**JSC "Academy of Logistics and Transport"**

**Department of "Automation and Control"**

APPROVE

**Chairman of the ALT AC**

**S. Amirgalieva**

**Decision of the Academic Council of ALT**
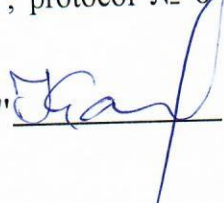
«_24_» _____ 2022 y. (protocol №_4_)

# BACHELOR'S DEGREE ENTRANCE EXAM PROGRAM FOR FOREIGN CITIZENS IN EDUCATIONAL PROGRAMS

**Group of educational programs:**

B059- Communications and Communication technologies
B062- Electrical engineering and Power engineering
B063- Electrical Engineering and Automation
B065- Motor vehicles
B095- Transport services
B165- Backbone networks and infrastructures
B166 – Transport facilities

**Almaty, 2022**

The program of the entrance exam was discussed and received a positive decision at the meeting of the Department of **"Automation and Control"**, protocol № 8 from «19» april 2022 y.

**Head of the Department of "Automation and Control"** _____ **K.M. Sansyzbai**


The program of the entrance exam was discussed and received at the meeting of the Council of the Institute "Automation and Telecommunications", Protocol No. 10 of June 23, 2022.

**Chairman of the Council of the Institute "Automation and Telecommunications"** _____ **A.Toigozhinova**

# CONTENT

1. **The purpose of the interview for a group of educational programs**

The purpose of the interview for groups of educational programs is to determine the theoretical and practical readiness of the applicant for bachelor's degree, the level of compliance of knowledge, skills and abilities with the requirements of bachelor's degree in the field of training.

This program lists the basic mathematical concepts corresponding to the high school mathematics course that an incoming student should possess, as well as a list of recommended literature for preparation.

During testing, you can use: a pen, a pencil, a simple calculator (as a separate object, not embedded in another object, for example, in a mobile phone or smartphone). The use of specialized literature and mobile phones / smartphones is not allowed.

2. **Interview questions for undergraduate admission to foreign applicants for undergraduate educational programs:**

6B11326 Organization of transportation, traffic and operation of transport
6B11328 Service management in the industry
6B11330 Transport Logistics
6B11333 Digital Logistics
6B11334 Transport ecologistics
6B11367 Organization of traffic
6B 07116 Railcars
6B 07117 Locomotives
6B07118 - Track and road vehicles
6B 07119 - Automation and automotive industry
6B07120 – Automation and control
6B07121-Electric power industry
6B07132 –Robotic systems in transport
6B07128 - Railway track and trackside
6B07129 - Bridges, tunnels and subways
6B07130–Highways and airfields
6B07131 – Pipeline facilities
6B06208-Telecommunication systems and railway communication networks
6B06209-Radio engineering, electronics and telecommunications

**BASIC CONCEPTS**

**Topic 1: Trigonometry.**

1. Radian measure of an angle. Definition of sine, cosine, tangent of an angle.

2. Basic trigonometric formulas. Trigonometric identities.

3. Solution of the simplest trigonometric equations.

4. Examples of solving the simplest trigonometric inequalities.

5. Inverse trigonometric functions. Their properties, graphs.

**Topic 2: Exponential and logarithmic functions.**

1. An exponential function, its properties and graph.

2. Exponential equations.

3. Exponential inequalities.

4. Systems of exponential equations and inequalities.
5. Logarithms. Properties of logarithms.
6. Decimal and natural logarithms. Number "e".
7. Logarithmic function, its properties and graph.
8. Logarithmic equations.
9. Logarithmic inequalities.
10. Basic logarithmic identity.

## Topic 3: Number sequences.
1. The concept of sequence. Numeric sequences.
2. Arithmetic progression, geometric progression.
3. The concept of the limit of a sequence. Limit of a function at a point.
4. Techniques for disclosing the simplest uncertainties, techniques for calculating limits.

## Topic 4: Derivative
1. Derivative. Derivative of a power function.
2. Rules of differentiation. Derivatives of some elementary functions.
3. Derivative of a complex function.  Differentiation technique.
4. Derivatives of trigonometric inverse trigonometric, logarithmic and exponential functions.
5. Research of functions and plotting.

## Topic 5: Integrals.
1. Antiderivative and indefinite integral
2. Table of basic integration formulas.
3. Direct integration, methods of change of variable.
4. Integration by parts.
5. Definite integral. Newton-Leibniz formula.
6. Basic properties of a definite integral.
7. Calculation of a definite integral. Improper integrals.

## Literature:
1. Textbook Algebra grade 10-11 A.N. Shynybekov. Almaty, "Atamura" 2014,
2. Guidelines: Algebra 10 guidelines A. N. Shynybekov. Almaty, "Atamura" 2014
3. Didactic materials: Algebra 10 didactic materials. A. N. Shynybekov. Almaty, "Atamura" 2014
4. Set of tasks: Algebra 10. Set of tasks. A. N. Shynybekov. Almaty, "Atamura" 2014