The line with the title of the chapter (paragraph) from the line with the text is separated by one blank line. Each chapter, as well as the introduction, conclusion, list of references and appendices should begin with a new page.

The next page after the title page is the table of contents, which includes the numbers and names of chapters, paragraphs, sections and page numbers. The word "Table of contents" is written in the form of a title with a capital letter. Center alignment.

#### Rules for tables, figures, graphs

Tables and figures should be named and numbered sequentially, with the addition of the word Figure or Table before the name of the object, respectively, and its number in Arabic numerals. The font size is 12 pt. Numbering of figures and tables is allowed as continuous (Table 1, Table 2, etc.), and by chapters, in which case the number consists of the chapter number and serial number of the object separated by a point (Figure 1.1, Figure 2.3, etc.). The names of figures are placed below the figures in the center of the page, the names of tables - above the tables, alignment on the right side. All figures (tables) should be indicated in the text of the work. Figures (tables) should be placed in the work immediately after the text in which they are first mentioned, or on the next page. When figures (tables) are borrowed from any source, a reference to the source is given under the title.

#### Rules of formulas and equations writing

Formulas should be placed in the middle of the page or inside of text lines. It is recommended that formulas are short, simple, have no independent meaning and are not numbered in the text. The most important formulas, as well as long and cumbersome formulas are placed on separate lines and numbered throughout the work in Arabic numerals in parentheses in the rightmost position on the line. Separate numbering of formulas in each chapter is allowed, in which case the formula number consists of the chapter number and the sequence number of the formula separated by a dot. One blank line should be left above and below each formula or equation. Explanations of formula parameters are given immediately below the formula in the same sequence as they appear in the formula.

#### Rules for reference

References in the text to the serial numbers of formulas and equations are given in parentheses. In the graduate qualification work should be used references to all sources of literature. References are made in the form of square brackets after the text, which indicates: the source number in the reference list. When direct citations indicate the page from which the text is taken.

*The list of references* should include sources and literature used by the author in studying the topic and writing a scientific qualification work. Each source included in the list of references must have a reflection in the text of the scientific qualification work. Possible options for the location of the literature in the list:

– alphabetical;

– according to the types of documents.

The arrangement of the material in the lists is agreed with the supervisor.

*The alphabetic arrangement* of sources means that a strict word alphabet of bibliographic description titles (authors or titles) is maintained; separately an alphabetic row is arranged in Cyrillic (Russian, Bulgarian, etc.) and a row in languages with Latin lettering (English, French, German, etc.)

When arranged by *types of documents* the material in the list of literature is arranged first by types of publications: books, articles, official documents, standards, etc., and within the section by alphabetical order (author or title).

The list of references by type is included in the content of the work and is made out as a separate section at the end of the work. Different types of sources are separated by headings (normative legal acts, books, scientific articles, Internet resources, materials of the enterprise) within which are numbered in order with the number of subsection and serial number. Normative legal acts are arranged in accordance with their legal force:

- international legislative acts - in chronological order;

- Constitution of the Russian Federation;

- Codes - alphabetically;

- Laws of the Russian Federation - chronologically;

- Decrees of the President of the Russian Federation - chronologically;

- Acts of the Government of the Russian Federation - chronologically;

- Acts of ministries and departments in a sequence - orders, resolutions, regulations, instructions of the ministry - alphabetically, acts - chronologically.

#### Rules for Appendices

Materials supplementing the text of the graduate qualification work, it is allowed to place in Appendices. *Appendices* are designed as a continuation of the following pages. Appendices are placed in the order of their references in the text of the graduate qualification work. Each appendix should begin with a new page with the word "Appendix" and its designation at the top right. The appendix must have a title. Alignment of the title: from the center. Appendixes are numbered sequentially in Arabic numerals.

The text of the graduate qualification work is set out in the third person, it does not use the pronouns "I", "we".

Expressions such as "last year", "this year", "at the present time" should be avoided and specify the month, year.

The date of adoption of the document should be written in the following order date, month, year. The number of the document should be written after the date of adoption. It is not allowed to abbreviate words in the title of the document, except for common abbreviations. Text should not be overloaded with special terms and abbreviations that make reading difficult.

5.1.4 Examination of graduate qualification work

After submitting the finished graduate qualification work, the supervisor conducts an examination in accordance with the normative control sheet (Appendix 4).

Two days before the defense, the supervisor submits a review of the student's final qualifying work. A sample review is presented in Appendix 12. The review should reflect:

- the degree of compliance of the completed work with the approved topic;

- the relevance of the research topic, argumentation;
- the degree of independence of the student in the choice of topic, the development of the plan, in the selection of literature and other sources;
- completeness of the presentation of approaches to solving problems;
- correspondence of the chosen methods to the set tasks, correctness of the research,

reliability of the obtained results and correctness of their interpretation;

- compliance of the goal and objectives of the work, compliance of the formulated results and conclusions with the goal and objectives of the the thesis;
- the logic of the presentation of the topic, the relationship between the theoretical and practical chapters of the work;
- ability to work with literature and other sources, ability to analyze sources and draw conclusions;
- correspondence of the graduate qualification work to the requirements for its design;
- the readiness of the student for professional activities in accordance with the SEES of PSNRU.
- the degree of student's responsibility in relation to the work, the ability to organize his/her work, compliance with the deadlines for its discussion and execution, as stipulated in the assignment;
- presence of publications, presentation of the reports on the topics of the graduate qualification work at the students' scientific conferences;
- additional notes;
- the degree of formation of general cultural, professional and professional competencies of the author of the graduate qualification work, provided by PSNRU SEES;
- the conclusion about the admission;
- whether the graduate deserves the "Bachelor" qualification.

# **5.2 Preparation and defense of the graduate qualification work**

1. The defense of the graduate qualification work is carried out in accordance with the curriculum.

2. One week before the defense, the Department of Information Systems and Mathematical Methods in Economics publishes an announcement about the schedule of the SEC and the schedule of students' defense (with the names of graduates). Sessions of the SEC for the defense of bachelor's papers are planned for several days on the basis, as a rule, not more than 16 defenses at one meeting. Changes in the order of defense are possible in exceptional cases.

3. The following documents are submitted for the defense:

- the text of the graduate qualifying work (signed by the graduate, the supervisor and the head of the department) in hardcover (1 copy), and in electronic form (sent by e-mail to the secretary of the SEC for verification in the Anti-Plagiarism system);

- task for the graduate qualification work (signed by the graduate, the supervisor and the head of the department);

- reference of the supervisor;

- normative control sheet.

Complete documentation is submitted to the head of the department for signature no later than two days before the official deadline for protection.

A student who fails to submit the required documents on time will not be allowed to defend his or her final qualifying work.

4. If the supervisor's review is negative, the graduate may be admitted to the defense only by decision of the head of the department.

5. The grounds for not admitting a graduate qualification paper to the defense:

- absence of the task signed by the graduate, the academic supervisor and approved by the head of the department;

- the absence on the day of defense signed by the supervisor and the head of the department on the title page of the graduate qualifying work;

- change of the theme of the graduation qualification work or change of the supervisor without approval at the meeting of the department;

- non-compliance with the terms of the intermediate report, reflected in the task (as presented by the supervisor);

- unsatisfactory evaluation of a graduation thesis by the supervisor. In this case, the final decision belongs to the head of the department, who can act as a reviewer himself or involve a teacher (specialist) whose scientific qualification is not less than the scientific qualification of the supervisor.

In agreement with the supervisor of the graduate qualification work, the student prepares:

- a report before the State Attestation Commission;
- materials of a computer presentation of the graduate qualification work.

Assignment for graduate qualifying work, written review of the supervisor is placed in a separate file, which is attached to the graduate qualification work.

Materials of computer presentation of graduate qualification work at the defense are considered not only and not so much as just an illustration material, but, above all, as a visual demonstration of the student's ability to structure the problem posed in the project and logically consistently present their version of its solution.

The decision of the State Attestation Commission on the evaluation of the graduate qualification work is made at a closed meeting and announced to the students and those present at the defense. Defended graduate qualification work with the supervisor's review shall be submitted to the department, where they are stored in the prescribed manner.

Final qualifying work is defended at the meeting of the State Certification Commission. The Chairman of the State Certification Commission is approved from among persons not working at the given Faculty of Economics, having the degree of doctor of science and (or) the academic title of professor or being leading specialists representatives of employers or their associations in the field of professional activity.

The report of the graduate during the defense should not exceed 10 minutes. The report reflects the relevance of the topic, the object of research, its goals and objectives, gives a brief description of the content of the work, shows the achieved results, emphasizes the novelty and the author's approach. Use of demonstration materials made in presentation format is obligatory. The content of the report and demonstration material must necessarily be agreed with the supervisor.

After the performance the student must answer the questions asked by the members of the SEC, as well as the teachers and students present at the defense. After reading the supervisor's feedback, the student is given the opportunity to respond to the comments contained therein.

# 6. Funds of assessment tools for the defense of graduate qualification work

### 6.1 Planned learning outcomes for testing competencies and their assessment criteria

6.1.1 Planned learning outcomes for testing the universal competences and criteria of their evaluation

Compete	Competency		Criteria and in	dicators of assessment	of learning outcomes ar	nd competence level			
ncy codes	name	Learning outcomes	Insufficient	Threshold	Basic	High			
UC.1 Is ab	UC.1 Is able to search, analyze and synthesize information, apply a systematic approach to solve problem situations								
UC.1.2	Works with	To know the rules	Does not know how	Finds information	Knows how	Knows how to			
	conflicting	and ways of	to evaluate	according to criteria	contradictory	independently select			
	information	selecting the	conflicting	formulated by the	information is	criteria by which			
	from	necessary	information in terms	teacher.	analyzed according to	usefulness (reliability) is			
	different	information, its	of usefulness	Maintains search	given criteria, can	evaluated, can evaluate			
	sources, finds	further processing	(reliability);	results by organizing	offer own criteria,	by a complex			
	gaps in the	in accordance with	Does not know how	information using	tries to re-structure	(combined) criterion			
	information	the tasks of the	to find gaps in	standard methods	information for	Finds information			
	needed to	thesis;	information.	(e.g., cataloging).	analysis	according to criteria			
	solve the	To be able to find	Does not know how	Uses a limited	Can evaluate	independently chosen			
	problem,	and correctly	to use information	number of	contradictory	according to the task at			
	identifies	process	sources	information	information according	hand			
	options to	contradictory	Does not know how	sources when	to the criteria of	Saves the results of			
	address the	information,	to analyze	searching (not	usefulness (reliability)	information retrieval			
	gaps	eliminating gaps in	information for gaps	only electronic	set by the teacher, in	using complex systems,			
		it that prevent to	according to given	information	general eliminating	may be his or her own			
		solve the problems	criteria.	systems), partially	the gaps that interfere	Uses a large number of			
		related to the thesis.		identifies gaps in	with the solution of	different sources of			
		To be able to find		information and	the problems in the	information, not only in			

UC.1.3	Analyzes the	and process information to solve the problems of the thesis, identifying options to eliminate gaps. To know the	Does not know the	options for filling gaps. Partially knows the	thesis. Knows how to critically evaluate information. Chooses independently the ways of analysis of information, for this purpose can conduct structuring (ordering) of the information from the offered ones.	professional, but also in related fields, to fill gaps Chooses independently ways to analyze information, structures (arranges) information to fill in information gaps. Can compare them with each other and choose the best one or a combination of them
UC.1.3	Analyzes the problem situation as a system, identifying its components and the connections between them	To know the methodology of systems analysis for the study of problems in the GQW; To be able to identify the structure of the problem for its analysis; To be able to apply the methodology of system analysis to study the problems of the thesis; To be able to apply the methodology of system analysis to study the problems	Does not know the methodology of systems analysis for the study of problems in the GQW; Does not know how to identify the structure of the problem for its analysis; Does not have the ability to apply the methodology of system analysis to study the problems of the thesis	Partially knows the methodology of systems analysis for the study of problems in the GQW; Fragmentary knows how to identify the structure of the problem for its analysis; Partially knows the ability to apply the methodology of systems analysis to study the problems of the thesis	In general, with some gaps, knows the methodology of systems analysis for the study of problems in the GQW; Generally able to identify the structure of the problem for its analysis; With a few gaps is able to apply the methodology of systems analysis to research problems in the thesis	Knows the methodology of systems analysis for the study of problems in the GQW; Will be able to identify the structure of the problem for its analysis; Knows how to apply the methodology of system analysis to study the problems of the thesis

		of the thesis				
UC 2 Is a	ble to determine	the range of tasks with	hin the set goal and cl	hoose the ways of thei	r solution based on the	available resources and
UC.2 Is a limitation		the range of tasks with	hin the set goal and cl	hoose the ways of thei	r solution, based on the	e available resources and
		the range of tasks with	hin the set goal and cl	hoose the ways of thei	r solution, based on the	e available resources and
limitation	s				_	
	<b>s</b> Formulates	To know the basic	Does not know the	Does not	In general, with	He/she knows the
limitation	<b>s</b> Formulates	To know the basic principles of goal-			_	
limitation	s Formulates tasks based	To know the basic	Does not know the basic principles of	Does not confidently know	In general, with some gaps, knows	He/she knows the principles of goal-
limitation	s Formulates tasks based on the set	To know the basic principles of goal- setting, principles of problem-setting depending on the	Does not know the basic principles of goal-setting, principles of problem-setting	Does not confidently know the basic principles of goal- setting, principles	In general, with some gaps, knows the basic principles of goal-setting, principles of setting	He/she knows the principles of goal- setting, principles of problem-setting depending on the goal
limitation	s Formulates tasks based on the set	To know the basic principles of goal- setting, principles of problem-setting depending on the goal within the	Does not know the basic principles of goal-setting, principles of problem-setting depending on the	Does not confidently know the basic principles of goal- setting, principles of setting tasks	In general, with some gaps, knows the basic principles of goal-setting, principles of setting tasks depending on	He/she knows the principles of goal- setting, principles of problem-setting depending on the goal within the selected
limitation	s Formulates tasks based on the set	To know the basic principles of goal- setting, principles of problem-setting depending on the goal within the chosen topic of the	Does not know the basic principles of goal-setting, principles of problem-setting depending on the goal within the	Does not confidently know the basic principles of goal- setting, principles of setting tasks depending on the	In general, with some gaps, knows the basic principles of goal-setting, principles of setting tasks depending on the goal within the	He/she knows the principles of goal- setting, principles of problem-setting depending on the goal within the selected topic of the thesis;
limitation	s Formulates tasks based on the set	To know the basic principles of goal- setting, principles of problem-setting depending on the goal within the chosen topic of the the thesis;	Does not know the basic principles of goal-setting, principles of problem-setting depending on the goal within the selected topic of	Does not confidently know the basic principles of goal- setting, principles of setting tasks depending on the goal within the	In general, with some gaps, knows the basic principles of goal-setting, principles of setting tasks depending on the goal within the selected topic of the	He/she knows the principles of goal- setting, principles of problem-setting depending on the goal within the selected topic of the thesis; The ability to define
limitation	s Formulates tasks based on the set	To know the basic principles of goal- setting, principles of problem-setting depending on the goal within the chosen topic of the the thesis; To be able to define	Does not know the basic principles of goal-setting, principles of problem-setting depending on the goal within the selected topic of the thesis;	Does not confidently know the basic principles of goal- setting, principles of setting tasks depending on the goal within the selected topic of	In general, with some gaps, knows the basic principles of goal-setting, principles of setting tasks depending on the goal within the selected topic of the the thesis;	He/she knows the principles of goal- setting, principles of problem-setting depending on the goal within the selected topic of the thesis; The ability to define tasks based on the
limitation	s Formulates tasks based on the set	To know the basic principles of goal- setting, principles of problem-setting depending on the goal within the chosen topic of the the thesis; To be able to define tasks based on the	Does not know the basic principles of goal-setting, principles of problem-setting depending on the goal within the selected topic of the thesis; No skills and no	Does not confidently know the basic principles of goal- setting, principles of setting tasks depending on the goal within the selected topic of the thesis;	In general, with some gaps, knows the basic principles of goal-setting, principles of setting tasks depending on the goal within the selected topic of the the thesis; In general, is able to	He/she knows the principles of goal- setting, principles of problem-setting depending on the goal within the selected topic of the thesis; The ability to define tasks based on the goal set in the thesis
limitation	s Formulates tasks based on the set	To know the basic principles of goal- setting, principles of problem-setting depending on the goal within the chosen topic of the the thesis; To be able to define tasks based on the goal set in the thesis	Does not know the basic principles of goal-setting, principles of problem-setting depending on the goal within the selected topic of the thesis;	Does not confidently know the basic principles of goal- setting, principles of setting tasks depending on the goal within the selected topic of the thesis; Partially knows	In general, with some gaps, knows the basic principles of goal-setting, principles of setting tasks depending on the goal within the selected topic of the the thesis; In general, is able to define tasks, based	He/she knows the principles of goal- setting, principles of problem-setting depending on the goal within the selected topic of the thesis; The ability to define tasks based on the
limitation	s Formulates tasks based on the set	To know the basic principles of goal- setting, principles of problem-setting depending on the goal within the chosen topic of the the thesis; To be able to define tasks based on the	Does not know the basic principles of goal-setting, principles of problem-setting depending on the goal within the selected topic of the thesis; No skills and no	Does not confidently know the basic principles of goal- setting, principles of setting tasks depending on the goal within the selected topic of the thesis;	In general, with some gaps, knows the basic principles of goal-setting, principles of setting tasks depending on the goal within the selected topic of the the thesis; In general, is able to	He/she knows the principles of goal- setting, principles of problem-setting depending on the goal within the selected topic of the thesis; The ability to define tasks based on the goal set in the thesis

		the selected ways of problem solving, based on the set goal		setting and principles of problem-setting depending on the goal and relevance of the thesis; Partially knows the skills to justify the selected ways of problem solving, based on the set goal.	relevance; In general, with a few gaps knows the skills to justify the selected ways of problem solving, based on the set goal.	justify the selected ways of problem solving, based on the set goal.
UC.2.3	Justifies the way of solving the problem, taking into account the available resources and limitations	To know the methods and models of justification and solution of the tasks set in the thesis, taking into account the available resources and limitations. To be able to apply methods and models of justification and solution of the tasks set in the graduate thesis, taking into account the available resources and limitations.	Does not know the methods and models of justification and solution of the tasks set in the thesis, taking into account the available resources and limitations. No skills and no abilities.	Partially knows the methods and models of justification and solution of the tasks set in the thesis, taking into account the available resources and limitations. Fragmentarily able to apply methods and models of justification and solution of tasks set in the thesis, taking into account available resources and	In general, knows well the methods and models of justification and solution of the tasks set in the thesis, taking into account the available resources and limitations. Good with some comments is able to apply the methods and models of justification and solution of the tasks set in the thesis, taking into account the available resources and	Excellent knowledge of methods and models of justification and solution of tasks set in the thesis, taking into account the available resources and limitations. Successfully able to apply methods and models of justification and solution of tasks set in the thesis, taking into account available resources and limitations. Excellent ability to apply methods and models of justification

		To master the ability to apply methods and models of justification and solution of tasks set in the thesis, taking into account the available resources and limitations.		limitations. Partially has the ability to apply methods and models of justification and solution of tasks set in the thesis, taking into account available resources and limitations.	limitations. Generally well able to apply the methods and models of justification and solution of the tasks set in the thesis, taking into account available resources and limitations.	and solution of tasks set in the thesis, taking into account available resources and constraints.
UC.4 Is at	ble to carry out b	usiness communication	in Russian and a forei	gn language in oral ar	nd written forms	
UC.4.2	Translates texts from foreign language into Russian and from Russian into foreign language	To know the methods and rules of translation of texts from a foreign language into Russian and vice versa, necessary for the performance and defense of the thesis, preparation of the report, presentation and answers to additional questions.	Does not know the methods, rules of translation of texts from a foreign language into Russian and vice versa, necessary to perform and defend the thesis, prepare the report, presentation and answers to additional questions. No skills and no abilities.	Fragmentary knowledge of the methods and rules of translation of texts from a foreign language into Russian and vice versa, necessary to perform and defend the thesis, to prepare the report, presentation and answers to	Insufficiently confidently knows the methods and rules of translation of texts from a foreign language into Russian and vice versa, necessary to perform and defend the thesis, to prepare the report, presentation and answers to additional	The student has an excellent knowledge of the methods and rules of translation of texts from a foreign language into Russian and vice versa, necessary for the execution and defense of the thesis, preparation of the report, presentation and answers to additional questions. Fully able to show

	To be able to show	additional	questions.	knowledge of foreign
	anowledge of	questions.	During the	literature on the topic
	oreign literature on	Partially able to	preparation and	of the thesis during
	he topic of the	show knowledge	defense of the thesis	the preparation and
th	hesis during the	of foreign	he/she can show	defense of the thesis;
p	preparation and	literature on the	knowledge of	translating texts from
d	lefense of the	topic of the the	foreign literature on	foreign language into
th	hesis; to translate	thesis during the	the topic of the	Russian and can
te	exts from a foreign	preparation and	thesis; translating	translate the abstract
18	anguage into	defense of the	texts from a foreign	from Russian into a
R	Russian, and to be	thesis; translating	language into	foreign language. At
a	ble to translate the	texts from foreign	Russian, and in	the excellent level
te	ext of the abstract	language into	general with some	owns the skills of
fi	rom Russian into a	Russian, and	difficulties can	communication with
fe	oreign language.	satisfactorily able	translate the	the head of the thesis,
T	To be able to	to translate the	abstract from	with the members of
С	communicate with	text of the abstract	Russian into a	the SEC on the topic
th	he head of the	from Russian into	foreign language. In	of the thesis, using
th	hesis, with the	a foreign	general, at a good	professional
n	nembers of the	language. Partially	level, he/she knows	terminology,
S	SEC on the topic of	knows the skills of	how to	translating the
tł	he thesis, using	communication	communicate with	necessary texts
p	professional	with the head of	the head of the	(words) from a
te	erminology,	the thesis, with the	thesis, with the	foreign language into
tr	ranslating texts	members of the	members of the	Russian and vice
fi	rom a foreign	SEC on the topic	SEC on the topic of	versa.
14	anguage into	of the thesis, using	the thesis, using	
R	Russian and vice	professional	professional	
v	versa.	terminology,	terminology,	
		translating the	translating the	
		necessary texts	necessary texts	
		(words) from a	(words) from a	

				foreign language into Russian and vice versa.	foreign language into Russian and vice versa.	
UC.4.3	Presents the results of activities at public events orally and in writing.	To know the methods of business communication (in Russian and, if necessary, in a foreign language), necessary to present the results of the thesis, to prepare the report, presentation and answers to additional questions. During the preparation and defense of the thesis, be able to reasonably and competently build oral and written	Does not know the methods of business communication (in Russian and, if necessary, in a foreign language), necessary to present the results of the graduate thesis, prepare the report, presentation and answers to additional questions. No skills and no abilities.	Partially knows the methods of business communication (in Russian and, if necessary, in a foreign language), necessary to present the results of the thesis, to prepare the report, presentation and answers to additional questions. During the preparation and defense of the thesis he/she can reasonably and competently build	At a good level knows the methods of business communication (in Russian and, if necessary, in a foreign language), necessary to present the results of the thesis, to prepare the report, presentation and answers to additional questions. During the preparation and defense of the thesis he/she is not confident enough able to reasonably	The skill knows the methods of business communication necessary to perform and defend the thesis, to prepare a report, presentation and answer additional questions. High level of proficiency in free communication with the members of the State Examination Commission on the topic of the Master's thesis, using professional terminology.

		speech in Russian (if necessary, foreign language), conduct a harmonious dialogue, competently prepare the report and presentation; To master the skills of free communication with the head of the thesis, with the		oral and written speech in Russian (if necessary, in a foreign language), conduct a harmonious dialogue, competently prepare the report and presentation; Satisfactory skills of free communication with the members	and competently build oral and written speech in Russian (if necessary foreign language), to conduct a harmonious dialogue, competently prepare the report and presentation; at a good level shows the skills of	
		with the head of the		communication	at a good level	
		of the thesis, using professional terminology		thesis, with the use of professional terminology.	of the SEC on the subject of the thesis, using professional terminology.	
UC.5 Able	to perceive the	intercultural diversity o	f society in socio-histo	rical and philosophica	l contexts	
UC.5.3	Accepts social, ethical, religious, and cultural	Is aware of social, ethical, confessional and cultural differences and is able to apply them for	Does not know social, ethical, confessional and cultural differences and is not able to	Not confidently knows social, ethical, confessional and cultural differences and	In general, confidently knows social, ethical, religious and cultural differences and in general is able to	Confidently aware of social, ethical, religious and cultural differences and confidently able to apply them to a
	differences	competent and reasoned response to the questions of the examination ticket, is	apply them to a competent and reasoned response to	fragmentally able to apply them to a	apply them to a competent and reasoned response to	competent and reasoned response to the questions of the examination ticket, is able, if

		able, if necessary, with knowledge of social, ethical, confessional and cultural differences, to answer additional questions of the examiners.	examination ticket, not having knowledge of social, ethical, confessional and cultural differences, can not answer additional questions from the examiners	the questions of the examination ticket, partially able, if necessary, having knowledge of social, ethical, confessional and cultural differences, to answer additional questions of the examiners.	examination ticket, with small gaps can, if necessary, with knowledge of social, ethical, religious and cultural differences, to answer additional questions of the examiners.	necessary, with knowledge of social, ethical, religious and cultural differences, to answer additional questions of the examiners.
UC.6 Can UC.6.1	manage his reso	ources, build and implen	nent a trajectory of sel	f-development General	Insufficiently	Ha/sha knows the wave
UC.6.1	Assesses ms	assess the self-	to assess self-	unstructured	Insufficiently confident in	He/she knows the ways of self-organization and
	resources	organization and	organization and	knowledge of	knowing the ways	self-development (own
	(time,	self-development	self-development	ways to assess	of self-organization	resources) of his/her
	personal,	(own resources) of	(own resources) of	self-organization	and self-	professional level and
	psychological	their professional	their professional	and self-	development (own	skills;
	)	level and skills in	level and skills.	development (own	resources) of his/her	The ability to critically
		the preparation and	Does not know how	resources) of their	professional level	assess their own
		defense of the	to assess the	professional level	and skills; In	resources: professional
		thesis;	resource provision,	and skills in the	general, the ability	level of their own thesis,
		To be able to	justify the need for	preparation and	to critically assess	adequately perceive and
		critically assess the	resources to solve	defense of the	the professional	take into account the
		professional level of	the tasks of the SEC.	thesis;	level of his/her	comments of the head of
		his/her thesis,	No skills.	Partially able to	thesis (own	the thesis and members
		adequately perceive		critically assess	resources), to	of the SEC, expressed
		and take into		the professional	adequately perceive	during the discussion of
		account the		level of his/her	and consider the	its content in the
		comments of the		thesis, adequately	comments of the	preparation and defense;

head of the thesis	perceive and take	head of the thesis	High level of skills to
and members of the	1	and members of	use their own creative
	into account the		
SEC, expressed	comments of the	SEC expressed	potential, own resources,
during the	head of the thesis	during the	which allow to prepare
discussion of its	and members of	discussion of its	and defend the thesis in
content in the	the SEC,	content in the	full accordance with the
preparation and	expressed during	preparation and	requirements of the
defense.	the discussion of	defense is formed;	requirements at a
Have the skills to	its content in the	In general, good	professionally high
use and assess their	preparation and	possession of the	level.
creative potential,	defense.	skills to use their	
allowing to prepare	Partially possesses	creative potential,	
and defend the	the skills to use	own resources,	
provisions of the	their creative	allowing to prepare	
thesis in full	potential, allowing	and defend the	
compliance with the	to prepare and	provisions of the	
requirements at a	defend the	thesis in full	
professionally high	provisions of the	compliance with the	
level.	thesis in full	requirements.	
	compliance with		
	the requirements.		

UC.6.2	Manages own	To know the	Does not know the	Partially knows the	Formed with some	Formed successful
	resources	peculiarities of own	features of own	peculiarities of	gaps knowledge of	knowledge of the
	(time	resource	resource	managing own	the features of own	features of own
	management,	management in the	management in the	resources in the	resources	resources management
	stress	preparation and	preparation and	preparation and	management in the	in the preparation and
	management,	defense of the	defense of the	defense of the	preparation and	defense of the thesis;
	self-	thesis;	thesis;	thesis;	defense of the thesis;	Fully able to assess
	presentation)	To be able to assess	Does not know how	At the satisfactory	In general with some	own resources, justify
	1 /	own resources,	to assess own	level can assess	gaps is able to assess	the need for resources
		justify the need for	resources, justify	own resources,	own resource	to solve the tasks
		resources to solve	the need for	justify the need for	provision, justify the	formulated in the
		the tasks formulated	resources to solve	resources to solve	need for resources to	thesis; plan the
		in the thesis; to plan	the tasks	the tasks	solve the tasks	necessary resources;
		the necessary	formulated in the	formulated in the	formulated in the	Successful possession of
		resources;	thesis; plan the	thesis; plan the	thesis; plan the	the skills of modern
		To master the skills	necessary	necessary	necessary resources;	planning, self-
		of modern planning,	resources;	resources;	Successful, but with	presentation and
		self-presentation	Does not know the	Partially knows the	some gaps, the skills	implementation of
		and implementation	skills of modern	skills of modern	of modern planning,	activities in a stressful
		of activities in a	planning, self-	planning, self-	self-presentation and	situation.
		stressful situation.	presentation and	presentation and	implementation of	
			implementation of	implementation of	activities in a stressful	
			activities in a	activities in a	situation.	
			stressful situation.	stressful situation.		
UC.8 Is ab	ole to create and	l maintain safe living o	conditions in everyday	v life and professional	activities to preserve t	he natural environment,
ensure the	sustainable dev	elopment of society, inc	luding the threat and o	emergence of emergen	cies and military conflic	ts
			1	1	1	
UC.8.1	Analyzes the	To know the basic	Does not know the	Partially knows	In general, with	Comprehensive
	factors of	concepts, terms,	basic concepts,	the basic concepts,	minor gaps knows	systematic knowledge
	harmful	definitions of the	terms, definitions	terms, definitions	the basic concepts,	of the basic concepts,
	effects on the	science of life	of the science of	of the science of	terms, definitions of	knows the terms,
	elements of	safety, legislative	life safety,	life safety,	the science of life	definitions of the

	the	and legal acts in the	legislative and	legislative and	safety, legislative	science of life safety,
	environment	e	U	U		•
		field of safety and	legal acts in the	legal acts in the	and legal acts in the	legislative and legal
	(technical	environmental	field of safety and	field of safety and	field of safety and	acts in the field of
	means,	protection when it	environmental	environmental	environmental	safety and
	technological	is necessary to	protection when it	protection when it	protection when it is	environmental
	processes,	study the factors of	is necessary to	is necessary to	necessary to study	protection when it is
	materials,	harmful effects on	study the factors	study the factors	the factors of	necessary to study the
	buildings and	the vital activity of	of harmful effects	of harmful effects	harmful effects on	factors of harmful
	structures,	the elements of	on the vital	on the vital	the vital activity of	effects on the vital
	natural and	habitat within the	activity of the	activity of the	the elements of	activity of the
	social	preparation and	elements of	elements of	habitat within the	elements of habitat
	phenomena)	defense of the the	habitat within the	habitat within the	preparation and	within the preparation
	_	thesis;	preparation and	preparation and	defense of the the	and defense of the the
		To be able to	protection of the	defense of the the	thesis;	thesis;
		analyze the hazards	the thesis;	thesis;	In general, with	Fully able to analyze
		of the technosphere,	No skills and no	Partially able to	some minor	the hazards of the
		to conduct	abilities.	analyze the	inaccuracies can	technosphere, conduct
		qualitative and		hazards of the	analyze the hazards	qualitative and
		quantitative		technosphere,	of the technosphere,	quantitative analysis
		analysis of hazards,		conduct	conduct qualitative	of hazards, numerical
		numerical analysis		qualitative and	and quantitative	analysis of risks when
		of risks when it is		quantitative	analysis of hazards,	it is necessary to study
		necessary to study		analysis of	numerical analysis	the factors of harmful
		the factors of		hazards, numerical	of risks when it is	effects on life activity
		harmful effects on		analysis of risks	necessary to study	within the preparation
		life activity within		when it is	the factors of	and protection of the
		the preparation and		necessary to study	harmful effects on	thesis;
		protection of the the		the factors of	life within the	Shows successful
		thesis;		harmful effects on	preparation and	possession of methods
		To master the		the vital activity	protection of the the	and technologies of
		methods and		within the	thesis;	protection in
		technologies of		preparation and	In general, with	emergency situations
L	I			reputation and	in Seneral, with	entergeneg situations.

		protection in emergencies.		protection of the thesis; In general, at a satisfactory level shows the possession of the methods and technologies of protection in emergency situations.	some tolerable inaccuracies shows the possession of methods and technologies of protection in emergency situations.	
UC.8.2	Identifies hazardous and harmful factors within the scope of the activity	To know the safety requirements of technical regulations within the framework of the activities for the preparation and defense of the thesis; To be able to identify the main hazards of human environment, assess the risk of their implementation, choose methods of protection from hazards in relation to their professional activities and ways	Does not know the safety requirements of technical regulations in the framework of the activities for the preparation and defense of the thesis; Does not know how to identify the main hazards of human environment, assess the risk of their implementation, choose methods of protection from	Partial knowledge of the safety requirements of technical regulations in the framework of the activities for the preparation and defense of the thesis; Partially able to identify the main hazards of human environment, assess the risk of their implementation, choose methods of protection from hazards in relation	In general, with some gaps knows the safety requirements of technical regulations within the framework of the activities for the preparation and defense of the thesis; In general, with minor gaps is able to identify the main hazards of human environment, assess the risk of their implementation, choose methods of protection from	Successfully mastered and knows the safety requirements of technical regulations within the framework of the activities for the preparation and defense of the graduate thesis; Successfully applies the ability to identify the main hazards of human environment, assess the risk of their implementation, choose methods of protection from hazards in relation to their professional activities and ways to

		to ensure comfortable conditions of life; Have the skills to solve problems of ensuring comfortable and safe conditions of life within the preparation and protection of the the thesis.	hazards in relation to their professional activities and ways to ensure comfortable conditions of life; Does not have the skills to solve problems of ensuring comfortable and safe conditions of life within the preparation and protection of the the thesis. Does not apply knowledge to solve professional problems.	to their professional activities and ways to ensure comfortable conditions of life; Fragmentary has the skills to solve the problems of ensuring comfortable and safe conditions of life within the preparation and protection of the the thesis. Partially observes the application of knowledge to solve professional problems.	hazards in relation to their professional activities and ways to ensure comfortable living conditions; In general, with minor gaps knows how to solve problems of ensuring comfortable and safe living conditions in the preparation and protection of the the thesis.	ensure comfortable conditions of life; Has the skills to solve problems of ensuring comfortable and safe conditions of life within the preparation and protection of the the thesis.
UC.8.4	Explains the	To know the basic	Does not know the	Partially knows	In general, knows	Demonstrates
	rules of	rules of behavior in	basic rules of	the basic rules of	the basic rules of	comprehensive
	conduct in	emergencies and	behavior in	behavior in	behavior in	knowledge of the
	emergencies	military conflicts;	emergencies and	emergencies and	emergencies and	basic rules of conduct
	(emergencies	To be able to	military conflicts;	military conflicts;	military conflicts;	in emergencies and
	) and military	explain the rules of	Is not able to	Partially able to	In general, is able to	military conflicts;
	conflicts;	conduct in	explain the rules	explain the rules	explain the rules of	Fully able to explain
	provides first	emergencies	of conduct in	of conduct in	conduct in	the rules of conduct in
	aid, describes	(emergencies) and	emergencies (ES)	emergencies	emergencies (ES)	emergencies
	how to	military conflicts; to	and military	(emergencies) and	and military	(emergencies) and
	participate in	explain the basic	conflicts; explain	military conflicts;	conflicts; explain	military conflicts;

	recovery activities	methods of safety organization, to outline ways to participate in recovery activities; To know the methods and techniques of first aid, methods of protection in emergencies.	the basic methods of safety organization, outline ways to participate in recovery activities; Does not know the methods and techniques of first aid, methods of protection in emergencies.	explain the basic methods of organizing safety, outline ways of participation in recovery activities; Fragmentary knows the methods and techniques of first aid, methods of protection in emergencies.	the basic methods of safety organization, outline ways to participate in recovery activities; In general, knows the methods and techniques of first aid, methods of protection in emergencies.	explain the basic methods of safety organization, outline ways to participate in recovery activities; In general, sustainably owns the methods and techniques of first aid, methods of protection in emergencies.
UC.9.1	Is oriented in the legal principles and norms in different spheres of life and the consequences of their violation.	Know the basic legal principles and norms used in the future profession and the consequences of their violation; Be able to apply the basic legal principles and norms in the process of writing and defending the thesis; Have the skills to familiarize with the basic principles and norms in different spheres of	Does not know the basic legal principles and norms used in the future profession and the consequences of their violation; Does not know how to apply basic legal principles and norms during the writing and defense of the thesis; Does not have the skills to become	-	In general, with minor inaccuracies knows the basic legal principles and norms used in the future profession and the consequences of their violation; In general, is able to apply the basic legal principles and norms during the writing and defense of the thesis; At a good level knows the skills of familiarization with	In general, at a high level knows the basic legal principles and norms used in the future profession and the consequences of their violation; Surely able to apply basic legal principles and norms during the writing and defense of the thesis; At a high level knows the skills of familiarization with the basic principles and norms in various

		life and the	principles and norms	basic principles and	the basic principles	spheres of life and the
		consequences of their	in various spheres of	norms in various	and norms in various	consequences of their
		violation	life and the	spheres of life and	spheres of life	violation
			consequences of	the consequences of	activities and the	
			their violation	their violation	consequences of their	
					violation	
UC.9.2	Orientates in	Knows the ethical	Does not know the	Partial knowledge	Generally oriented	Is confident in knowing
	ethical norms	norms of behavior in	ethical standards of	of ethical	and aware of the	the ethical norms of
	of behavior	the defense of the	behavior in the	standards of	ethical standards of	behavior during the
	in different	thesis;	defense of the thesis;	behavior in the	behavior in the	defense of the thesis;
	types of	Can navigate the	does not know how	defense of the	defense of the thesis;	Can navigate the ethical
	professional	ethical standards of	to navigate the	thesis; partially	Generally formed	standards of behavior in
	activity and	behavior in their	ethical standards of	formed ability to	ability to navigate the	their professional
	the	professional activities	behavior in their	navigate in the	ethical standards of	activities and the
	consequences	and the consequences	professional	ethical standards	behavior in their	consequences of their
	of their	of their violation	activities and the	of behavior in	professional activities	violation
	violation		consequences of	their professional	and the consequences	
			their violation	activities and the	of their violation	
				consequences of		
				their violation		
UC.10 Able	e to use basic de	efectological knowledge	in social and professio	nal spheres		
UC.10.1	Takes into	To know the psycho-	Does not know the	Partially knows the	In general, knows the	Fully knows the psycho-
	account the	physiological features	psycho-	psycho-	psycho-physiological	physiological features of
	psycho-	of the development of	physiological	physiological	features of the	the development of
	physiological	persons with	features of the	features of the	development of	persons with disabilities;
	features of	disabilities;	development of	development of	persons with	Fully able to take into
	the	To be able to take into	persons with	persons with	disabilities;	account the psycho-
	development	account the psycho-	disabilities;	disabilities;	In general, is able to	physiological features of
	of persons	physiological features	Does not know how	To a certain extent	take into account the	the development of
	with	of the development of	to take into account	can take into account	psycho-physiological	persons with disabilities

	disabilities in the process of social interaction	persons with disabilities in the process of social interaction; To master the skill of social interaction with persons with disabilities and impairments	the psycho- physiological features of the development of persons with disabilities in the process of social interaction; Does not know the skill of social interaction with persons with disabilities	psycho- physiological features of the development of persons with disabilities in the process of social interaction; Fragmentarily knows the skill of social interaction with persons with disabilities and impairments	features of the development of persons with disabilities in the process of social interaction; Generally knows the skill of social interaction with persons with disabilities and impairments	in the process of social interaction; Knows the skill of social interaction with persons with disabilities and impairments
UC.10.2	Demonstrates a tolerant attitude toward persons with disabilities and disabilities	Can show a tolerant attitude to persons with disabilities; Knows the skill of tolerant attitude to persons with disabilities and persons with disabilities	Does not know how to show a tolerant attitude towards persons with disabilities; Does not know the skill of tolerant attitude to persons with disabilities and persons with disabilities	Partially knows how to show a tolerant attitude towards persons with disabilities; Partially possesses the skill of tolerant attitude to persons with disabilities and persons with disabilities	Generally able to show a tolerant attitude towards persons with disabilities; Generally knows the skill of tolerant attitudes toward persons with disabilities	Fully knows how to show a tolerant attitude towards persons with disabilities; Fully possesses the skill of tolerant attitude to persons with disabilities and persons with disabilities
UC.10.3	Builds professional interaction with individuals	Is able to build professional interaction with persons with psychophysiological	Does not know how to build professional interaction with people with psychophysiological	Partially knows how to build professional interaction with people with psychophysiological	In general, with some inaccuracies, is able to build professional interaction with persons with	professional interaction with persons with psychophysiological

psychophysic logical features, taking int account nosology	Knows how to build professional	features, taking into account nosology; Does not know how to build professional interaction with people with psychophysiological features, taking into	account nosology; Partially knows how to build professional interaction with people with psychophysiological	psychophysiological features, taking into account nosology; In general, has the skill to build professional interaction with people with	build professional interaction with people with psychophysiological features, taking into
	account nosology	account nosology	account nosology	psychophysiological features, taking into account nosology	account nosology
UC.12 Is able to form an	intolerant attitude towar	ds corrupt behavior			
UC.12.1 Identifies th main feature and regulators of corrupt	s principles and norms that form the main	Does not know the basic legal principles and norms that form the main features and regulators of	the basic legal principles and norms	In most cases, knows the basic legal principles and norms that form the main features and regulators	Fully knows and understands the basic legal principles and norms that form the main attributes and

UC.13.1	Defines the	Knows the structure	Does not know the	Knows at the initial	Knows at a good level	Knows at an excellent
	<mark>main signs of</mark>	and content of	structure and content	level the structure	the structure and	level the structure and
	extremist and	documents and reports	of documents and	and content of	content of documents	content of documents
	terrorist	in the field	reports in the field of	documents and	and reports in the field	and reports in the field
	activity	of extremism	<mark>extremism</mark>	reports in the field	of prevention of	of prevention of
		prevention	prevention	of prevention of	<mark>extremism</mark>	<mark>extremism</mark>
		Be able to define and	Does not know how	<mark>extremism</mark>	He is able to define	He is able to define and
		present their position	to define and	He is able to define	<mark>and explain his</mark>	<mark>explain his position in</mark>
		<mark>in the field of</mark>	argumentatively	<mark>and explain his</mark>	position in the field of	the field of psychology
		psychology of	state his position in	position in the field	psychology of	of extremism and
		extremism and	<mark>the field of</mark>	<mark>of psychology of</mark>	extremism and	counterargument to the
		counterargument to	psychology of	<mark>extremism and</mark>	counterargument to	<mark>ideas of violence in</mark>
		the ideas of violence	extremism and	<mark>counterargument to</mark>	the ideas of violence	program and reporting
		<mark>in program and</mark>	counterargument to		<mark>in program and</mark>	documents at an
		reporting documents	the ideas of violence	<mark>in program and</mark>	reporting documents	excellent level.
		in a reasoned manner.	<mark>in program and</mark>		at a good level.	Has excellent skills in
		He has the skills to	reporting documents.	at the initial level.	Has a good level of	creating and
		create and	Does not have the	Possesses at the	skills in creating and	systematizing normative
		<mark>systematize normative</mark>	skills to create and	initial level the skills	systematizing	documents and
		documents and	<mark>systematize</mark>	of creating and	normative	<mark>programs for the</mark>
		programs for the	normative	<mark>systematizing</mark>	documents and	prevention of extremism
		prevention of	documents and	normative	programs for the	<mark>in oral</mark>
		<mark>extremism in oral</mark>	programs for the	documents and	prevention of	<mark>and written form,</mark>
		and written form,	prevention of	<mark>programs for the</mark>	extremism in oral	processing
		to prepare documents	<mark>extremism in oral</mark>	prevention of	and written form,	documents based on the
		based on the results	and written form,	extremism in oral	processing	results
		of monitoring the	document processing	and written form,	documents based on	of monitoring the
		radicalization and	based on the results	processing	the results	radicalization and
		deradicalization of	of monitoring the	documents based on	<mark>of monitoring the</mark>	deradicalization of
		young people	radicalization and	the results	radicalization and	young people
			deradicalization of	of monitoring the	deradicalization of	
			young people	radicalization and	young people	

				deradicalization of		
				young people		
UC.13.2	Identifies	Know some of the	Does not know some	Knows at the initial	Knows at a good level	Knows at an excellent
	information	<mark>current legal norms</mark>	of the current legal	level the current		
	<mark>calling for</mark>	that ensure the fight	norms that ensure	<mark>legal norms that</mark>	norms that ensure the	
	extremist and	<mark>against extremist</mark>	the fight against	ensure the fight	fight against extremist	<mark>fight against extremist</mark>
	terrorist	activities and	extremist activity	against extremist	activity and corruption	activity and corruption
	activities	corruption in various	and corruption in	activity and	in various spheres of	in various spheres of
		<mark>areas of life; ways to</mark>	various spheres of	corruption in various		life; ways to prevent
		prevent extremism	life; ways to prevent	spheres of life; ways	extremism and	extremism and
		and corruption and the	extremism and	to prevent extremism		corruption and the
		<mark>formation of an</mark>	corruption and the	and corruption and	<mark>formation of an</mark>	<mark>formation of an</mark>
		<mark>intolerant attitude</mark>	<mark>formation of an</mark>	the formation of an	intolerant attitude to	intolerant attitude to
		towards terrorism.	intolerant attitude to	intolerant attitude to	terrorism.	terrorism.
		Be able to analyze,	terrorism.	<mark>terrorism.</mark>	He is able to analyze,	He is able to analyze,
		interpret and correctly	Does not know how	<mark>Knows how to</mark>	interpret and correctly	interpret and correctly
		apply legal norms on	to analyze, interpret	analyze, interpret	apply legal norms on	<mark>apply legal norms on</mark>
		countering extremism	and correctly apply	and correctly apply	countering extremism	
		Possess skills of	<mark>legal norms on</mark>	<mark>legal norms on</mark>	at a good level	an excellent level
		working with	countering	countering	Possesses at a good	Has excellent skills of
		legislative and other	extremism	extremism at the	level the skills of	
		regulatory legal acts in	Does not have the	initial level	working with	and other regulatory
		the anti-corruption	<mark>skills to work with</mark>	Possesses at the	legislative and other	legal acts in the anti-
		sphere and the sphere	legislative and other			corruption sphere and
		of countering	regulatory legal acts	working with		
		<mark>extremism; skills of</mark>	in the anti-corruption			
		interaction in society		<mark>regulatory legal acts</mark>		
		based on an intolerant	· · · · · · · · · · · · · · · · · · ·	in the anti-corruption		<mark>based on an intolerant</mark>
		attitude to extremism,	extremism; the skills	L		· · · · · · · · · · · · · · · · · · ·
		terrorism and	of interaction in	sphere of countering	society based on an	terrorism and corruption

		corruption	society	extremism; skills of	intolerant attitude to	
			based on an	interaction in society	extremism, terrorism	
			intolerant	based on an	and corruption	
			attitude to	intolerant attitude to		
			extremism, terrorism	extremism, terrorism		
			and corruption	and corruption		
UC.13.3	Carries out	Knows the basics of	Does not know the	Knows at the initial	Knows at a good level	Knows at an excellent
	interaction on	current legislation,	<mark>current legal norms</mark>	level the current	the current legal	<mark>level the current legal</mark>
	the basis of	other forms of law in	that ensure the fight	<mark>legal norms that</mark>	norms that ensure the	norms that ensure the
	<mark>an intolerant</mark>	relation to	<mark>against extremism,</mark>	ensure the fight		<mark>fight against extremism,</mark>
	<mark>attitude to</mark>	professional activity,	terrorism and	<mark>against extremism,</mark>	<mark>extremism, terrorism</mark>	terrorism and corruption
	manifestation	legislation in the field	corruption in various	<mark>terrorism and</mark>	and corruption in	<mark>in various areas of life;</mark>
	s of	of countering	areas of life; ways to	corruption in various		ways to prevent these
	<mark>extremism</mark>	manifestations of	r	<mark>areas of life; ways to</mark>		phenomena.
	and	extremism, terrorism.	phenomena.	prevent these	▲	He is able to correctly
	<mark>terrorism, has</mark>	Be able to define and		phenomena.	He is able to correctly	analyze, interpret and
	<mark>the skills of</mark>	present their position		At the initial level,		apply the norms of law
	argumentatio	<mark>in the field of</mark>	1 11 2	<mark>he is able to</mark>		in the field of countering
	<mark>n of</mark>	psychology of	the norms of law in	correctly analyze,	law in the field of	<mark>extremism, terrorism</mark>
	countering	<mark>extremism and</mark>	<mark>the field of</mark>	interpret and apply		<mark>and corruption at an</mark>
	<mark>extremism</mark>	counterargument to	countering	the norms of law in		<mark>excellent level.</mark>
	and terrorism	the ideas of violence	<mark>extremism, terrorism</mark>	the field of		Has excellent
	in	<mark>in program and</mark>	and.	countering	level.	knowledge of countering
	professional	reporting documents	Has no knowledge of	extremism, terrorism	<u> </u>	<mark>extremism, terrorism</mark>
	activities	in a reasoned manner.	countering	and.	knowledge of	and corruption.
		He has the skills to	extremism, terrorism	Possesses at the	countering extremism,	
		create and systematize	and corruption	initial level	terrorism and	
		normative documents		knowledge of	corruption.	
		and programs for the		countering		
		prevention of		extremism, terrorism		
		extremism in oral and		and corruption.		
		written form, to draw				

up documents based on the results of monitoring the radicalization and deradicalization of young people.				
Criteria for assessing learning outcomes	unsatisfactory	satisfactory	good	excellent

## 6.1.2 Planned learning outcomes for testing general professional competencies and criteria for their evaluation

	ble to understand the re vithin their professional	egularities of economic syst activities	tem development an	nd based on them to o	offer sound organizat	ional and managerial
GPC.1.3.	Names and comments	Know the main sources	Does not know	Not confident in	Is not confident	Is confident in
	on the main sources	and methods of			enough in knowing	knowing the main
	and methods of	financing,	and methods of	-	the main sources	sources and methods
	financing, understands	To be able to distinguish	financing,	methods of	and methods of	of financing,
	the differences	the sources and methods	Does not know	financing,	financing,	Fully knows how to
	between them, and	of financing;	how to	Partially knows	In general, with	distinguish the
	can assess and choose	To know the methods of	distinguish the	how to distinguish	some gaps is able	sources and methods
	the necessary ones	assessment of the main	sources and	the sources and	to distinguish the	of financing;
	when solving	sources and methods of	methods of	methods of	sources and	At a high level owns
	professional tasks	financing and the choice	financing;	financing;	methods of	the methods of
		of the necessary ones	Does not know	Partially knows the	financing;	assessment and
		when solving the tasks	the methods of	methods of	Generally good	selection of the main
		formulated in the thesis.	assessment of the	evaluation of the	knowledge of	sources and methods
			main sources and	main sources and	methods of	of financing,
			methods of	methods of	assessment and	necessary to solve
			financing and the	financing and the	selection of the	the tasks formulated
			choice of the	choice of the	main sources and	in the thesis.
			necessary ones	necessary ones	methods of	
			when solving the	when solving the	financing,	
			tasks formulated	tasks formulated in	necessary for	
			in the thesis.	the thesis.	solving the tasks	
					formulated in the thesis.	

GPC.1.4.	Understands the content of the basic systems of accounting of the facts of economic life and the methodology of accounting statements to perform the tasks within their professional activities	To know the basic systems of accounting of business operations used in modern organizations; To know the skills of analysis and interpretation of accounting and reporting data in accordance with the goals and objectives of the the thesis; To master the skills of analysis and interpretation of accounting and reporting data in accordance with the goals and objectives of the the thesis.	Does not know the basic systems of business operations accounting used in modern organizations; Has not developed the ability to to use accounting and reporting data for analysis; Does not possess the skills to analyze and interpret accounting and reporting data in accordance with	Not confidently knows the basic systems of business operations accounting used in modern organizations; Partially formed ability to use accounting and reporting data for analysis; Satisfactory proficiency in analyzing and interpreting accounting and reporting data in accordance with the goals and	Insufficiently confidently knows the basic systems of business operations accounting used in modern organizations; In general, the ability to use accounting and reporting data for analysis is formed; Generally good skills in analyzing and interpreting accounting and reporting data	The student is confidently aware of the main systems of accounting of business operations, used in modern organizations; Strong ability to use accounting and reporting data for analysis; High level of proficiency in analyzing and interpreting accounting and reporting data in accordance with the goals and objectives of the graduate work
GPC.1.5.	Evaluates options for management and organizational decisions based on	To know the indicators of economic efficiency; To be able to evaluate the options of management	1 0		Not confident enough knows the indicators of economic	of the graduate work
	cost-effectiveness indicators, based on available information	and organizational decisions on their basis; To know the methods of extracting and evaluating	Does not know how to evaluate the options of management and	efficiency; Partially able to assess options of management and	efficiency; In general, is able to evaluate the options of	evaluate the options of management and organizational decisions on their

ional management and basis;
on their organizational Fully at a high level
decisions on their owns the methods of
knows the basis; extraction and
of Not fully owns the evaluation of options
g and methods of of management and
g options extraction and organizational
anagement evaluation of decisions according
anizational available to the theme of the
in information options thesis
ce with of management and
ne of the organizational
decisions in
accordance with
the theme of the
thesis
echnologies and use them to solve professional tasks,
emiorogies and use them to solve protessional tasks,
fident in Is insufficiently Is proficient in basic
the basic confident in basic ICT concepts;
of ICT; ICT concepts; Fully able to analyze
knows In general, with ICT, taking into
analyze some gaps, is able account current
king into to analyze ICT, trends in their
current taking into account development;
in their current trends in At a high level owns
ent; their development; the skills of using
knows In general, knows information and
to use how to use communication

		6 116	• .•	• ,•	• ,•	·
		performance and defense	communication	communication	communication	into account the
		of the thesis	technologies,	technologies,	technologies,	requirements of
			taking into	taking into account	taking into account	information security,
			account	information	the requirements of	including, during the
			information	security	information	performance and
			security	requirements,	security, including	defense of the thesis
			requirements,	including during	during the	
			including during	the performance	performance and	
			the performance	and defense of the	defense of the	
			and defense of the	thesis	thesis	
			thesis			
GPC.2.2	Focusing on the tasks	Is able to show basic	Is not able to	Does not	Not confident	Shows the necessary
	of professional	knowledge of ICT for	show basic	confidently show	enough shows the	basic knowledge of
	activity, reasonably	their reasonable choice in	knowledge of ICT	the necessary basic	necessary basic	ICT for their
	chooses information	order to solve the	for their	knowledge of ICT	knowledge of ICT	reasonable choice in
	and communication	problems formulated in	reasonable choice	for their reasonable	for their reasonable	order to solve the
	technologies and uses	the SQW with regard to	in order to solve	choice in order to	choice in order to	problems formulated
	them in professional	information security	the tasks	solve the tasks	solve the problems	in the SQW with
	activity, taking into	requirements;	formulated in the	formulated in the	formulated in the	regard to
	account the	Be able to show basic	SQW with regard	SQW with regard	SQW, taking into	information security
	requirements of	knowledge of ICT for	to information	to the requirements	account the	requirements;
	information security	their reasonable choice in	security	of information	requirements of	Fully able to show
		order to solve the	requirements;	security;	information	the basic knowledge
		problems formulated in	Is not able to	Partially able to	security;	of ICT for their
		the SQW with regard to	show basic	show the basic	Overall able to	reasonable choice in
		information security	knowledge of ICT	knowledge of ICT	show basic	order to solve the
		requirements;	for their	U	knowledge of ICTs	tasks formulated in
		Have basic knowledge of	reasonable choice	choice in order to	for their reasonable	the Bachelor's thesis
		ICT for their reasonable	in order to solve	solve the tasks	choice in order to	taking into account
		choice in order to solve	the tasks	formulated in the	solve the tasks	the requirements of
		the problems formulated	formulated in the	SQW, taking into		-

[	1			· · · · ·		
		in the SQW with regard	SQW with regard	account the	SQW with regard	Completely knows
		to information security	to information	requirements of	to information	the basic knowledge
		requirements;	security	information	security	of ICT for their
			requirements;	security;	requirements;	reasonable choice in
			Does not have	Partially knows the	In general has a	order to solve the
			basic knowledge	basic knowledge of	basic knowledge of	problems formulated
			of ICT for their	ICT for their	ICT for their	in the SQW, taking
			reasonable choice	reasonable choice	reasonable choice	into account the
			in order to solve	in order to solve	in order to solve	requirements of
			the tasks	the problems	the problems	information security;
			formulated in the	formulated in the	formulated in the	
			SQW, taking into	thesis, taking into	thesis, taking into	
			account the	account the	account the	
			requirements of	requirements of	requirements of	
			information	information	information	
			security;	security;	security;	
GPC.3. Is a	able to independently ca	rry out research activities	in their professiona	l field using modern	research methods	
		-	_	_		
GPC.3.1.	sets the goal and	To know the basic	Does not know	Does not	In general, with	He/she knows the
	objectives and makes	principles of goal-	the basic	confidently	some gaps,	principles of goal-
	a plan for scientific	setting, principles of	principles of	know the basic	knows the basic	setting, principles
	research within their	problem-setting	goal-setting,	principles of	principles of	of problem-setting
	professional field	depending on the goal	the principles	goal-setting,	goal-setting,	depending on the
		within the chosen topic	of setting	principles of	principles of	goal within the
		of the the thesis;	objectives	setting tasks	setting tasks	selected topic of
		To be able to define	depending on	depending on the	depending on the	the thesis;
		tasks based on the goal	the goal within	goal within the	goal within the	The ability to
		set in the thesis and its	the selected	selected topic of	selected topic of	define tasks based
		relevance;	topic of the	the thesis;	the the thesis;	on the goal set in
1		To be able to justify	thesis;	Partially knows		-

		the selected ways of problem solving, based on the set goal and make a plan of scientific research when writing the thesis.	No skills and no abilities.	the basic principles of goal-setting and principles of problem-setting depending on the goal and relevance of the thesis; Partially knows the skills of justification of the selected ways of problem solving, based on the set goal and makes a plan of scientific research when writing the thesis.	able to define tasks, based on the goal set in the thesis and its relevance; In general, with a few gaps, he/she has the skills to justify the selected ways of problem solving, based on the set goal and make a plan of scientific research in writing the thesis.	relevance is formed; High level of skills to justify the selected ways of problem solving, based on the set goal and make a plan for scientific research in writing the thesis.
GPC.3.2.	collects, critically analyzes and processes information, applying scientific and applied research methods in accordance with the task;	To know the rules of selection and processing of necessary information, applying a variety of methods of scientific and applied research, critical analysis for the preparation and defense of the thesis; To be able to analyze and	Does not know the rules of selection and processing of necessary information, does not apply a variety of methods of scientific and	Partially knows the rules of selection and processing of necessary information, partially applies some methods of scientific and applied research to prepare for the	In general knows the rules of selection and processing of necessary information, in general with some gaps applies a variety of methods of scientific and	At a high level without gaps knows the rules of selection and processing of necessary information, applying a variety of methods of scientific and applied research, critical analysis for

select the necessary information sources for	applied research for the	defense of the thesis; partially	applied research for the preparation and	the preparation and defense of the thesis
the preparation and	preparation and	knows how to	defense of the	
defense of the thesis;	defense of the	analyze and select	thesis, conducts a	answer to additional
To know the rules of	thesis;	necessary	critical analysis; in	questions of the
selection and processing	does not know	information	general is able to	ticket; at a high level
of necessary informatio	h, how to analyze	sources, critically	analyze and select	can analyze and
using a variety of	and select the	analyze them in the	the necessary	select the necessary
methods of scientific an	d necessary	preparation and	information	information sources
applied research, critica	l information	defense of the	sources in the	in the preparation
analysis for the	sources in the	thesis;	preparation and	and defense of
preparation and defense	preparation and	partially knows the	defense of the	thesis;
of the thesis.	defense of the	rules of selection	thesis;	at a high level owns
	thesis;	and processing of	in general at a good	the rules of selection
	Does not know	necessary	level knows the	and processing of
	the rules of	information,	rules of selection	necessary
	selection and	partially applies	and processing of	information,
	processing of	some methods of	necessary	applying a variety of
	necessary	scientific and	information,	methods of scientific
	information, does	applied research for	partially applying a	and applied research
	not apply a	the preparation and	variety of methods	1 1
	variety of	defense of the	of scientific and	and defense of the
	methods of	thesis.	applied research for	thesis and in
	scientific and		the preparation and	preparing an answer
	applied research		defense of the	to additional
	for the		thesis.	questions on the
	preparation and			subject of the thesis.
	defense of the			
	thesis.			

GPC.3.3.	finds deficiencies and	To know quantitative and	Does not know	Partially knows	In general, knows	Fully knows
	gaps in the economic	qualitative methods of	quantitative and	quantitative and	quantitative and	quantitative and
	system under study	analysis of economic	qualitative	qualitative methods	qualitative methods	qualitative methods
	within his/her	systems to prepare and	methods of	of analysis of	of analysis of	of analysis of
	professional field and	defend the thesis;	analysis of	economic systems	economic systems	economic systems
	substantiates	To be able to find	economic systems	for the preparation	for the preparation	for the preparation
	proposals to	shortcomings and gaps in	for the	and defense of the	and defense of the	and defense of the
	eliminate the	the subject area of	preparation and	thesis;	thesis;	thesis;
	identified	economic system;	defense of the	Partially knows	In general, with	Is able to find
	deficiencies and gaps	To be able to argue and		how to find	some remarks is	deficiencies and
		justify the proposals for		deficiencies and	able to find	gaps in the subject
		the elimination of the	how to find	gaps in the subject	shortcomings and	area of the economic
		identified deficiencies in	deficiencies and	area of economic	gaps in the studied	system;
		the preparation and	gaps in the	system;	subject area of	At a high level owns
		defense of the thesis.	subject area of	Fragmentary	economic system;	the skill to argue and
			economic system;	knows the skill to	U I	justify the proposals
			Does not know	argue and justify	-	to eliminate the
			how to argue and	the proposals to	the skill to argue	identified
			justify the	eliminate the	and justify the	deficiencies in the
			proposals for the		proposals to	work on the
			elimination of the	deficiencies in the	eliminate the	preparation and
			identified	work on the	identified	defense of the thesis.
			deficiencies in the	preparation and	deficiencies in the	
			preparation and	defense of the	preparation and	
			defense of the	thesis.	defense of the	
			thesis.		thesis.	

GPC.3.4.	prepares and presents	To know the	Does not know	Partially knows the	Insufficiently	Confidently knows
	the results of their	methodological	the	methodological	confident in	the methodological
	scientific and applied	recommendations and	methodological	recommendations	knowing the	recommendations
	research in writing	specifics of presenting	recommendations	and specifics of	methodological	and specifics of the
	and orally, using	answers in written and	and specifics of	presenting answers	recommendations	presentation of
	information	oral form to the questions	presenting	in written and oral	and the specifics of	answers to the
	technology	of the SCC.	answers in written	form to the	the answers to the	questions in the
		To be able to present the	and oral form to	questions of the	questions in the	defense of the thesis;
		results of the conducted	the questions of	SCC;	defense of the	The confident ability
		preparation for the	the SCC;	Partially knows	thesis;	to present the results
		defense of the thesis with	Does not know	how to present the	In general, the	of the preparation for
		the use of, including	how to present the	results of the	ability to provide	the defense of the
		Internet sources	results of the	training carried out	answers to the	thesis with the use
		(information technology)	preparation for	before the defense	questions in written	of, including IT is
		in written and oral form.	the exam,	of the thesis,	and oral form is	formed
		Know how to design,	including the use	including the use of	formed.	The results of the
		discuss and present the	of Internet	Internet sources	The results of the	preparation for the
		results of answers to the	sources	(information	preparation for the	defense of the thesis
		questions of the State	(information	technology) in	SCC in general	are designed in
		Commission for	technology) in	written and oral	with minor	accordance with the
		Academic Degrees and	written and oral	form.	comments meet the	requirements.
		Titles	form before the	Fragmentary	requirements for	
			defense of the	knows how to	the preparation and	
			GQW.	design, discuss and	defense of the	
			No skills	present the results	thesis.	
				of the answers to		
				the questions on		
				the topic of the		
				Master's thesis		
		and economic-mathematica	al methods for proce	essing economic infor	mation and identifyi	ng patterns in
economic p	rocesses					

GPC.4.2	Applies methods of	To know the basic	Does not know	Partial knowledge	In general, with	Is able to describe
	summarizing and	methods of statistical	the basic methods	of basic methods of	minor mistakes	the economic
	grouping quantitative	analysis and to use in the	of statistical	statistical analysis	knows the basic	situation by
	information and	processing of data in the	analysis and their	and their use in the	methods of	quantitative methods
	describing the	practical part of the	use in the	processing of data	statistical analysis	with a system of
	economic situation	thesis;	processing of data	in the practical part	and their use in the	interrelated
	using statistical	To be able to describe the	in the practical	of the GQW;	processing of data	statistical indicators;
	indicators	economic situation using	part of the GQW;	Fragmentary	in the practical part	On a high level of
		quantitative methods by a	Does not know	knows how to	of the GQW;	general proficiency
		system of interrelated	how to describe	describe the	Generally able to	in the application of
		statistical indicators;	the economic	economic situation	describe the	statistical methods to
		To be able to use	situation with	by quantitative	economic situation	describe the
		statistical methods to	quantitative	methods using the	by quantitative	economic situation
		describe the economic	methods by the	system of	methods with a	in the thesis with the
		situation in the thesis	system of	interrelated	system of	use of interrelated
		with the use of	interrelated	statistical	interrelated	system of statistical
		interconnected system of	statistical	indicators;	statistical	indicators
		statistical indicators	indicators;	Partially knows the	indicators;	
			Does not know	skill of applying	On a good level,	
			how to use	statistical methods	generally knows	
			statistical	to describe the	how to apply	
			methods to	economic situation	statistical methods	
			describe the	in the thesis with	to describe the	
			economic	the use of	economic situation	
			situation in the	•	in the paper using	
			thesis with the use		the interconnected	
			of interrelated	indicators	system of statistical	
			system of		indicators	
			statistical			
			indicators			

		the problems solved.		solved.	
GPC.7. Is able to model, analyze trategic goals using modern metho		ocesses and information	ation technology infr	astructure of an ent	erprise to achieve its
GPC.7.2. Models enterprise business processes using modern methods and software tools to determine the level of achievement of strategic objectives	To know modern methods and software tools for modeling business processes included in the GQW; To be able to apply the knowledge of modern methods and software tools for modeling business processes to determine the level of achievement of strategic objectives; To know how to apply modern methods and software tools to determine the level of achievement of strategic objectives in the process of modeling of business processes analyzed in the thesis.	Does not know modern methods and software tools for modeling of business processes included in the GQW; Does not know how to apply the knowledge of modern methods and software tools for modeling business processes to determine the level of achievement of strategic objectives; Does not know how to apply modern methods and software tools	business processes included in the Bachelor's and Master's thesis; Partially able to apply the knowledge of modern methods and software tools for modeling business processes to determine the level of achievement of strategic objectives; Fragmentary knows how to apply modern methods and	In general, with some inaccuracies knows modern methods and software tools for modeling of business processes included in the GQW; In general, is able to apply the knowledge of modern methods and software tools for modeling business processes to determine the level of achievement of strategic objectives; On a good level in general knows how to apply modern	In general he/she is confidently knows modern methods and software tools for modeling business processes included in the GQW; Fully able to apply the knowledge of modern methods and software tools for modeling business processes to determine the level of achievement of strategic objectives; At a high level in general knows how to apply modern methods and software tools to determine the level of achievement of strategic objectives; in the modeling of

			to determine the level of achievement of strategic objectives in the modeling of business processes analyzed in the thesis.	in the modeling of business processes	software tools to determine the level of achievement of strategic objectives in the modeling of business processes analyzed in the thesis.	business processes analyzed in the thesis.
GPC.7.3.	Analyzes the information and technological infrastructure of the enterprise in order to improve it to achieve the strategic goals of the owners	To know the metamodels, artifacts describing the information and technological infrastructure (IT infrastructure) of the enterprise in order to achieve the strategic goals of the owner and support the business processes corresponding to these goals; to be able to show knowledge of methods, standards of analysis of the IT infrastructure components of the enterprise in order to achieve the strategic goals of the owner and support the business processes corresponding to these goals; to be able to show knowledge of methods, standards of analysis of the IT infrastructure components of the enterprise in order to achieve the strategic goals of the owner and	processes; Does not know how to show in the response to the relevant question	Partially able to show knowledge of methods, standards of analysis of the IT infrastructure components of the	In general, with some gaps, knows the metamodels, artifacts describing the information technology infrastructure (IT infrastructure) of the enterprise in order to achieve the owner's strategic goals and support the business processes corresponding to these goals; In general, at a fairly good level is able to show in response to the relevant question the	Fully confidently knows the metamodels, artifacts describing the information and technological infrastructure (IT infrastructure) of the enterprise to achieve the strategic goals of the owner and support related to these goals business processes; In general, at a high level is able to show in response to the appropriate question the knowledge of methods, standards of analysis of the IT

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	support business	methods,	achieve the	knowledge of	infrastructure
	processes corresponding		strategic goals of	methods, standards	components of the
	to these goals; to have	analysis of the IT	the owner and	for analyzing the	enterprise to achieve
	the ability, in accordance	infrastructure	support related to	components of the	the strategic goals of
	with the objectives of the	components of	these goals	IT infrastructure of	the owner and
	the thesis, to identify	the enterprise to	business processes	the enterprise to	support related to
	methods, standards of	achieve the	in response to the	achieve the owner's	these goals business
	analysis of the IT	strategic goals of	relevant question;	strategic goals and	processes; In
	infrastructure	the owner and	Fragmentarily	support the	general, has the
	components of the	support related to	owns the ability, in	corresponding	ability, in
	enterprise	these goals of	accordance with	business processes;	accordance with the
		business	the objectives of	In general, knows	owner's strategic
		processes; Does	the Bachelor's	the methods and	objectives and
		not have the	thesis to identify	standards for	business processes
		ability, in	methods, standards	analyzing the IT	
		accordance with	of analysis of the	infrastructure of the	
		the objectives of	IT infrastructure	enterprise to	
		the GQW, to	components of the	achieve the owner's	
		identify methods,	enterprise to	strategic goals and	
		standards of	achieve the	support the	
		analysis of the IT	strategic objectives	business processes	
		infrastructure	of the owner and	corresponding to	
		components of		these goals	
		the enterprise to	corresponding		
		achieve the	goals of business		
		strategic goals of	processes.		
		the owner and			
		support related to			
		these goals of			
		business			
		processes			

		esses of creating and using thms and programs for the	-		ormation and commu	nication technologies,
GPC.8.1	manages the business processes of creating	Knows standard information technology,	Does not know the standard	Partially knows the standard	In general, with minor inaccuracies	In general confidently knows
	and using	the basic economic	information	information	knows the standard	the standard
	information and	concepts of information	technology, basic	technology, the	information	information
	communication	systems for the rational	economic	basic economic	technology, basic	technology, the basic
	technology products	management of business	concepts of	concepts of	economic concepts	economic concepts
	and services;	processes of creation and	information	information	of information	-
		use of products and	systems for the	systems for the	systems for the	systems for the
		services of information	rational	rational	rational	rational management
		and communication	management of	management of	management of	of business
		technologies included in	business	business processes	business processes	processes of creation
		the GQW; knows how to	processes to	of creation and use	of creation and use	and use of products
		apply knowledge of	create and use	of products and	of products and	and services of
		standard information	products and	services of	services of	information and
		technology, the basic	services of	information and	information and	communication
		economic concepts of	information and	communication	communication	technologies
		information systems to	communication	technologies	technologies	included in the
		manage business	technologies	included in the	included in the	GQW; In general at
		processes based on	included in the	GQW; Partially	GQW; In general,	Ū.
		rational solutions	GQW; Does not	knows how to	at a good level is	apply knowledge of
		included in the GQW;	know how to	apply the	able to apply	standard information
		has the ability to apply	apply knowledge	knowledge of	knowledge of	technology, basic
		knowledge of standard		standard	standard	economic concepts
		information technologies,	information	information	information	of information
		the basic economic	technology, basic	technology, the	technology, basic	systems to manage
		concepts of information	economic	basic economic	economic concepts	business processes
		systems to manage	concepts of	concepts of	of information	based on rational
		business processes of	information	information	systems for	solutions included in
		creating and using	systems to	systems to manage	business process	the EKR; In general,

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	products and services of	manage business	business processes	0	fully owns the ability
	information and	processes based	based on rational	basis of rational	to apply knowledge
	communication	on rational	solutions included	solutions included	
	technologies on the basis	solutions included	in the GQW;	in the BWC; In	information
	of rational solutions	in the GQW;	Fragmentarily	general has the	technology, the basic
	included in the GQW.	Does not possess	owns the ability to	ability to apply	economic concepts
		the ability to	apply knowledge of	knowledge of	of information
		apply knowledge	standard	standard	systems to manage
		of standard	information	information	business processes
		information	technologies, the	technology, the	of creation and use
		technology, the	basic economic	basic economic	of products and
		basic economic	concepts of	concepts of	services of
		concepts of	information	information	information and
		information	systems to manage	systems to manage	communication
		systems to	business processes	business processes	-
		manage business	of creation and use	of creation and use	on rational solutions
		processes of	of products and	of products and	included in the
		creation and use	services of	services of	GQW.
		of products and	information and	information and	
		services of	communication	communication	
		information and	technologies on the	technologies on the	
		communication	basis of rational	basis of rational	
		technologies on	solutions included	solutions included	
		the basis of	in the GQW.	in the GQW.	
		rational solutions			
		included in the			
		GQW.			
	To know the theoretical		Partially knows the	In general, with	2
and programs for	foundations of the	theoretical	theoretical	some inaccuracies	theoretical
their practical	development of	foundations of the	foundations of the	knows the	foundations of the
implementation	algorithms and programs	development of	development of	theoretical	development of

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		for their practical	U	algorithms and	foundations of the	algorithms and
		application in the SRC;	programs for their	programs for their	development of	programs for their
		To be able to apply the	_	practical	algorithms and	practical application
		knowledge of the theory	application in the	application in the	programs for their	in the GQW;
		of algorithms and	GQW;	GQW;	practical	In general at a high
		programs for the	To be able to	Partially able to	application in the	level is able to apply
		development and	apply the	apply the	thesis;	the knowledge of the
		implementation of the	knowledge of the	knowledge of the	In general, is able	theory of algorithms
		applied part of the thesis;	theory of	theory of	to apply the	and programs for the
		To master the theoretical	algorithms and	algorithms and	knowledge of the	development and
		foundations of the	programs for the	programs for the	theory of	implementation of
		development and	development and	development and	algorithms and	the applied part of
		implementation of	implementation of	implementation of	programs for the	the thesis;
		algorithms and programs	the applied part of	the applied part of	development and	is confident in the
		of the practical part of	the thesis;	the thesis;	implementation of	theoretical
		the thesis	To master the	Fragmentarily	the applied part of	foundations of the
			theoretical	knows the	the thesis;	development and
			foundations of the	theoretical	In general, knows	implementation of
			development and	foundations of the	the theoretical	algorithms and
			implementation of	development and	foundations of the	programs of the
			algorithms and	implementation of	development and	practical part of the
			programs of the	algorithms and	implementation of	thesis.
			practical part of	programs of the	algorithms and	
			the thesis.	practical part of the	programs of the	
				thesis.	practical part of the	
					thesis.	
GPC.8. Is	able to use information	, methods and software of	f its collection, proc	essing and analysis f	for information and	analytical support of
managemen	nt decisions					
GPC.9.2	Uses methods and	To know the rules of		Partially knows the	In general knows	In general knows
	software for	selection and processing	the rules of	rules of selection	and uses the rules	and uses the rules of
	collecting, processing	of necessary information,	selection and	and processing of	of selection and	selection and
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and analyzing	using appropriate	processing of	necessary	processing of	processing of
information to	methods and software	necessary	information,	necessary	necessary
provide information	tools; To be able to	information,	applying	information,	information,
and analytical	support the adoption of	applying	appropriate	applying	applying appropriate
support for	management decisions,	appropriate	methods and	appropriate	methods and
management	using methods and	methods and	software tools;	methods and	software tools;
decision-making	software tools of	software tools;	Partially knows	software tools; In	Skilled in supporting
	collection, processing	Does not know	how to support the	general, with minor	the adoption of
	and analysis of	how to support	adoption of	inaccuracies is able	management
	information;	the adoption of	management	to support the	decisions, using
	To know the rules of	management	decisions, using	adoption of	methods and
	selection and processing	decisions, using	methods and	management	software tools of
	of necessary information,	methods and	software tools of	decisions, using	collection,
	using a variety of	software tools of	collection,	methods and	processing and
	methods of scientific and	collection,	processing and	software tools of	analysis of
	applied research and	processing and	analysis of	collection,	information;
	software tools, for the	analysis of	information;	processing and	In general at a high
	preparation and defense	information;	Partially knows the	analysis of	level knows the rules
	of the thesis.	Does not know	rules of selection	information;	of selection and
		the rules of	and processing of	In general at a good	processing of
		selection and	necessary	level knows the	necessary
		processing of	information,	rules of selection	information,
		necessary	applying a variety	and processing of	applying a variety of
		information,	of methods of	necessary	methods of scientific
		applying a variety	scientific and	information,	and applied research
		of methods of	applied research	applying a variety	and software tools,
		scientific and	and software tools,	of methods of	for the preparation
		applied research		scientific and	and defense of the
		and software	defend the thesis.	applied research	thesis.
		tools, to prepare		and software tools,	
		and defend the		for the preparation	
		thesis.		and defense of the	

					thesis.	
GPC.10. Is	able to organize interac	tion with clients and partr	lers in the process o	f solving problems of	information systems	and information and
communica	tion technologies life cy	cle management	-			
GPC.10.1	Organizes interaction with clients and partners in the process of solving problems of life cycle management of information systems and information and communication technologies	-	Does not know the rules, technologies of interaction with customers and partners in the process of solving the problems of lifecycle management of information systems and information and communication technologies to reflect them when necessary to consider this issue	Partially knows the rules, technologies of interaction with customers and partners in the process of solving the problems of lifecycle management of information systems and information and communication technologies to reflect them when necessary to consider this issue in the framework	In general, with some inaccuracies knows the rules, technologies of interaction with customers and partners in the process of solving the problems of lifecycle management of information systems and information and communication technologies to reflect them when	Is confidently aware of the rules, technologies of interaction with customers and partners in the process of solving the problems of lifecycle management of information systems and information and communication technologies to reflect them when necessary to consider this issue in the framework of the
		the process of solving problems of information		of the GQW; Partly able to apply the	necessary to consider this issue within the	
		systems life cycle	how to apply the	rules, technologies	framework of the	rules, technologies
		management and information and	rules, technologies of	of interaction with customers and	GQW; In general, is able to apply the	of interaction with customers and
		communication technologies to reflect	interaction with	partners in the process of solving	rules, technologies	partners in the process of solving

tha	em when necessary to	partners in the	the problems of	customers and	the problems of
	nsider this issue in the	process of solving	lifecycle		lifecycle
		1 0	J	1	2
	amework of the GQW;	the problems of	management of	process of solving	management of
	now the skills and	lifecycle	information	the problems of	information systems
	ilities to apply the	management of	systems and	lifecycle	and information and
	les, technologies of	information	information and	management of	communication
	teraction with	systems and	communication	information	technologies to
	stomers and partners to	information and	technologies to	systems and	reflect them when
	flect them when	communication	reflect them when	information and	necessary to
	cessary to consider this	technologies to	necessary to	communication	consider this issue in
iss	sue in the GQW.	reflect them when	consider this issue	technologies to	the framework of the
		necessary to	within the	reflect them when	GQW; In general, at
		consider this issue	framework of the	necessary to	a high level has the
		in the GQW;	GQW;	consider this issue	skill to apply the
		Does not have the	Fragmentary has	within the	rules, technologies
		skill to apply the	the skill to apply	framework of the	of interaction with
		rules,	the rules,	GQW; In general	customers and
		technologies of	technologies of	has the skill to	partners in the
		interaction with	interaction with	apply the rules,	process of solving
		customers and	customers and	technologies of	problems of
		partners in the	partners in the	interaction with	information systems
		process of solving	process of solving	customers and	lifecycle
		the problems of	the problems of	partners in the	management and
		lifecycle	information	process of solving	information and
		management of	systems life cycle	problems of	communication
		information	management and	information	technologies for
		systems and	information and	systems lifecycle	their reflection when
		information and	communication	management and	necessary to
		communication	technologies to	information and	consider this issue
		technologies for	reflect them when	communication	within the
		their reflection	necessary to	technologies for	framework of the
		when necessary to	consider this issue	their reflection	GQW

			consider this issue within the framework of the GQW	in the framework of the GQW	when necessary to consider this issue within the framework of the GQW	
GPC.10.2.	Participates in the process of solving life cycle management problems of information systems and information and communication technologies	To know the methods, technologies of solving problems of management of the life cycle of information systems and information and communication technologies in the course of writing and defense of the thesis; To be able to apply methods, technologies of solving problems of management of the life cycle of information systems and information and communication technologies in the course of writing and defense of thesis; To master the skill of describing participation in the process of solving problems of management of the life cycle of	Does not know the methods, technologies of solving problems of management of the life cycle of information systems and information and communication technologies in the process of writing and defense of the thesis; Does not know how to apply methods, technologies of solving problems of management of the life cycle of information systems and information and communication	information systems and information and communication technologies during the writing and defense of the thesis; Partially knows how to apply methods, technologies of solving problems of management of	In general, with some inaccuracies knows the methods, technologies of solving problems of management of the life cycle of information systems and information and communication technologies in the process of writing and defending the the thesis; In general, with some gaps knows how to apply methods, technologies to solve problems of management of the life cycle of information systems and	In general, confidently knows the methods, technologies of solving problems of management of the life cycle of information systems and information and communication technologies in the course of writing and defense of the thesis; In general at a high level is able to apply methods, technologies to solve problems of management of the life cycle of information systems and information and communication technologies in
		information systems and	technologies in	the writing and	information and	of thesis; Strong

information and communication technologies.	the process of writing and defense of thesis; Does not have the skill to describe participation in the process of solving problems of management of the life cycle of information systems and information and communication technologies.	Fragmentary knows the skill of describing participation in the process of solving problems of management of the life cycle of	has the skill to describe participation in the process of solving problems of management of the life cycle of information systems and information and communication	
Criteria for assessing learning outcomes	unsatisfactory	satisfactory	technologies good	excellent

## 6.1.3 Planned learning outcomes for testing professional competencies and their assessment criteria

		2 Able to analyze, justify and select solutions based on business analysis of information using information technology						
records, analyzes, documents the results of business analysis in accordance with the selected information technology to the of system analysis of system analysis nalysis to identifying, recording, accordance with the selected information technology to the technology to the of system analysis nof sys	how to apply modern information technologies to obtain the results of business analysis in accordance with the chosen approach implemented in the thesis; Partially knows the	some inaccuracies knows the basic economic- mathematical and statistical methods and models for the identification, registration, registration of the results of business analysis in accordance with the theme of the the thesis; In general, is able to apply modern information technologies to obtain the results of business analysis in accordance with the	level knows the basic economic- mathematical and statistical methods and models to identify, register, formalize the results of business analysis in accordance with the theme of the the thesis; In general, is able to apply modern information technologies to obtain the results of business analysis in accordance with the chosen approach implemented in the thesis; Fully masters the methodology of system analysis to identify, record, and					

				system analysis to identify, record, and analyze the results of business analysis.	methodology of system analysis to identify, record, and analyze the results of business analysis.	business analysis.
PC.2.2.	Determines the relationships and dependencies between elements of business analysis information in accordance with the selected approaches using information technology to the extent necessary for the purposes of system analysis	To know the methodology of systems analysis for the study of problems in the GQW; To be able to identify the structure (connections and dependencies) of the problem for its business analysis in accordance with the selected approaches in the GQW; To master the skills of using modern ICT for business analysis of information in accordance with the selected approaches in the GQW.	Does not know the methodology of systems analysis for the study of problems in the GQW; Does not know how to identify the structure (connections and dependencies) of the problem for its business analysis in accordance with the selected approaches in the GQW; Does not know the skills of applying modern ICT for business analysis of information in accordance with the selected approaches in the	Partially knows the methodology of systems analysis for the study of problems in the GQW; Partly able to identify the structure (connections and dependencies) of the problem for its business analysis in accordance with the selected approaches in the thesis; Fragmentary knows the skills of using modern ICT for business analysis of information in	In general, with some gaps knows the methodology of systems analysis for the study of problems in the GQW; In general at a good level is able to identify the structure (connections and dependencies) of the problem for its business analysis in accordance with the selected approaches in the thesis; In general, with some inaccuracies knows the skills of using modern ICT for business analysis of	Fully knows the methodology of systems analysis for the study of problems in the GQW; Fully at a high level is able to identify the structure (connections and dependencies) of the problem for its business analysis in accordance with the selected approaches in the GQW; Fully proficient in the application of modern ICT for business analysis of information in accordance with the selected

			thesis.	accordance with the selected approaches in the thesis.	information in accordance with the selected approaches in the thesis.	approaches in the thesis.
PC.2.3.	Solves the problems of	To know the methods, models of business	Does not know the methods, models of	Partially knows the methods, models of	In general, with minor gaps knows	Fully knows the methods, models of
	business analysis,	analysis of enterprise	business analysis of	business analysis of	the methods, models	business analysis of
	taking into	information in order to	enterprise	enterprise	of business analysis	enterprise
	account	achieve the strategic	information in order	information in	of of enterprise	information in order
	strategies,	objectives of the owner	to achieve the	order to achieve the	information in order	to achieve the
	objectives,	and to support the	strategic objectives	strategic objectives	to achieve the	strategic objectives
	business	business processes and	of the owner and	of the owner and	strategic goals of the	of the owner and to
	processes and	information and	support the business	support the	owner and support	support the business
	information	technological structure of	processes and	business processes	the corresponding	processes and
	technology	the organization	information and	and information	goals of business	information
	structure of the	corresponding to these	technological	technology	processes and	technology structure
	organization	objectives;	structure of the	structure of the	information and	of the organization
	using information	To be able to solve the	organization	organization	technological	corresponding to
	technology to the	problems set in the	corresponding to	corresponding to	structure of the	these objectives;
	extent necessary	GQW, using the	these objectives;	these objectives;	organization;	Is able to solve the
	for the purpose of	methods, models adopted	Does not know how	Partially able to	In general,	problems set in the
	analysis and	in the business analysis	to solve the	solve the problems	practically without	GQW, using the
	choice of	of the enterprise, and	problems set in the	set in the GQW,	critical remarks, is	methods, models
	solutions,	choose the best solutions,	GQW, with the help	using the methods,	able to solve	adopted in the
	including	including, for planning	of methods, models	models adopted in	problems set in the	business analysis of
	planning and	and managing the	adopted in the	the business	GQW, with the help	the enterprise, and
	management of	development of	business analysis of	analysis of the	of methods, models	choose the best
	information	information systems; To	the enterprise, and	enterprise, and	adopted in business	solutions, including,
	systems	have the skills in accordance with the	choose the best	choose the best	analysis of	for planning and managing the
	development	accordance with the	solutions, including,	solutions,	enterprise, and	managing the

	objectives of the GQW to	for planning and	including, for	choose the best	development of
	identify methods, models	managing the	planning and	solutions, including,	information systems;
	of business analysis of	development of	managing the	for planning and	Fully has the skills
	the enterprise in order to	information systems;	development of	managing the	in accordance with
	achieve the strategic	Does not have the	information	development of	the objectives of the
	objectives of the owner	skills in accordance	systems;	information systems;	GQW to identify
	and support the business	with the objectives	Fragmentary has	In general, the skills	methods, models of
	processes and	of the GQW to	the skills in	in accordance with	business analysis of
	information technology	identify methods,	accordance with	the objectives of the	the enterprise in
	structure of the	models of business	the objectives of	Bachelor's degree	order to achieve the
	organization	analysis of the	the GQW to	program determine	strategic objectives
	corresponding to these	enterprise to achieve	determine the	the methods, models	of the owner and
	objectives with the use of	the strategic	methods, models of	of business analysis	support the goals of
	modern information	objectives of the	•	of the enterprise in	the business
	technology.	owner and support		order to achieve the	processes and
		corresponding to	achieve the	strategic goals of the	information
		these objectives,	strategic goals of	owner and support	technology structure
		business processes	the owner and	corresponding to	of the organization
		and information	support the	these goals business	with the use of
		technology structure	corresponding	processes and	modern information
		of the organization	goals of business	information and	technology
		using modern	processes and	technological	
		information	information	structure of the	
		technology.	technology	organization using	
				modern information	
			organization with	technology.	
			the use of modern		
			information		
			technology		

PC.3. Able to plan and organ	ize analytical work, includi	ng the use of big data t	echnologies.		
PC.3.1 Develops, discusses, an approves th content co analytical work including the us of big dat technologies.	e recommendations and f specifics of the presentation of research results in the form of	methodological recommendations and specifics of presentation of research results in the form of chapters of the thesis using information technologies, including big data technologies; Does not know how to develop, approve the content of analytical works, corresponding to the content of the thesis together with the	presentation of research results in the form of chapters of the thesis using information	In general, with small gaps knows the methodological recommendations and specifics of the presentation of research results in the form of chapters of the thesis using information technologies, including big data technologies; In general, with small gaps is able to develop, approve the content of analytical works, corresponding to the content of the thesis together with the supervisor; In general, is able to use big data technologies in accordance with the theme of the thesis	methodological recommendations and specifics of the presentation of research results in the form of chapters of the thesis using information technologies, including big data technologies; Is confidently able to develop, approve the content of analytical works, corresponding to the content of the thesis together with the supervisor; Fully masters the skill of using big data technologies in accordance with the

PC.3.2	Determines team	To know the methods	Does not know the	Partially knows the	In general knows the	He/she is proficient
10.5.2	composition for	and models of data		methods and	methods and models	-
	data analysis,	analysis to solve the		models of data		models of data
	including big	problems included in the	~	analysis to solve	•	analysis for solving
	data.	GQW, which are part of	1	the problems	included in the	the problems
	uata.	the tasks of group project		included in the	GQW, which are	included in the
		work. To be able to apply	_	GQW, which are	-	
			1	-	part of the tasks of	_
		modern methodologies,	1 5	part of the tasks of	1 5	part of the tasks of
		methods to determine the		group project work.	In general is able to	team project work.
		composition of the group		Partially knows	apply modern	Fully able to apply
		within the team work. To	0 ,	how to apply	methodologies,	modern
		know the skills of		modern	methods to	methodologies,
		determining the tasks of		methodologies,	determine the	methods to
		teamwork, including	1	methods to	composition of the	determine the
		determining the	group within the	determine the	team within the team	composition of the
		composition of the group		composition of the	_	team within the
		for the analysis of data		team within the	with some remarks,	teamwork. Generally
		(big data).	determine the tasks	teamwork. Partially	is able to determine	knows how to
			included in the	knows how to	the tasks of	determine the tasks
			teamwork, including	determine the tasks	teamwork, including	of teamwork,
			determining the	included in the	the determination of	including team
			composition of the	teamwork,	the team	composition for data
			group for the	including	composition for data	analysis (big data)
			analysis of data (big	determining the	analysis (big data).	without any remarks.
			data).	team composition		
				for data analysis		
				(big data).		

PC.3.5.	Allocates	roles	To know the solution	Does not know the	Partially knows	In general, knows	He knows firmly
	and comp	osition	of the main tasks of	solution of the	how to solve the	the solution of the	the solution of the
	of analytical work		data analysis (big data)	main tasks of data	main tasks of	main tasks of data	main tasks of data
	among	team	in the preparation and	analysis (big data)	data analysis (big	analysis (big data)	analysis (big data)
	members	to	defense of the thesis in	in the preparation	data) in the	in the preparation	in the preparation
	analyze	data	accordance with the	and defense of the	preparation and	and defense of the	and defense of the
	(including	big	specific ongoing	thesis in	defense of the	thesis in	thesis in
	data).	_	activity (role) within	accordance with	thesis in	accordance with	accordance with
			the teamwork.	the specific	accordance with	the specific	the specific
			To be able to distribute	activities (role)	the specific	activities (role)	activities (roles)
			the roles and	performed within	activities (role)	within the	performed within
			composition of	the teamwork.	within the	teamwork.	the teamwork.
			analytical work in	Is not able to	teamwork.	In general, with	Generally knows
			accordance with the	allocate roles and	Partially able to	some comments,	how to allocate
			tasks solved by each	composition of	allocate roles and	is able to	roles and
			member of the group,	analytical work in	composition of	distribute the roles	composition of
			formulated in the EWC	accordance with	analytical work	and composition	analytical work in
			and the specific	the tasks solved by	in accordance	of analytical work	accordance with
			activities carried out	each member of	with the tasks	in accordance with	the objectives of
			within the framework	the group,	solved by each	the tasks solved by	each member of
			of teamwork.	formulated in the	member of the	each member of	the team
			To be able to solve the	GQW and the	group,	the group,	formulated in the
			problems of data	specific activities	formulated in the	formulated in the	GQW and the
			analysis (big data) in	carried out as part	GQW and the	GQW and the	specific activities
			the preparation and	of teamwork.	specific activities	specific activities	performed within
			defense of the thesis in	Does not know	carried out	carried out within	the team work.
			accordance with the	how to solve the	within the team	the team work.	Is fully able to
			specific activities	problems of data	work.	Generally able to	solve the problems
			carried out within the	analysis (big data)	Not fully able to	solve the problems	of data analysis
			framework of	in the preparation	solve the	of data analysis	(big data) in the
			teamwork	and defense of the	problems of data	(big data) in the	preparation and
				thesis in	analysis (big	preparation and	defense of the

			accordance with the specific activities carried out within the framework of teamwork.	data) in the preparation and defense of the thesis in accordance with the specific activities carried out within the framework of teamwork.	defense of the thesis in accordance with the specific activities carried out as part of teamwork.	thesis in accordance with the specific activities carried out within the framework of teamwork
PC.4. Able	e to perform tactical	management of planning a	and organization of pr	oduction		
PC.4.1	Plans and organizes the execution of typical tactical production management activities	To know the methods and models of typical works of tactical production management and use them in accordance with the assignment for the GQW. To be able to plan and organize the performance of typical works by analyzing the models of the corresponding business processes; To have the skills of modeling business processes for planning	Does not know the methods and models of typical works of tactical production management and does not use them in accordance with the assignment for the GQW. Does not know how to plan and organize the performance of typical works, analyzing the models of corresponding business processes;	Partially knows the methods and models of typical works of tactical production management and uses them in accordance with the assignment for the graduate qualification. Partially able to plan and organize execution of typical works, analyzing models of	In general, with some gaps, knows the methods and models of typical works of tactical production management and uses them in accordance with the assignment for the GQW. In general, the ability to plan and organize the implementation of typical works, analyzing the models	Fully knows the methods and models of typical works of tactical production management and uses them in accordance with the assignment for the GQW. The ability to plan and organize the implementation of typical works, using models of business processes is formed at a high level; In general the
		and organizing the performance of typical	Does not have the	corresponding	of the corresponding business processes is	skills of modeling

	works on the tactical management of production.	business processes for planning and organizing the performance of typical works on tactical production management.	Fragmentary has skills of modeling business processes for planning and organizing execution of typical works on tactical production management.	formed with some remarks; In general, the skills of modeling business processes for planning and organizing the implementation of typical works on tactical production management.	organizing the implementation of typical works on tactical production management are formed.
PC.4.2 Develops analytical materials and reports to assess the activities of the business as a whole and the production units of the organization, implements procedures for accounting, analysis and control of the implementation of planned targets	To know economic- mathematical, statistical methods and tools for the development of analytical materials in the preparation and implementation of the graduate qualification. To be able to compile reports based on the developed analytical materials to assess the activities of the business as a whole and the production units of the organization; To master technologies of implementation of automated procedures for accounting, analysis and	Does not know economic- mathematical, statistical methods and tools for the development of analytical materials in the preparation and implementation of graduate qualification. Does not know how to make reports based on developed analytical materials to assess the activities of the business as a whole and the production units of the	Partial knowledge of economic- mathematical, statistical methods and tools for the development of analytical materials in the preparation and implementation of the graduate degree program. Partially able to prepare reports on the basis of developed analytical materials to assess the activities of the business as a whole	In general, with some gaps knows economic- mathematical, statistical methods and tools for the development of analytical materials in the preparation and implementation of the graduate degree program. In general, is able to prepare reports on the basis of developed analytical materials to assess the activities of the business as a whole and the production	economic- mathematical, statistical methods and tools for the development of analytical materials in the preparation and implementation of the graduate degree program. Generally able to prepare reports on the basis of developed analytical materials to assess the activities of the business as a whole and the production

		control of execution of	organization;	and the production	units of the	organization;
		planned tasks.	Does not know the	units of the	organization;	At a high level owns
		plained tasks.	technologies of	organization;	For the most part	technologies of
			implementation of	Fragmentarily	owns technologies of	implementation of
			automated	owns technologies	implementation of	automated
				0	1	
			1	of implementation		procedures of
			accounting, analysis	of automated	procedures for	accounting, analysis
			and control of the	procedures of	accounting, analysis	and control of
			execution of planned	accounting,	and control of	execution of planned
			tasks.	analysis and	execution of planned	tasks.
				control of	tasks.	
				execution of		
				planned tasks.		
PC.5. Abili	ty to analyze requir	rements				
PC.5.1.	Analyzes	To know the models of	Does not know the	Partial knowledge	In general, with	Fully knows the
	functional and	classification of	models of	of the models of	some gaps, knows	models of
	non-functional	requirements for the IS,	classification of	classification of	the models of	classification of
	requirements for	methodologies and	requirements for the	requirements for	classification of	requirements for the
	the IS.	standards governing the	IS, methodologies	the IS,	requirements for the	IS, methodologies
		work with requirements	and standards	methodologies and	IS, methodologies	and standards
		in the preparation and	governing the work	standards	and standards	governing the work
		execution of the GQW;	with requirements in	governing the work	governing the work	with requirements in
		To be able to analyze the	the preparation and	with requirements	with requirements in	the preparation and
		functional and non-	execution of the	in the preparation	the preparation and	execution of the
		functional requirements	GQW;	and execution of	implementation of	GQW;
		for the IS in the	Does not know how	the GQW;	the GQW;	The ability to
		preparation and	to analyze functional	Partially knows	The ability to	analyze functional
		execution of the thesis;	and non-functional	how to analyze	analyze functional	and non-functional
		To be able to analyze the	requirements for the	functional and non-	and non-functional	requirements for the
		requirements for the IS	IS as part of the	functional	requirements to the	IS within the
		as part of the preparation	preparation and	requirements for	IS in the preparation	preparation and

	and execution of	the	execution	of	the	the IS	in	the	and execution of the	execution of the
t	thesis.		thesis;			preparati	on	and	thesis is formed with	thesis is developed at
			Does not	know 1	how	execution	n of	the	some gaps;	a high level;
			to anal	yze	the	thesis;			Generally able to	In general, at a high
			requiremen	nts for	the	Partially	k	nows	analyze the	level of skill to
			IS as pa	rt of	the	how to a	analyz	the the	requirements for the	analyze the
			preparation	1	and	requirem	ents	for	IS as part of the	requirements for the
			execution	of	the	the IS as	part	of the	preparation and	IS as part of the
			thesis.			preparati	on	and	execution of the	preparation and
						execution	n of	the	thesis.	execution of the
						thesis.				thesis.
Criteria for assessing lea	Criteria for assessing learning outcomes		unsatis	factor	y	satis	factor	ry	good	excellent

## **6.2 Evaluation indicators for the graduate qualification work**

Assessment indicators for evaluating the graduate qualification work are determined by a set of the following criteria:

- relevance, problem and originality of the theme (UC.1.2, UC.1.3, GPC.1.5, GPC.3.2, GPC.3.3; GPC.6.2, UC.13.1, UC.13.2);

- Culture of presentation, compliance with requirements for design (UC.4.3; GPC.2.1, GPC.2.2, GPC.3.4; PC.2.1);

- compliance of the content of the graduation thesis with the theme, stated goals and objectives (UC.2.3, GPC.3.1, PC.2.2, PC.2.3, UC.13.3);

- logic of presentation, interrelation of all chapters (GPC.7.2; GPC.7.3);

- volume, nature and quality of sources used (GPC.6.2);

- validity of conclusions, their depth, originality (GPC.1.3, GPC.1.4, GPC.8.2, GPC.9.2, PC.3.1, PC.4.1, PC.4.2)

- validity of recommendations, taking into account their feasibility and expected effects (PC.5.1);

- Use of modern digital technologies (GPC. 2.1, GPC. 2.2, GPC. 4.2, GPC. 8.1, GPC. 10.1, GPC. 10.2, PC. 3.2)

- report (UC.5.3, UC.6.1, UC.6.2, UC.9.1, UC.9.2, UC.10.1, UC.10.2, UC.10.3)

- answers to the questions (comprehension, confidence, argumentation, quantity, other) (UC.3.1, UC.3.2, UC.8.1, UC.8.2, UC.8.4, UC.12.1, PC.3.5)

- general impression of the defense (UC.1.2, UC.1.3, GPC.3).

The results of the defense of the graduate qualification work are determined by grades "excellent", "good", "satisfactory", "unsatisfactory" and announced on the same day after the registration in the prescribed manner minutes of the meetings of the SEC. Minutes of the meeting of the State Attestation Commission are filled out for each student, where the topic of the graduate qualification work, the name of the supervisor and reviewer, the questions asked after the defense, the level of the student's answers to them, evaluation is recorded and the decision on assigning or not assigning the qualification "Academic Bachelor" is made.

A grade of "**excellent**" is given if:

a) the work is designed in full accordance with the requirements;

b) the theme of the work is problematic and original;

c) the content of the work reveals the stated topic, there is a solution to the problems set in the introduction;

d) the theoretical and practical parts of the work are organically interconnected;

e) the work on the basis of the study of a wide range of diverse sources is given independent analysis of theoretical and factual material;

f) the work contains elements of scientific creativity, independent conclusions are made with serious argumentation;

g) the work contains substantiated recommendations, the expected effects are defined;

h) at the defence, the graduate demonstrates fluency in the material, knowledge of theoretical approaches to the problem, correctly and completely answers additional questions.

A "**good**" grade is awarded if:

- if during the performance of points a); c); d); e); g) insufficient independent analysis is noted, and the theme of the work is standard and unproblematic.

The grade "**satisfactory**" is given in the case:

- if during the performance of points a) and c) and with the correct overall coverage of the topic noted:

- weak base of the studied sources;

- lack of independent analysis of the literature and factual material;

- poor knowledge of theoretical approaches to solving the problem and the works of leading scientists in the field;

- insufficiently prepared defense of the work, the absence of answers to a significant part of the questions.

The mark "**unsatisfactory**" is given in the case:

- if the work is admitted to the defense by the supervisor and the head of the department, but the student at the defense can not argue the conclusions, give evidence to the theoretical provisions, does not answer the questions, i.e. he does not know the material of the topic.

Decisions of the State Attestation Commission are made at a closed meeting by a simple majority of votes of the commission members participating in the meeting, with the obligatory presence of the commission chairman or his deputy. If the number of votes is equal, the Chairman of the Commission (or the Deputy Chairman of the Commission) has a casting vote. The evaluation made by the commission is final and not subject to revision.

All decisions of the State Attestation Commission are documented in minutes signed by the chairman and members of the SAC.

The State Attestation Commission makes the decision to award a graduate a qualification (degree) in his or her field of study and to issue a state diploma of higher education based on the positive results of the final state attestation, as documented in the minutes of the examination commissions.

If during the study the student had 75% of the marks "excellent" and the rest not lower than "good", then the State Examination Commission may decide to issue the student a diploma with distinction if he or she defended the final qualifying work with "excellent" and passed the state exam with "excellent". The decision to award a diploma with distinction must be reflected in the report of the chairman of the SEC on the results of the commission and the minutes of the SEC on the results of the defense of the graduate qualification work.

# 7. The procedure for the preparing and conducting the state final certification for students with disabilities

For students with disabilities, the state final certification is carried out taking into account the features of their psycho-physical development, their individual capacities and health conditions (hereinafter - the individual features). In carrying out the state final certification, the following general requirements are ensured:

- conducting the state final attestation of students with disabilities in the same classroom together with other students, if it does not create difficulties for students with disabilities and other students in passing the state final attestation;

- presence of the assistant (assistants) in the auditorium, who provides students with disabilities with the necessary technical assistance taking into account their individual characteristics (to take the workplace, move around, read and complete the task, communicate with the chairman and members of the State Examination Commission);

- to use the necessary technical means for students with disabilities when passing the state final certification, taking into account their individual characteristics;

- providing students with disabilities with unimpeded access to classrooms, restrooms and other rooms, as well as their stay in these rooms (availability of ramps, handrails, widened doorways, elevators, in the absence of elevators classrooms should be located on the first floor, availability of special chairs and other devices).

The student with disabilities no later than 3 months before the state final examination shall submit a written statement to the dean's office of the faculty, implementing the program, on the need to create special conditions for him during the state certification tests with an indication of his individual characteristics.

At the written request of a student with a disability, the duration of the state certification test may be extended for the student with a disability.

#### Section 1. Methods of optimal solutions

1. Mathematical programming.

2. Analysis of functions of one variable in the vicinity of a point: increment, derivative, elasticity, marginal values in economics

3. Analysis of a function of one variable on an interval: monotonicity and convexity.

4. Extremum of a function of one variable. Necessary and sufficient conditions of extremum. The concept of conditional and unconditional extremum.

5. Analysis of functions of several variables in vicinity of a point: increments, partial derivatives, gradient, Hesse matrix.

6. Analysis of functions of several variables on an interval: convexity of functions of several variables (FSV), criteria of convexity.

7. Unconditional extremum of FSV. Necessary and sufficient conditions for the extremum of FSV.

8. Conditional extremum of FSV (classical problem of mathematical programming). Lagrange method. Necessary and sufficient conditions of extremum of FSV.

9. The linear programming problem. The general statement of the problem.Methods for solving linear programming problems: graphical, simplex method.10. Duality in linear programming.

#### Section 2. Econometrics and econometric modeling

1.A general approach to the construction of interval statistical estimates of parameters. Interval estimates of parameters of a normal distribution.

2. General Linear Observational Model (GLMO) with classical assumptions (scalar and matrix forms). Least Squares Method (MLS) and its geometrical interpretation in case of GLMO. Gauss-Markov theorem for GLMO.

3. Quality analysis of a multiple linear regression model using coefficient of determination and adjusted coefficient of determination. Information criteria. Student's t test for significance of model parameters and Fisher's test for significance of model. Application of p-value when testing statistical hypotheses.

4. Formulation of the general linear hypothesis. Substantive examples of linear hypotheses: about significance of coefficients; about significance of regression model as a whole, to test properties of Cobb-Douglas function, etc. F-statistics for testing the linear hypothesis. Its record in matrix form, as well as using the residual sum of squares or coefficient of determination.

Continuation of Appendix 1

5. Possible deviations from the assumptions of the classical GLMO: autocorrelation, heteroscedasticity of different observations; law of a distribution other than normal. Informal methods of their detection, possible economic causes of occurrence.

6. The nature of the problem of heteroscedasticity. Types of heteroscedasticity. Consequences of heteroscedasticity. Ways to detect heteroscedasticity. Methods for overcoming heteroscedasticity.

7. The problem of multicollinearity. Complete and partial multicollinearity. Signs of multicollinearity. The variance inflation coefficient VIF. Methods to eliminate multicollinearity.

8. Linear probability model. Binary choice models: logit analysis and probit analysis. Calculation of marginal effects and estimation of predictive quality of models.

9. Time series. Basic concepts and definitions. Univariate models of time series. The concept and structure of time series. Trend and seasonality analysis. Smoothing of time series.

10. The concept of stationarity. Weak and strict stationarity. Testing the presence of unit roots. First-order autoregression model, its stationarity test and derivation of autocovariance function under classical assumptions.

11. Shift (lag) operator. Reversibility of polynomials from shift operator. The characteristic equation and its roots.

12. Models of the ARIMA class. Stationarity and reversibility conditions for ARMA (p,q) series. Estimation and checking the adequacy of ARIMA models.

#### Section 3. Optimal control theory

1. Extreme problems. A brief historical overview with examples of specific extreme problems.

2. Tasks of the classical calculus of variations. The general idea of the method of variations.

3. Necessary conditions for weak local minimum in the simplest problem of calculus of variations. Euler's equations. Examples.

4. The Dubois-Raymond lemma. Application to the derivation of necessary conditions of extremum in problems of the calculus of variations.

5. Formulation of Pontryagin's maximum principle. Problem of optimal control with free right end of trajectory.

6. Application of Pontryagin's maximum principle to the problem of optimal control of one-industry economy.

7. Sufficient conditions of optimality. Proof of the main theorem.

8. Generalized theorem on sufficient optimality conditions.

9. The solution of the problem of optimal control for a model of macroeconomics with a Cobb-Douglas production function.

10. Synthesis of optimal control. The Hamilton-Bellman method.

#### Section 4. Mathematical models of economics and their study

- 1. Production functions.
- 2. Consumer behavior in the market.
- 3. Formulation and derivation of the Slutsky equation.
- 4. Spider-web models of consumer theory.
- 5. Continuous models of consumption theory (Walrasian-Evans-Samuelson).
- 6. Static models of macroeconomics.
- 7. Dynamic models of macroeconomics.
- 8. Solow's model.

9. The problem of optimization of specific consumption in the Solow-Swain model. "Phelps's Golden Rule of Accumulation.

#### Section 5. General issues of business informatics

1. Information and information processes. Approaches to measuring information. Principles of information representation (numerical, textual, graphical, etc.) in computing systems. 2.

2. The database as an information model of the subject area. The concept of ANSI/SPARC architecture. Types of logical data models. The concept of "DBMS". Architecture models: "File Server" and "Client Server".

3. Relational model. The main SQL operators. Index search in the database. Data access technologies. 4.

4. Object-oriented analysis and design.

5. Programming technologies. Translators. Basic structures of algorithms. Data structures and their processing. OOP mechanisms. Modern tools for fast application development.

6. Classical architecture of computer systems (von Neumann principles). Modification of classical architecture principles in modern computers.

7. The concept of operating systems, their purpose and types. The functions of operating systems. Flows and processes. Mechanism of interruptions as the basis for multitasking of operating systems.

8. Network technologies.

9. Enterprise architecture. Basic notions and models

10. Basic concepts of project management. Project management standards.

#### Section 6. Information technology in economics.

1. Basic concepts of economic information systems: MRP, ERP, APS, CSRP, CRM, etc. Corporate information systems.

- 2. The concept of data warehouses.
- 3. Notations and tools for modeling business processes.
- 4. Decision support systems (DSS). Structure of DSS.
- 5. Information-analytical systems (IAS). Typical tasks of business analytics.
- 6. Intelligent data analysis (Data Mining), expert systems.

Example of a ticket for the State Exam

Ministry of Science and Higher Education of the Russian Federation

Federal State Autonomous Educational Institution of Higher Education "Perm State National Research University"

#### FACULTY OF ECONOMICS DEPARTMENT OF INFORMATION SYSTEMS AND MATHEMATICAL METHODS IN ECONOMICS EXAMINATION TICKET NO._1_ <u>STATE QUALIFYING EXAMINATION</u> for the direction of 38.03.05 ''Business Informatics''

1. Formulation of the general linear hypothesis. Substantive examples of linear hypotheses: on the significance of coefficients; on the significance of the regression model as a whole, to test the properties of the Cobb-Douglas function, etc. F-statistics for testing the linear hypothesis. Its record in matrix form, as well as using the residual sum of squares or coefficient of determination.

2. Basic principles of OOP. The concept of classes and objects, their properties and methods. Modern Rapid Application Development (RAD) tools.

3. Case study.

Chairman of SEC ______ R.A. Faizrakhmanov

Head of the Department of Information Systems and mathematical methods in economics______ M.V.Radionova

#### Sample topics of graduate qualification works for Bachelor's degree program 38.03.05 "Business Informatics"

1. External environment: models of business processes of the enterprise and their analysis

2. Development of the information subsystem "Title"

3. Methods for assessing the innovative intellectual potential of the enterprise

4. Development and implementation of the model of economic development of the region in the analytical complex "Name"

5. Architecture of sanatorium and resort complex of Perm Krai

6. Benchmarking the financial activities of chemical enterprises in Perm Krai based on panel data

7. Improving the management system of healthcare institutions in Russia on the basis of cluster analysis

8. An Agent-Based Approach to Modeling Innovation Processes

9. Modeling Quality of Life: Data Analysis

10. Adaptive models: analysis and forecasting in economic systems

11. Modern models of asset price forecasting

12. Investigation of the structure of time series of average monthly values of the exchange rate

13. Econometric Analysis of GDP

14. Econometric Analysis of the Used Car Market

15. Analysis of Factors Affecting the Innovation Activity of Organizations in Perm Region

16. Application of Simulation Modeling for Researching Demand in the Cellular Communication Market

17. Modeling the Australian Economy

18. Econometric Analysis of Unemployment in the USA

19. Creating a forecasting tool based on the analysis of influence factors on the blue chip index of the Moscow Stock Exchange

20. Quantitative methods for assessing the impact of ICTs on socio-economic indicators of Russian regions

21. Modeling inflation in Russia

22. Econometric model of demand for inbound tourism

23. Analysis of the impact of factors on the gross regional product of the subjects of the Russian Federation

24. Analysis of life expectancy and factors influencing it in different regions of the world

25. The impact of inflation on the UK economy

26. Analysis of the relationship between GDP and factors: services, manufacturing, industry, construction, mining, agriculture, manufacturing (crude oil), industry - in the United States, Japan, Russia, Germany

27. Estimation of the regression model of the dependence of expenditures on education on GDP and population size with consideration of heteroscedasticity of random perturbations

28. Econometric analysis of the applicability of the Fisher equation to the Canadian economy

29. Analysis of Factors Affecting Diamond Pricing

30. Optimizing Market Behavior of Small Manufacturing Companies from a Game Theory Perspective

- 31. Influence of exchange rate on Russian-Chinese trade
- 32. Empirical Models of Actuarial Data
- 33. Statistical methods of reserve estimation
- 34. Classical methods of actuarial model selection
- 35. Methods of Selecting Complex Actuarial Models
- 36. Actuarial Valuation of Insurance Pension Schemes
- 37. Bond portfolio analysis, duplicate and arbitrage bond portfolios

38. Modeling investment processes within dynamic models for panel data in the R software environment

39. Applying externally unrelated systems of equations to model investment processes

40. A model for estimating the value of national currency in units of time

41. A model for estimating the probability of random events and their impact on the financial performance of an economic system

42. New information technologies and their impact on the state and structure of international trade.

43. Virtual economy and its impact on the production economy

44. Automation of methods of assessing the effectiveness of investment projects

45. Analysis of the competitiveness of an enterprise based on the theory of decision-making

46. Forecasting Financial Time Series on the Basis of Machine Learning Methods

47. Predicting Time Series Using Wavelets.

48. Development of an automated system for rating assessment of teachers and researchers of the university

49. Development and research of models and mathematical methods for analysis of microeconomic processes and systems: firms and enterprises, and methods of quantitative assessment of entrepreneurial risks and justification of investment decisions

50. Mathematical models of financial markets

- 51. Qualitative (Qualitative) Analysis of Markets and Economies
- 52. Mathematical models of bankruptcy of enterprises

Continuation of Appendix 3

53. Evaluating the effectiveness of online marketing campaigns

54. An Analysis of the Welfare of the Population of Russia's Regions (Perm Territory, the City of Perm, etc.).

55. Analysis and forecasting the load on different categories of information system users

56. Elaboration of models of expert assessments of the staff competences (the results may be statistical models of expert data processing, possible application of fuzzy sets apparatus, decision-making models, multidimensional optimization).

57. Development of models and algorithms for analysis of the results of pedagogical testing (using methods of pedagogical qualimetry, probabilistic-statistical models)

58. Assessment of accessibility of medical care in Russia by methods of cluster and regression analysis

59. Modeling of the influence of technical-economic and socio-demographic factors on the total floor area of commissioned residential buildings

60. Modeling the Level of Digitalization of Society in the Russian Federation

61. Analysis of factors influencing the number of students: an econometric approach

62. Assessing the Sustainability of the Regional Budget on the Example of the Perm Territory

63. Designing the module "My Health" of the Unified State Health Information System

64. The development of CRM system of small business on the Greendata platform

65. Analysis and modeling of gold prices in the foreign exchange market

- 66. Econometric Modeling of the Labor Market in the Russian Federation
- 67. Modeling of Bank Defaults

68. Assessing the Impact of Key Indicators of Socio-Economic Development on the Happiness Index

- 69. Designing the information system "Perm Krai Graffiti Monitoring"
- 70. Designing the Information System
- 71. Designing of applied intellectual systems
- 72. Modeling of economic processes and systems
- 73. Mathematical modeling of socio-economic systems
- 74. Machine learning methods
- 75. Quantitative methods of research of socio-economic systems
- 76. Modeling of socio-economic time series
- 77. System analysis of socio-economic systems
- 78. Dynamic models of economics
- 79. Business analysis of information.
- 80. Structural analysis

- 81. Modeling of socio-economic time series
- 82. System analysis of socio-economic systems
- 83. Web technologies in economics
- 84. Application of neural networks to financial market calculations
- 85. Neural network modeling and technology
- 86. Risk Situation Modeling
- 87. Mathematical methods and technologies for big data processing
- 88. Methods and computer technology for simulation modeling
- 89. Methods of system dynamics
- 90. Methods and models for multivariate data analysis
- 91. Modern IT-technologies of development and analysis of financial processes
- 92. Development of business architecture of enterprises
- 93. Digital transformation of enterprises
- 94. Statistical research methods in economics
- 95. Methods and models of engineering economics
- 96. Econometric modeling of socio-economic systems and processes
- 97. Numerical methods: analysis of economic processes
- 98. IoT application development
- 99. Application of information and communication technologies in the analysis
- of socio-economic processes in the digital economy
- 100. Ontological Engineering and Applied Ontologies in Business
- 101. Modeling Based on Fuzzy Logic
- 102. Multivariate data analysis
- 103. Designing an enterprise information technology architecture
- 104. Agent-Based Modeling
- 105. Project Development of Digital Business Transformation
- 106. Software Design
- 107. Analysis of methods and software tools
- 108. Systems and risk management models
- 109. Information flow analysis and modeling

# *NORM-CONTROL of the graduate qualification work*

Normo-control is carried out to determine the compliance of the work with current methodological guidelines for the execution and design of graduate qualification work. Normo-control is conducted by the supervisor at the stage when the student submits a fully completed work. This checklist is attached to the thesis.

Theme of GQW _____

	Student		
No. Object of control n/a		Parameters	Conform: + not matching:
1	Topic of work	corresponds to the topics approved by the university (specified in the supervisor's assignment)	
2	Font size	12 point	
3	Font name	Times New Roman	
4	Line spacing	1,5	
5	Paragraph	1,25	
6	Margins (mm)	left 25mm, right 15mm, top and bottom 20mm.	
7	Total volume without appendices	60-80 pages	
8	Scope of introduction	3-5 pages	
9	Scope of the conclusion	3-5 pages	
10	Scope of the main part	50-60 pages	
11	Bibliography	at least 30-40 sources, including normative legal acts, books, monographs, manuals, periodicals, Internet resources, etc. Literature not older than 3-5 years	
12	References	in square brackets, given for all sources of literature	
13	Page numbering	at the bottom center of the page	
14	Content and design of the structural parts of the work	The work has three chapters, each of which includes at least three paragraphs. Each chapter begins on a new page, the paragraphs continue on the same page.	
15	Table formatting	Tables are signed at the top. The word "table" on the left side of the page. The title is placed under the word "table" in the center, font 12, spacing 1.5. Text of the table: font 12, line spacing 1.0. Numbering is continuous within the chapter	
16	Drawing design	All illustrations are referred to as figures, numbering is continuous within the chapter. They are placed under the figure in one line (Fig.1.1. Title or Fig.1. Title)	
17	The formatting of the reference list	In accordance with SAST R 7.0.100-2018 "Bibliographic record. Bibliographic description. General requirements and drawing up rules".	
18	The originality of the work	At least 60%	
19	Availability of mandatory documents	Assignment for GQW, supervisor's review, Anti-plagiarism report, illustrative material (5 copies), electronic version of GQW for placement in UTIS, normative control sheet	
-	W supervisor	/	

I have got acquainted with the results of the norm-control: Student_____

Sample assignment for fulfillment of graduate qualification work

#### MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION Federal State Autonomous Educational Institution of Higher Education "Perm State National Research University"

Faculty of Economics

Department of Information Systems and Mathematical Methods in Economics

#### ASSIGNMENT FOR THE GRADUATE QUALIFICATION WORK

Student_

full-time department of the Faculty of Economics of the bachelor degree direction 38.03.05 "Business Informatics"

#### I. Topic of the graduate qualification work

approved by the decision of the department from "____"___20__ protocol №____

#### II. The deadline for the student's completed work

"______20_____20_____

#### III. Input data to the work

1		 	
2	 	 	
3	 	 	
J	 	 	
4	 	 	

#### IV. Main sections and issues under development

2._____

1._____

#### V. Timetable

3._____

Section	Deadline	Section	Deadline

### VI. Consultants for specific sections of work

Date of assignment ""	20	
Head of the Department of Information Systems and mathematical methods in economics		Radionova M.V.
Academic advisor		

Sample title page of graduate qualification work

# MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

Federal State Autonomous Educational Institution of Higher Education "Perm State National Research University"

Faculty of Economics

Department of Information Systems and Mathematical Methods in Economics

#### **GRADUATE QUALIFICATION WORK**

#### **Topic title**

Admissible for defence: Head of the Department of Information Systems and Mathematical Methods in Economics Candidate of Phys&Math Sciences, Associate Professor _____M.V. Radionova

« » 20

Executor - 4th year student full-time education Bachelor's 38.03.05 "Business Informatics" direction

(signature) (Full name) «_____»____20___

Academic advisor

(position, scientific degree)

(signature) (Full name) «_____»____20___

Scientific advisor (if applicable)

(position, scientific degree)

(signature) (Full name) «______ 20___

Perm 20____

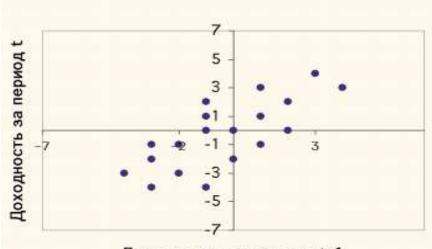
#### A Sample Table of Contents of graduate qualification work

In the table of contents of the title of chapters and paragraphs of work given without quotation marks, an indication of the page from which begins the relevant part of the work is mandatory. Introduction and conclusion of the work should not have any additional titles.

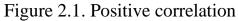
#### **Table of contents**

Introduction	3
Chapter 1 Chapter Title	5
1.1 Title of paragraph	. 5
1.2 Title of paragraph	. 11
Chapter 2 Title of chapter	18
2.1 Title of paragraph	. 18
2.2 Title of paragraph	. 25
Chapter 3 Title of chapter	. 45
3.1 Title of paragraph	. 45
3.2 Title of paragraph	. 52
Conclusion	. 60
List of references	. 63
Appendices	. 65





Доходность за период t-1







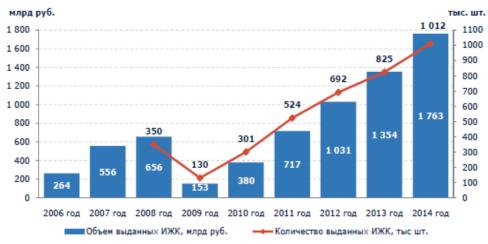


Fig. 1.1. Dynamics of the volume and number of issued mortgage loans in 2006-2014

### A sample of table design

Table 2.1

MA1	Profit/Loss	MA1	Profit/Loss
1	-14,000	9	-8,000
2	-16,000	10	4,000
3	-12,000	11	6,000
4	-8,000	12	6,500
5	-500	13	7,000
6	12,000	14	5,000
7	3,000	15	4,500

#### Results of optimization of one moving average

#### Table 1.1

#### Calculation of profitability, in millions of dollars

Indicators	2014	2013	Change,%
Revenue	11 869,00	11 499,00	3,22
Gross profit	6 195,00	4 993,00	24,07
Gross profit margin	52,19	43,42	8,77
Selling expenses	335,00	445,00	-24,72
Administrative Expenses	812,00	964,00	-15,77

A sample of the list of references

#### List of references

- 1. Alexeev E.R., Chesnokova O.V. Problem solving in computational mathematics packages Mathcad 12, MATLAB 7, Maple 9. 496 c.
- Andrianov D.L., Arbuzov V.O., Ivliev S.V., Maksimov V.P., Simonov P.M. Dynamic models of economics: theory, applications, software implementation // Vestnik of Perm University. Series Economics. 2015. Vyp. 4(27). C. 8-32.
- Vorobyov O.E. Modeling the dynamics of credit and investment activity of small enterprises using the apparatus of differential equations. Dissertation for the degree of Candidate of Economic Sciences, specialty 08.00.13 / M., 2005. 96 c.
- 4. Kirillov A.N., Smirnov N.V. Modeling of small enterprise dynamics and optimal lending scheme // Proc. of Petrozavodsk State University. 2012. №3. C. 25-34.
- 5. Maksimov V.P. Modern Mathematical Methods in Economics. Problems of control and boundary value problems for linear systems / Perm: Perm State National Research University, 2014. 152 c.
- 6. Maksimov V.P. Management of financial flows in the task of achieving target indicators for multi-branch financial-production complex. URL: 2ff-vnpk-sfr-2019.pdf (psu.ru) (date of reference: 14.06.2019).
- Osinkin M.S. To the task of rational choice of credit programs for a small enterprise // Information systems and mathematical methods in economics : collection of scientific works / ed. by N.V. Frolova; Perm State National Research University. Perm, 2015. Vol. 7. P. 168-180.
- 8. Development of economic and mathematical modeling: Collection of scientific articles of the Department of MMAE under the general editorship of Professor M.V. Gracheva. Moscow: Victoria Grant TK, 2006. 156 c.
- 9. Savotchenko S.E., Kuzmicheva T.G. Methods of solving mathematical problems in Maple: Textbook / Belgorod: Publishing house Belaudit, 2001. 116 c.
- 10.Sdvizhkov O.A. Mathematics on the computer: Maple 8 / M.: SOLONPress, 2003. 176 c.
- 11. Chetyrkin E.M. Financial mathematics / M.: Delo, 2007. 397 c.
- 12. Shkuratov S.E. Crediting of small innovational enterprises: peculiarities and prospects of development // the Money and credit. 2006. №10. C.23-46.
- 13.Andrianov D.L., Arbuzov V.O., Ivliev S.V., Maksimov V.P., Simonov P.M. Economic dynamic models: theory, applications, computer aided implementation // Perm University Herald. Economy. 2015. No. 4. P. 33-53.

- 14.Chadov A.L., Maksimov V.P. Linear boundary value problems and control problems for systems with continuous and discrete times // Functional Differential Equations. 2012. V. 19. No. 1-2. P. 49-62.
- 15.Maksimov V.P. Control of functional differential systems in conditions of impulse disturbances // Russian Mathematics (Iz. VUZ). 2013. V. 57. No. 9. P. 58-61.

#### Sample of the supervisor's review

#### MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION Federal State Autonomous Educational Institution of Higher Education "Perm State National Research University"

#### Faculty of Economics

Department of Information Systems and Mathematical Methods in Economics

#### ACADEMIC ADVISER'S REVIEW

Final qualifying work is fulfilled by Student ______ (Full name) full-time department of Economics Faculty of Bachelor's degree direction 38.03.05 "Business Informatics"

#### Subject of the graduate qualification work

Then, in any form, the supervisor notes the following and other main qualities of the student and his graduate qualification work:

- $\checkmark$  relevance of the chosen topic;
- $\checkmark$  correspondence of the content of the graduate qualification work with the stated goal;
- $\checkmark$  the main merits of the work;
- $\checkmark$  the independence of the bachelor's work;
- $\checkmark$  compliance with the deadlines for completion of the thesis;
- $\checkmark$  the quality of design of the thesis;
- $\checkmark$  ability of the student to analyze the state of the problems to be solved;
- $\checkmark$  the degree of mastery of mathematical apparatus and computer technology;
- $\checkmark$  the degree of completeness of the solution to the problems;
- $\checkmark$  the level, correctness and depth of the proposed solutions;
- ✓ clarity, precision, style and literacy level of presentation of the research results;
- ✓ the results of the check of the graduate qualification work for antiplagiarism;
- $\checkmark$  the advantages and disadvantages of the graduate qualification work.

Closing sentence:

The submitted graduate qualification work in terms of structure, volume and content of sections, depth of material ______ (meets, does not meet) the requirements for the graduate qualification work of the student, indicating ______ (high, basic, threshold, insufficient) level of competence formation and deserves ______ (excellent, good, satisfactory, unsatisfactory) assessment. ______

Full name deserves a bachelor's degree in 38.03.05 "Business informatics" focus area "Information systems and big data".

Supervisor of GQW Surname and first name, scientific degree, scientific rank, position

(signature) « » 20

**Appendix 12** Sample label for hardcover graduate qualification work

А. В. Иванов

6 cm

THE THEME TITLE

8 cm

#### PROGRAM FOR THE STATE FINAL CERTIFICATION

Co-authors:

Andrey Borisovich Byachkov Ivan Vadimovich Ilyin Vladimir Petrovich Maksimov Marina Vladimirovna Radionova Natalia Vladimirovna Frolova Dmitry Victorovich Shimanovsky

## PROGRAM OF THE STATE FINAL CERTIFICATION FOR THE GRADUATES OF THE BACHELOR DEGREE IN 38.03.05 "Business Informatics" FOR CORRESPONDENCE TO THE REQUIREMENTS OF SELF-ESTABLISHED STANDARD OF HIGHER EDUCATION OF PSNRU

Published in the author's edition