



«APPROVED»
Member of the Management Board,
Vice-Rector for Operations
NJSC «Al-Farabi KazNU»

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Тр № 9. УС.

The program of

the entrance exam for the group of educational programs of the Faculty of Biology and Biotechnology for master's degree for foreign citizens to study on a paid basis

1. General Provisions

1.1 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 Regulations for admission to studies in educational organization, implementing educational programs of technical and vocational education» (hereinafter – the Standard Rules).

1.2. Kazakh National University named after al-Farabi accepts individuals who have completed higher education programs for postgraduate education programs (master's degree).

1.3. Entrance exams are conducted in the form of interviews for the following educational programs:

- ✓ 7M05101 – Biology
- ✓ 7M05109 – Biotechnology
- ✓ 7M05116 – Microbiology
- ✓ 7M05117– Environmental bioengineering
- ✓ 7M05105 – Genetics
- ✓ 7M05112 – Geobotany
- ✓ 7M08402 – Aquaculture and aquatic biological resources
- ✓ 7M10112 – "Biomedicine" (one-year)
- ✓ 7M05102 – Biomedicine
- ✓ 7M05113 – Neuroscience

1.4. For the organization and conduct of entrance exams for the admission of foreign applicants, an examination subject commission for the academic year is established by the rector of al-Farabi Kazakh National University.

The examination commission for the admission exams of foreign applicants to KazNU includes employees of the Office of Internationalization and Recruitment (hereinafter referred to as the Office) and the teaching staff of KazNU.

1.5. If a foreign applicant who meets the above-mentioned requirements is unable to come to the University for the entrance interview, they have the option to take it in an online format.

1.6. Entrance exams in the form of oral interviews for the admission of foreign applicants are evaluated on a 100-point scale. For admission to the master's program on a fee-paying basis, a minimum of 75 points is required for the academic and pedagogical track (2 years) and a minimum of 50 points for the specialized track (1-1.5 years).

1.7. Following the entrance interview, a protocol is prepared in the established format. The interview protocol is signed electronically via the "Salem office" system by the chairperson and all attending members of the commission and then submitted to the Office.

1.8. The decision on admission is reviewed by the competition commission for the

enrollment of foreign applicants and documented by a protocol through the "Salem office" system. The results of the entrance exam are announced on the day of the exam.

1.9. Retaking the entrance exam is not allowed.

1.10. Appeals regarding the results of the interview are allowed within 24 hours.

2. Conducting the entrance exam in 2024:

2.1 The interview is conducted in Russian, Kazakh, and English languages. The oral interview also includes questions aimed at assessing the applicant's ability to learn, creative activity, critical thinking, and personal qualities.

2.2. An indicative list of interview topics:

1. The vascular system and its components.
2. The circulatory system. Arteries and veins. Patterns of their distribution throughout the body.
3. The nervous system. The brain. The main structures of the oblong, posterior and middle divisions, their functions. The intermediate brain, its parts and functions.
4. DNA replication. The basic principles of replication. Experimental evidence of the semi-conservative mechanism of DNA replication. The experience of Meselson and Stahl. Replication of ring DNA.
5. Proteins. The importance of proteins in the vital activity of organisms. The structure of proteins, their functions and properties. Amino acids. Classification, structure, properties, stereochemistry, amphotericity. The spatial structure of proteins. Classification. Simple and complex proteins, their characteristics. Isoelectric points.
6. Nucleic acids. Purine and pyrimidine bases. Nucleosides. Nucleotides. Polynucleotides. Deoxyribo- (DNA) and ribonucleic (RNA) acids. Chargaff rules. The structure and synthesis of DNA. RNA: informational (matrix), ribosomal, transport. Their biological functions, spatial structure. Protein biosynthesis. ATP and ADP systems, their role in metabolism.
7. General principles and methods of genetic engineering
8. Genetically modified organisms
9. Plant and animal breeding
10. Water exchange. Photosynthesis. The light phase of photosynthesis. Cyclic and non-cyclic electron transport.
11. Plant respiration. Ways of oxidation of the respiratory substrate. Glycolysis. The Krebs cycle.
12. Nutrient media and methods of their preparation
13. Primary and secondary metabolites of industrial importance
14. Selection and improvement of various organisms for biotechnological applications
15. Industrial methods for the production of microbial protein, enzymes
16. Vegetative organs of plants: root, leaf, stem, shoot
17. Current problems of geobotany
18. Ways to preserve biodiversity. The importance of species listed in the Red Book
19. Conservation measures for endangered species
20. Levels of organization of living organisms

2.3. Recommended reading list for preparation:

1. Daineko N.M., Zhadko S.V. Botany: Systematics of higher plants. Method. recommendations. – Chernihiv: Desna Polygraph, 2016. – 40 p.

2. Lotova L.I. Botany: Morphology and anatomy of higher plants. – M.: Librocom, 2010. – 512 p.
3. Nurtazin S.T. General histology. – Almaty: Kazakh University. – 2010. – 240 p.
4. Sinelnikov R.D., Sinelnikov A.Ya., Sinelnikov Ya.R. Atlas of anatomy. – T1. – 488 p., T2. – 536 p., T3 – 316 p.
5. Zhimulev S.G. General and molecular genetics. Novosibirsk: Siberian University Publishing House, 2007. – 480 p.
6. Bochkov N.P. Clinical genetics. Moscow: GEOTAR-Media, 2018. – 592 p.
7. Vasilenko V.N., Maksimov G.V., Stepanov V.I. Collection of problems in genetics. – M.: University book. - 2020. – 144 p.
8. Mushkambarov N.N., Kuznetsov S.L. Molecular biology. – M.: MIA LLC, 2007. – 535 p.
9. Konichev A.S., Sevastyanova G.A. Molecular biology. Ed. 4th ed., reprint. and additional – M.: Publishing center "Academy", 2012. – 400 p.
10. Watson J., Baker T.A., Bell S.P., Gunn A., Levin M., Losik R. Molecular biology of the gene (7th ed.), Cold Spring Harbor Laboratory Press, 2004-2013, 9122 pp.
11. Rees E., Sternberg M. Introduction to molecular biology: from cells to atoms: Translated from English – M.: Mir. 2002. – p.142.
12. Saparov K.A. Cytology and histology: oku kuraly. – Almaty: Kazakh University, 2019. – 311 b.
13. Turasheva S.K. Application of plant biotechnology: Monograph. Almaty: Qazaq University, 2020, 114 p.
14. Fundamentals of microbiology. The eleventh edition. - 2021. - Edited by Talaro K.P.
15. Hugo and Russell Pharmaceutical Microbiology, 9th Edition - 2023 – Edited by Brendan F.

3. Scale and criteria for evaluating the entrance exam for admission to the master's program (specialized track) for foreign citizens on a fee-paying basis:

Number of points	Compliance criteria
<p>90-100 points «Excellent»</p>	<p>All competencies required for the entrance exam have been mastered. A comprehensive answer has been provided to two theoretical questions:</p> <ul style="list-style-type: none"> - Scientific terminology has been correctly utilized. - All necessary features, elements, grounds, and classifications have been accurately named and defined to substantiate the arguments. - The main viewpoints accepted in scientific literature regarding the discussed issue have been indicated. - Own position or viewpoint has been argued, and the most significant research problems in this field have been identified. - The practical problem has been solved correctly with all necessary explanations.
<p>75-89 points «Good»</p>	<p>All competencies required for the entrance exam have been mastered. A correct answer has been provided to two theoretical questions, with minor deficiencies identified in preparation:</p> <p>Scientific terminology is applied.</p> <ul style="list-style-type: none"> - All necessary features, elements, classifications are named, but there is an