APPROVED
at a meeting of the Academic Council
of NJSC «KazNU named after al-Farabi»
Protocol № 11 from 23.05.2025 y.

Entrance Examination Program for Applicants to Doctoral Studies in the Educational Program Group D123 – "Geodesy"

I. General Provisions

1. This program is developed in accordance with the Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018, No. 600 "On the Approval of Standard Rules for Admission to Education in Organizations Implementing Educational Programs of Higher and Postgraduate Education" (hereinafter referred to as the Standard Rules).

2.The doctoral entrance examination consists of an interview, writing an essay, and a subject-specific examination.

Component	Points
1. Interview	30
2. Essay	20
3. Examination in the profile of the educational program group	50
Total / Passing score	100 / 75

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

II. Procedure for the Entrance Examination

1. **Applicants to the doctoral program** in the educational program group **D123 – "Geodesy"** are required to write a **problem-based / thematic essay**. The essay must be **at least 250 words** in length.

Purpose of the essay:
To assess the level of analytical and creative thinking, expressed through the ability to construct independent arguments based on theoretical knowledge, social, and personal experience.

Types of essays include:

- **Motivational essay** revealing the applicant's incentives for engaging in research;
- **Scientific-analytical essay** justifying the relevance and methodology of the planned research;
- **Problem-based / thematic essay** reflecting various aspects of scientific knowledge within the subject area.

2. The **electronic examination ticket** consists of **3 questions**.

Topics for preparation for the profile entrance exam in the educational program group:

1. Main requirements and functions of professionals in geodetic support of design.
2. Justification of the geodetic layout framework for construction through sign surveying methods.
3. Methods of creating and updating engineering topographic plans, considering the survey of underground utilities.
4. Justification of engineering surveys for preparing design tasks in construction and reconstruction.
5. Control and restoration of the geodetic layout framework in case of sign loss.
6. Methods of adjusting the geodetic leveling network on a construction site using stabilized working benchmarks.
7. Methods of adjusting the geodetic leveling network on a construction site using permanent benchmarks.
8. Geological and engineering-geological processes relevant to solving design problems.
9. Reasons for conducting engineering-hydrometeorological and engineering-environmental surveys during design.
10. Organization of engineering-environmental surveys in the construction area.
11. Differences between a Geographic Information System (GIS) and other types of information systems.
12. Definitions of GIS-related terms: “data,” “information,” and “knowledge.”
13. Independent definition of GIS.
14. Tasks for which the use of GIS is appropriate.
15. Technical components of GIS.

III. List of References Used

Main Sources:

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3. Раклов В.П. Географические информационные системы в тематической картографии. Учебное пособие. – М.: Академический проект, 2014. 4-е издание, 176с. ISBN - 978-5-8291-1616-3.

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Supplementary Sources:

1. Михайлов А.Ю. Инженерная геодезия в вопросах и ответах. Изд-во: Инфра-Инженерия, 2016. 200 с. ISBN - 978-5-9729-0114-2.

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5. М.Р. Владимирова, И.Ю. Алейникова, И.В. Калинина. Автоматизация топографических съёмок. Часть I. Работа с электронным тахеометром: Учебно-методическое пособие. — М.: МИИГАиК, 2018.— 36 с.

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