JSC «ALT University named after Mukhamedzhan Tynyshpaev»

APPROVED
Chairperson of the Board of Trustees of «ALT University»
_____ M.S. Zharmagambetova
Decision of the Academic Council of «ALT University»
from «30» 05 2025 year (protocol №10)

Interview Program for Applicants to the Specialized Master's Program

Educational Program
7M07168 - Automation and Digital Control

Almaty. 2025

The program of the entrance exam was discussed and received a positive decision at the meeting of the Department of Automation and Control, Protocol No. 8 on April 28, 2025.

Head of the department of "AC" G.A.Suleimenova

The program of the entrance exam was reviewed and recommended at the meeting of the Council of the Institute of Energy and Digital Technologies, Protocol No. 10 dated May 28, 2025.

Chairman of the Board of the Institute "EiCT" Togozhinova A.Zh.

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1. Purpose of the Interview

Admission to the master's program "7M07168 - Automation and Digital Control" at JSC "ALT University named after Mukhamedzhan Tynyshpaev" on a tuition basis is conducted based on the results of an interview. Candidates eligible to participate in the interview must have at least 5 years of experience in a managerial position related to the educational program in government or civil service, or at least 10 years of professional experience relevant to the educational program.

The interview is conducted to assess the applicant's level of theoretical and practical knowledge, professional competencies, and motivation for pursuing studies in the master's program.

2. Interview Procedure.

The interview for applicants to the master's program is conducted within 30 minutes. During this time, the applicant answers questions from the admissions committee approved by the President-Rector of the university.

At the applicant's choice, the interview may be conducted in Kazakh, Russian, or English. The interview is held either in-person or remotely, with mandatory use of video communication. The video recording is archived by the university for up to three years.

Candidates may be asked additional questions related both to the content of the interview and to other sections relevant to the program profile.

Applicants who do not attend the interview for valid reasons (illness or other documented circumstances) are allowed to take the interview on another day according to the approved schedule.

Interview protocols are submitted to the responsible secretary of the admissions committee immediately after the procedure is completed. All disputed issues related to the interview process are resolved in accordance with the legislation of the Republic of Kazakhstan.

3. Interview Evaluation Criteria

The interview is conducted based on an approved standardized protocol, which records the questions asked, the applicant's answers, and the final evaluation.

Candidates are assessed according to the University's internal system based on several criteria reflecting the applicant's level of preparation, professional experience, and motivation. The final decision of the committee is made collectively and documented in a protocol signed by all committee members.

No numerical passing score is established — the committee's decision determines whether the candidate meets the requirements for admission to the master's program.

Interview protocols of admitted applicants are kept in their personal files.

Table 1 – Interview Evaluation Criteria

Criteria	Descriptors	Scores
Motivation	Justification of reasons for applying to the program, choice of university, understanding of goals and prospects for professional and personal growth.	Sufficient / Insufficient
Research Competence	Proficiency in basic research skills necessary for scientific and analytical activities related to the educational program.	Sufficient / Insufficient
Creativity	Ability to propose unconventional solutions and demonstrate a creative approach to analyzing tasks and problems.	Sufficient / Insufficient
Communication Skills	Ability to clearly and logically express thoughts, justify one's point of view, and draw conclusions.	Sufficient / Insufficient
Committee Decision		Sufficient / Insufficient

4. Interview Questions

1. Purpose and Classification of Electric Centralization Systems
2. Types of Relay-Processor Centralization and Their Component Base
3. Microprocessor Centralization Systems: Features and Equipment
4. Purpose and Characteristics of Automatic Blocking Devices
5. Classification, Structure, and Control Principles of Protective Devices at Railway Crossings
6. Purpose and Design Principles of Train Direction Change Schemes
7. Dispatcher Centralization Systems: Purpose and Technical Operation Rules Requirements
8. Microprocessor Dispatcher Centralization Systems Used in Kazakhstan's Railway Network and Development Prospects
9. Purpose of Remote Control Signals, Remote Signaling, and Cycle Synchronization
10. Purpose and Features of Block-Hump Automatic Centralization
11. Features of Centralized Automatic Blocking Systems
12. Types of Typical and Dynamic Links
13. Frequency Characteristics of Dynamic Links
14. Time Characteristics of Dynamic Links
15. Concept of Automatic Control and Regulation

5. Recommended Literature

5.1 Main Literature

1. Glazunov L.P., Grabovetsky V.P., Fundamentals of Reliability Theory of Automatic Control Systems: Moscow, Marshrut, 2005 – 255 p.

2. Dudnikov E.G., Automatic Control in Industry / Textbook for Railway Transport Universities – 3rd ed., revised and expanded – Moscow: Transport, 2004 – 168 p.

3. Stefani E.P., Fundamentals of Building Automated Process Control Systems, Moscow: Energiya, 2006 – 352 p.

4. Tsirlin A.M., Optimal Control of Technological Processes, Moscow: Energoizdat, 2006 – 400 p.

5. Vasilkov Yu.V., Vasilkova N.N., Computer Technologies in Mathematical Modeling: Moscow: Finance and Statistics, 2002 – 265 p.

6. Olson G., Piani D., Digital Automation and Control Systems, St. Petersburg: Nevsky Dialect, 2001 – 557 p.

7. Kochetkov A.A., Remote Control Systems in Railway Transport, Moscow, Marshrut, 2005 – 304 p.

8. Satyrev F.E., Golik V.K., Dispatcher Centralization "Neman", Belarus, Gomel, 2003 – 106 p.

9. Dolgy I.D., Kulkin A.G., Dispatcher Control System and Train Traffic Management DC–South with RKP, Rostov-on-Don, RGUPS, 2010 – 468 p.

10. Vinogradova V.Yu., Voronin V.A., Kazakov E.A., Shvalov D.V., Shukhina E.E., Automatic Block Systems for Sections. Moscow, Marshrut, 2005 – 292 p.

11. Fedorov N.E., Modern Automatic Blocking Systems with Tonal Rail Circuits. Samara, SamGAPS, 2004 – 132 p.

12. Fedorov N.E., Relay and Microelectronic Systems for Interval Train Control. Samara, SamGAPS, 2006 – 163 p..

5.2. Additional Literature

1. Longbotov R.I., Reliability of Computing Systems: Moscow, Energiya, 2001 – 216 p.

2. Shultz V.A., Methodological Guidelines for Practical Classes. Almaty, KazATK, 2010 – 32 p.

3. Shultz V.A., Textbook "Dispatcher Centralization". Almaty, KazATK, 2010 – 86 p.

4. Technical Operation of Railway Automation and Telemechanics Devices and Systems: Textbook / Ed. by Dr. Tech. Sci. Vl.V. Sapozhnikov. Moscow: Marshrut, 2003 – 335 p.

5. Mankvein V.T., Frolov S.V., Shekhtman M.B., Application of SCADA Systems for Automation of Technological Processes. Moscow, Tambov: Mashinostroenie, 2000 – 176 p.

6. Aristova N.I., Korneva A.A., Industrial Software and Hardware Tools in the APCS Market, Moscow: Nauchtekhizdat, 2001 – 400 p.

7. Denisov A.A., Kolesnikov D.N., Theory of Large Control Systems, Leningrad: Energoizdat, 2000 – 228 p.

8. Vedernikov B.M., Automation and Telemechanics on Railway Sections. Textbook. KazATK, Almaty, 2009 – 109 p.

9. Vedernikov B.M., Automatic and Semi-Automatic Blocking. Textbook. KazATK, Almaty, 2009 – 132 p.

10. Vedernikov B.M., Track Sensors. Textbook. KazATK, Almaty, 2011 – 122 p.

11. Vedernikov B.M., Signal Auto-Regulation. Almaty, KazATK, 2009 – 92 p.

12. Vedernikov B.M., Automatic Protective Devices on Railway Sections. Almaty, KazATK, 2008 – 100 p.

13. Vedernikov B.M., Methodological Guidelines for Practical Classes on "Train Interval Control Systems" (for Master's students in specialty 6M070200 – Automation and Control). Almaty, KazATK, 2010 – 44 p.

14. Vedernikov B.M., Methodological Guidelines for Independent Work of Master's Students under Instructor Supervision on "Train Interval Control Systems". Almaty, KazATK, 2010 – 40 p.