APPROVED
at a meeting of the Academic Council of
NJSC «KazNU named after al-Farabi»
Protocol № 11 from 23. 05. 2025 y.

The program of the entrance exam for applicants to the PhD for the group of educational programs D130 – Standardization and Certification (by industry)

I. General provisions

1. The program was drawn up in accordance with the Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 600 «On Approval of the Model Rules for Admission to Education in Educational Organizations Implementing Educational Programs of Higher and Postgraduate Education» (hereinafter referred to as the Model Rules).

2. The entrance exam for doctoral studies consists of writing an essay, an exam in the profile of a group of educational programs and an interview.

Блок	Баллы
1. Interview	30
2. Essay	20
3. Exam according to the profile of the group of the educational program	50
Total admission score	100/75

3.The duration of the entrance exam is 3 hours 10 minutes, during which the applicant writes an essay and answers the electronic examination ticket. The interview is conducted at the university premises before the entrance exam.

II. Procedure for the entrance examination

1. Applicants for doctoral studies in the group of educational programs D130 – Standardization and Certification (by industry) write a problematic / thematic essay. The volume of the essay is at least 250 words.

The purpose of the essay is to determine the level of analytical and creative abilities, expressed in the ability to build one's own argumentation based on theoretical knowledge, social and personal experience.

Types of essays:

- motivational essay revealing the motivation for research activities;
- scientific-analytical essay justifying the relevance and methodology of the planned research;
- problem/thematic essay reflecting various aspects of scientific knowledge in the subject area.

2. The electronic examination card consists of 3 questions

Topics for exam preparation according to the profile of the group of the educational program:

Discipline: Quality Management Systems

Topic 1.1. Main tasks and objectives of product quality management.

Subtopics 1.1.

The concept of quality.

The importance of product quality for consumers and manufacturers. Product quality indicators and the principles of their formation.

The problem of product quality and its connection with other problems of the market economy.

Topic 1.2. General principles of building quality management systems.

Subtopics 1. 2.

Basic principles of managing various systems.

Stages of quality improvement as the basis for forming the principles of a quality management system.

Basic principles of building quality management systems.

Postulates of the concept of quality and the development of a company's quality policy.

Topic 1.3. Criteria for the effectiveness of quality management systems.

Subtopics 1.3.

General issues of assessing the effectiveness of quality management systems.

Economic criteria for assessing the effectiveness of quality management systems.

Methodology for assessing the effectiveness of enterprise (organisation) quality management systems.

Assessment of the quality of innovative projects.

Topic 1.4. Composition of quality management subsystems and their formation.

Subtopics 1.4.

Quality management system as a subsystem of enterprise management.

Product life cycle and basic concepts of quality management systems.

Formation of quality management subsystems within the framework of total quality management (TQM).

Topic 1.5. Organisation, verification, analysis, assessment and certification of quality systems.

Subtopics 1.5.

ISO 9000 international standards as the basis for the creation and development of quality management systems in organisations.

Organisation of work on the creation of a quality system. Development and implementation of a QMS.

Verification of quality systems.

Discipline: Statistical Methods of Control and Management

Topic 2.1. Statistical Methods of Product Quality Control and Management.

Subtopics 2.1.

Fundamentals of Statistical Analysis.

Statistical Quality Control.

Product Quality Assessment.

Ishikawa Cause-and-Effect Diagram.

Pareto Analysis.

Histograms.

Quality control using statistical methods of technological process regulation. Types and methods of statistical regulation of technological process quality.

Statistical acceptance control based on alternative criteria.

Statistical acceptance control based on quantitative criteria.

Discipline: Standardisation and Product Certification

Topic 3.1. Fundamentals of standardisation. Methodological foundations of standardisation.

Subtopics 3.1.

Subject, objectives and structure of standardisation.

Standardisation in the context of developed market relations and the deepening of economic globalisation processes.

Methodological foundations of standardisation. Theory of standardisation.

Mathematical models and methods used in standardisation theory.

Main objectives, objects and methods of classification and coding in standardisation.

Principles and functions of standardisation.

Topic 3.2. Means of standardisation.

Subtopics 3.2.

National standards. Technical regulations.

Application of documents in the field of standardisation. Types of standards.

Technical conditions.

Topic 3.3. Standardisation systems.

Subtopics 3.3.

System of legislative and regulatory acts in the field of technical regulation. Economic and legal basis of standardisation.

Structure of a typical technical regulation.

State control and supervision of compliance with technical regulations.

Topic 3.4. Economic aspects of standardisation. Fundamentals of economic metrology.

Subtopics 3.4.

Economic and organisational foundations of product quality management.

Economic foundations of standardisation.

Economic aspects of metrology. Economic aspects of certification.

Assessment of competitiveness and technical and economic level of products.

Topic 3.5. International and regional cooperation in the field of standardisation.

Subtopics 3.5.

International organisation for cooperation in the field of standardisation.

Regional standardisation system of the European Economic Cooperation countries.

International cooperation of the EAEU countries. Directions for the development of standardisation in the EAEU.

Ensuring quality assurance, safety of goods in circulation and adequate protection of consumer rights.

Use of interstate standards (GOST) developed by the

Interstate Council for Standardisation, Metrology and Certification (MGS) of the CIS countries to implement the technical legislation of the EAEU.

Discipline: Standardisation and Conformity Assessment of Technological Processes

Topic 4.1. Technical Regulation.

Subtopics 4.1.

Principles of Technical Regulation.

Legal Basis for Technical Regulation. Technical Regulations.

State Control (Supervision) over Compliance with Technical Regulations.

Basic concepts in the field of conformity assessment. Objectives and principles of conformity assessment.

Voluntary conformity assessment. Mandatory conformity assessment.

Topic 4.2. Theoretical foundations of metrology.

Subtopics 4.2.

Objectives and tasks of metrology.

Physical quantities, their classification.

Measurement scales.

System of units of physical quantities.

Characteristics of measurements. Classification of measurements.

Measurement methods.

Measuring instruments. Classification of measuring instruments.

Standards. Metrological characteristics of measuring instruments.

Regulation of measurement uniformity. Forms of state regulation of measurement uniformity.

Verification of measuring instruments.

Calibration of measuring instruments.

Testing of standard samples or measuring instruments.

Metrological support.

Metrological organisations.

III. List of sources used.

Main:

1. Tebeikin, A.V. Quality Management. - Moscow: Yurait Publishing House, 2011. - 371 p.

2. Efimov, V.V. Quality Management Tools and Methods. - Moscow: KNORUS, 2010. - 232 p.

3. Gugelev, A.V. Standardisation, Metrology and Certification: Lecture Notes. Moscow: Higher Education, 2007. 210 p.

4. Askarov, E.S. Standardisation, Metrology and Certification: Textbook. - Almaty: Economics, 2011, 321 p.

5. Research of management systems: Mikhailov L.M., Mishin V.M., Sisyuk A.Ya. - Moscow: Exam Publishing House, 2009. - 189 p. (Series 'Textbook for universities')

6. Leonov O.A., Temassova G.N., Shkaruba N.Zh., Economics of Quality, Standardisation and Certification. – Moscow: INFRA – M. 2014. 251 p.

7. Raikova, E.Yu. Standardisation, Conformity Assessment, Metrology. Moscow: Textbook, - Moscow: Yurait Publishing House, 2014. - 349 p.

8. Metrology and Technical Measurements / E.G. Mironov, N.P. Bessonov. – Moscow: KNORUS, 2015. – 422 p.

9. Krokhin V.V. Metrology: Textbook for Universities. – Moscow: Logos, 2001. – 408 p.

10. Lifits I.M. Fundamentals of Standardisation, Metrology, Certification: Textbook. - Moscow: Yurait Publishing House, 2000. - 285 p.

11. Economics of Quality, Standardisation and Certification: Textbook. - Moscow:

INFRA-M, 2014. - 251 p. + Additional materials {Electronic resource. Access mode http://www.znanium.com}- (Higher education).

Additional:

1. Askarov E.S. Quality Management: Textbook. - Almaty: Lawyer, 2009, 3rd ed. – 292 p.

2. Agarkov A.P. Quality Management: Textbook. - Moscow: Dashkov and Co. Publishing and Trading Corporation, 2007. - 218 p.

3. Innovative Management of an Enterprise: A Textbook for University Students / Bazilevich, A.I.; edited by B.Ya. Gorfinkel. - Moscow: UNITY – DANA, 2009. – 231 p.

4. Novikov, A.M., Novikov, D.A. Methodology of Scientific Research. - Moscow: Knizhny Dom, LIBRICOM, 2010. – 280 p.

5. Farkhutdinov R.A. Production Management: Textbook for Universities. 6th ed. – St. Petersburg: 2011. -496 p. – (Series 'Textbook for Universities').

6. Environmental Quality Standards: Textbook/ N.S. Shevtsova et al.; edited by Prof. M.G. Yakovlev. - Minsk: New Knowledge; Moscow: INFRA-M, 2014. - 156. (Higher Education).