APPROVED
at the meeting of the Academic Council of NJSC Al-Farabi Kazakh National University
Protocol №14 dated 16.06.2026

The program of the entrance exam for applicants to the PhD for the group of educational programs D083 - «Geobotany»

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 D080 - «Biology» write a problematic / thematic essay. The volume of the essay is at least 250words.

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 "Current problems of geobotany

" Introduction to the discipline of Geobotany.
A brief history of geobotany, stages of development, objects of research.
Structure of phytocenoses.
The formation of phytocenoses, the relationship of plants with each other and with the environment. Daily and seasonal variability of phytocenoses in different years.
Ecological and phytocenotic optimum of the species.
Coenopopulation (quantity, age composition, projection coverage).
Elements of the functional structure of phytocenoses (cenocell, synusion, consortium).
Analysis of mosaic, sinusional, and consortial concepts.
Analysis of elements of the functional structure of phytocenoses. Stages of plant development (vegetation phases) and seasonal rhythmicity of phyto cenoses. The role of various forms of life in the phytocenosis.
Dynamics of phytocenoses.
Evolution of phytocenosis, succession, cataclysms. Endoecogenesis, syngenesis, and hologenesis.
Evolution of phytocenoses.
Phlorogenesis and phytocenogenesis.
Relict phytocenoses. Complete, partial, and heterogeneous relics.
Productivity of phytocenoses.
Biological products. Common first product, pure first product, and the product used by heterotropics. Products and biomass of the main ecosystems of the globe.
Geography of plants and phytocenoses.
The value of the plant range. Species ranges, formation and performance zones.
Life forms of plants (Raunkier, Serebryakov.)
Geographical elements of the flora of phytocenoses. Complexity of phytocenoses.
The impact of phytocenosis on the environment. The influence of phytocenoses on the soil, carbon dioxide in the air, other gases and terrain.
Classification and ordination of phytocenoses.
The influence of phytocenoses on light, wind, and the temperature regime of the environment. Important ecosystems and plants (steppe, desert, forest, meadow).
Direct human impact on vegetation. Mapping of vegetation cover.
Modern problems of geobotany.
Kazakhstan is currently undergoing a transformation of vegetation cover associated with the use of natural resources.

Discipline "Biogeocenology

" Introduction. Biogeocenology objects and tasks of its research.
Concepts of biogeocenology and ecosystems. Biogeocenology objects and tasks of its research.

Biocenosis its properties and features. The biogeocenosis is the smallest particle of the biosphere.
Biogeocenotic systems.
Concepts of parcels, biohorizonts. Properties of biocenoses: self-regulation and reproduction. The Le Chatelier principle.
Components of the basis of biogeocenoses.
Biogeocenosis and ecosystem: differences between these concepts. Uniformity of the inclined and vertical composition of biogeocenoses. The main trends in the evolution of the biosphere conclusions of its study.
Structure of phytocenosis.
Ecobiomorphs of plants. Biogeocenozdar. Horizontal structure of phytocenoses.
Academician V. N. Sukachev was the founder of the doctrine of biogeocenology.
Definitions of phytocenoses given by
Sukachev, Bykov, and Mirkin. Ecosemalar group. The main component of biogeocenosis is the function of phytocenosis and the tasks of their research work.
Plants, fungi, and lichens as components of the biogeocenosis.
Definition and general characteristics of " phytocenosis.
The main signs of phytocenosis. The atmosphere is a component of the biogeocenosis. The influence of the biosphere on life in the biogeosphere.
Boundaries of phytocenoses. The concept of the continuum of vegetation cover.
Relationships of biogeocenoses and their mechanisms.
The ratio of eaters and hatchers in the biogeocenosis (Whittaker, 1971). The leading role of the biocenosis or ecotope in the biogeocenosis. Stability and dynamics of biogeocenoses. Factors affecting the diversity and richness of the biocenosis. The main problems of biosphere and ecological research directions.

Discipline "Phytocenology "

The purpose of the discipline is Phytocenology and its place in the system of sciences.
The main stages of the development of the science of phytocenology, the formation and structure of phytocenoses. The concept of plant associations.
The first stage of the formation of the science of phytocenology.
The main stages of the development of the science of plant communities. The main scientific schools, traditions and directions. The first stage of creating the basis of the science of phytocenology and the formation of phytocenology. Development of phytocenology in the USA and England.
Formation of phytocenoses and the relationship of its components.
Phytocenological schools in Western Europe. Regularities of the formation of phytocenosis classification of plants in the phytocenosis, based on the result of exposure to each other. The study of the ecological and biological properties of plants, the study of the relationships between plants.
Floral composition, floral richness of the phytocenosis.
Floristic completeness, ecological composition of the phytocenosis. Ecological and biological composition of the cenotic flora, an indicator of its connection with the

environment. Systematic approaches to the analysis of phytocenosis. The difference in species by coenotic significance lies in the properties of the coenopopulations that make up the species.
Stages and vital states of individual plant development.
Methods for identifying and determining the ecological and biological groups of plants in the phytocenosis and determining their relationship with the environment.
Population (species) completeness of the phytocenosis.
Introduction to the main features of large-scale geobotanical research.
Quantitative ratio of coenopopulations, phytocenotic structure of coenopopulations. Activities for the organization of geobotanical field work.
Age composition of coenopopulations, types of phytocenoses.
Structure, ecology, ordination of phytocenoses. Determination of the presence of plant species in phytocenoses. The concept of plant associations. The tiering of phytocenoses and the horizontal structure of phytocenoses.
Ecological and biological structure of phytocenoses.
Problems of classification of plant groups. Ordination of plants. Evolution of the ordination technique gradient analysis. Polar viscontional ordination. Approaches to the study of the constitutional structure of phytocenoses.

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Main:

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