

JSC «ALT University named after Mukhamedzhan Tynyshpaev»



APPROVE

Chairman of the ALT AC

S.Amirgalieva

Decision of the Academic Council of ALT

« 05 » 2024 (protocol № 9)


THE PROGRAM OF THE BACHELOR'S ENTRANCE EXAM FOR APPLICANTS TO RELATED EDUCATIONAL PROGRAMS ON THE BASIS OF TECHNICAL AND VOCATIONAL EDUCATION AND HIGHER EDUCATION FOR A SHORTENED TRAINING FORMAT


Group of educational programs:


- B057 – Information technologies
- B059 - Communications and communication technologies
- B062 - Electrical engineering and power engineering
- B063 - Electrical engineering and automation

Almaty 2024

The program of the bachelor's entrance exam for applicants to related educational programs based on the TVE and HE for a shortened training format was discussed and received a positive decision at the meetings of the Department of Automation and Control, Protocol No. 9 of May 28, 2024, Department of Information and Communication Technologies, Protocol No. 9 of May 17, 2024, Department of "Energy", Protocol No. 9 of May 17, 2024.

**Head of the Department
of "Automation and control"**  **K. Sansyzbay**

**Head of the Department
of "Information and
Communication Technologies"**  **D. Kasymova**

**Head of the Department
of "Energy"**  **A. Egzekova**

The program of the bachelor's entrance exam for applicants to related educational programs based on the TVE and HE for a shortened training format was reviewed and recommended at a meeting of the Council of the Institute "Automation and Telecommunications", Protocol No. 5a of May 29, 2024.

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

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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.

2. The content of the interview materials

Interview questions for applicants to related educational programs on the basis of TVE and HE for a shortened training format

According to educational programs 6B06118-"Software Engineering", 6B06116-"Information systems", 6B06126 – “Applied Artificial Intelligence”:

1. Client-server technology in web programming
2. HTML basics. HTML document Structure
3. Formatting of the text by means of HTML. DIV and SPAN tags
4. CSS basics. Formatting text using CSS styles
5. CSS properties for formatting objects
6. Positioning of objects
7. Lists. Hyperlinks
8. Insert graphics, videos. Image Maps
9. Tables in HTML
10. Forms, form elements. Methods of sending form data to the server
11. Introduction to neural networks
12. Perceptron networks
13. Linear neural networks.
14. Radial basis networks.
15. Recurrent neural networks
16. Main characteristics of a secure information system
17. Information protection
18. Information security
19. Information security measure
20. Computer system security

According to the educational program 6B06127 - "Mathematical and computer modeling":

1. Arithmetic calculations
2. The concept of a function
3. Sequence
4. Linear equations
5. Quadratic equations
6. The concept of a model. Modeling.
7. Types of modeling
8. Mathematical modeling
9. Simulation modeling
10. Computer modeling
11. Methods and tools for modeling processes and systems.
12. Software packages for computer modeling
13. Determinism and stochasticity, discreteness and continuity

14. Mathematical model. Simulation. Numerical experiment
15. General principles and purpose of mathematical modeling
16. Modeling in spreadsheets
17. Organization and modeling of stochastic systems
18. Mathematical apparatus of simulation modeling
19. Simulation modeling languages
20. Simulation (computer) modeling of production and technological systems

According to educational programs 6B06208-"Telecommunication systems and railway communication networks", 6B06209-"Radio engineering, electronics and telecommunications":

1. Periodic and non - periodic signals
2. Characteristics of random signals and interference
3. Principles of building a cellular radio communication system
4. Digital radio-relay communication lines
5. Fiber-optic communication lines
6. Cellular standards
7. Types of standards for telecommunication systems and networks
8. Types of messages and their characteristics
9. Types of signals and interference in telecommunication systems and their mathematical models
10. The concept of flow control in packet switching networks.
11. Indicators of the quality of information transmission channels
12. General structure of telecommunication networks
13. Basic topologies of telecommunication networks.
14. Classification of telecommunication networks by type of transmitted messages, by category of users, by message transmission speed.
15. Classification of telecommunication networks according to the degree of coverage, the method of switching, the type of communication channels used
16. Integration and convergence of digital telecommunications networks
17. Basic and additional communication services
18. Integrated Services Digital Networks (ISDN)
19. Synchronous (STM) transmission mode in digital networks
20. Asynchronous (ATM) transmission mode in digital networks

According to educational programs 6B07120-"Automation and control":

1. Contact system of electrical relays
2. Electrical relays. Classification and basic parameters
3. Electromagnetic neutral DC relays
4. Transients in electromagnetic relays

5. Types of polarized relays and their features
6. Types of combined relays and their features
7. Logical contactless elements in alarm, centralization and blocking devices
8. Basic concepts of telemechanics. Ways to manage remote objects
9. Telemechanical signals. Types of breeding
10. Classification and characterization of codes
11. Features of semiconductor materials
12. Semiconductor diodes. Classification and labeling
13. Operating modes of bipolar transistors
14. Operational amplifiers
15. Types of logical elements, principle of operation and truth tables
16. Transformers. Principle of operation and design
17. DC electric machines
18. Features of programmable logic controllers
19. Automatic regulators of automation systems
20. Electronic elements of automation systems

According to educational programs 6B07140—" Cybersecurity of digital system":

1. Structure and main elements of the automatic control system
2. Frequency criteria of system stability. Mikhailov and Nyquist stability criterion
3. Dynamic links and their characteristics
4. Semiconductor diodes. Classification and labeling
5. Operating modes of bipolar transistors
6. Types of logical elements, principle of operation and truth tables
7. DC electrical circuits. Basic concepts and definitions (current, voltage, power). Units of measurement.
8. Basic concepts and definitions of DC electrical circuits (branch, node, circuit).
9. The laws of direct current electrical circuits.
10. Principles of building operating systems, Classification of operating systems
11. Memory management in operating systems
12. File management and I/O in operating systems
13. Basic concepts and provisions of information protection in information and computing systems
14. Threats to information security in information and computing systems
15. The history of the main types of high-performance development of modern infrastructure solutions.
16. Cloud deployment models: private cloud, public cloud, hybrid cloud, public cloud.
17. Architecture and main functions of the DBMS.

18. Organization of the data storage environment and methods of data access.

19. Security in database management systems

20. Modern database management systems

According to educational programs 6B07121 - "Electric power industry", 6B07188 – "IT-power engineering":

1. DC electrical circuits. Basic concepts and definitions (current, voltage, power). Units of measurement.

2. Basic concepts and definitions of DC electrical circuits (branch, node, circuit).

3. The laws of DC electrical circuits.

4. Modes of operation of DC electrical circuits. Methods for calculating DC electrical circuits. Capacity balance.

5. Serial connection of two resistances. Diagram, derivation of the equivalent resistance formula.

6. Parallel connection of two resistances. Diagram, derivation of the equivalent resistance formula.

7. Single-phase alternating current electrical circuits. Getting, basic concepts and definitions.

8. Single-phase alternating current electrical circuits. Different views. Effective values of current and voltage

9. Resistance in a single-phase alternating current circuit. Time and vector diagrams.

10. Inductance in a single-phase alternating current circuit. Time and vector diagrams.

11. Inductance in a single-phase alternating current circuit, the output of the formula for determining the inductive resistance.

12. Capacity in a single-phase alternating current circuit. Time and vector diagrams.

13. Capacitance in a single-phase alternating current circuit, output of the capacitance resistance formula.

14. Serial connection of a resistor and a capacitor. The total complex resistance of the circuit.

15. Serial connection of resistor and inductance. The total complex resistance of the circuit.

16. Three-phase electric circuits. Connection of receivers according to the "star" scheme. Scheme. Symmetrical mode. Linear and phase currents and voltages, the relationship between them.

14. Three-phase electric circuits. Connection of receivers according to the "star" scheme. Scheme. Symmetrical mode. Linear and phase currents and voltages, the relationship between them.

15. Three-phase electric circuits. Connection of receivers according to the "star" scheme. Symmetrical mode. Vector diagram. Linear and phase currents and voltages, the relationship between them.

16. Three-phase electric circuits. Connection of receivers according to the "star" scheme. Asymmetric mode.

17. Three-phase electric circuits. Connection of receivers according to the "star" scheme. Asymmetric mode.

18. Three-phase electric circuits. Connection of receivers according to the "triangle" scheme. Symmetrical mode. Linear and phase currents and voltages, the relationship between them.

19. Three-phase electric circuits. Connection of receivers according to the "triangle" scheme. Symmetrical mode. Vector diagram. Linear and phase currents and voltages, the relationship between them.

20. Three-phase electric circuits. Connection of receivers according to the "triangle" scheme. Asymmetric mode.

3. Recommended literature

3.1 Basic literature

1. Сапожников В.В и др. Надежность систем железнодорожной автоматики и телемеханики. Учебное пособие. Москва, 2017. – 318 с.
2. Сапожников В.В., Сапожников Вл.В., Ефанов Д.В. Теория дискретных устройств железнодорожной автоматики, телемеханики и связи. Учебник. – М.: Учебно-методический центр по образованию на железнодорожном транспорте, 2016. – 339 с.
3. Черезов Г.А. Теоретические основы автоматики и телемеханики. Лабораторный практикум. – Екатеринбург: УрГУПС, 2016. – 98 с.
4. Бейнарович В.А. Основы автоматики и системы автоматического управления: Учебник для вузов. 3-е изд., перераб. и доп. – Томск: В-Спектр, 2012. – 352 с.
5. Сафиуллин Р.К. Основы автоматики и автоматизация процессов. Казань: Изд-во Казанск. гос. архитект.-строит. ун-та, 2013 – 187 с.
6. Талшықты-оптикалық байланыс жолдары. Оқу құралы. Кусамбаева Н.Ш., -Алматы, ҚазККА, 2018ж., -106 б.
7. Талшықты-оптикалық байланыс жолдары. Оқу құралы (зертханалық практикум). Кусамбаева Н.Ш., -Алматы, ҚазККА, 2015ж.
8. Талшықты-оптикалық тарату жүйесі. Оқу құралы. Г. Бойко, А. Кшалова, В. Эйрих; ҚР Білім және ғылым министрлігі техникалық және кәсіптік білім беру ұйымдарына ұсынады. 3 бас.толық., өңдел.- Астана: Фолиант, 2016.- 144б.- (Кәсіптік білім).
9. Волоконно-оптические линии связи. Учебное пособие (лабораторный практикум). М.А. Липская.-Алматы: КазАТК, 2012.- 112с.
10. Волоконно-оптические линии связи. Лабораторный практикум. Липская М.А., Алматы, КазАТК, 2012г. -120 б.
11. Устройства СВЧ и антенные системы: Антенные системы локации, навигации и радиосвязи. Под.ред. А.Ю. Гринева. М.: Радиотехника, (Научно-технические серии). 2013г.176 стр.
12. Устройства СВЧ и антенные системы: Моделирование, проектирование и технологии. СВЧ, устройств и ФАР. Под. ред. А.Ю. Гринева. М.: Радиотехника. 2014г. 198 стр.
13. Устройства СВЧ и антенные системы: Активные и цифровые антенные решетки, и их элементы. Под.ред. А.Ю. Гринева. М.: Радиотехника. 2014 г. 172 стр.
14. Радиоприемные устройства: учебное пособие. А.М. Достярова. Алматы: КазАТК. 2015г. 192 стр.
15. Кусамбаева Н.Ш. Желілі-кабельді құрылыстар. Оқу құралы. Алматы: КазККА, 2017ж.- 120 б.

16. Шеннон К. Теория связи в секретных системах/Сб.: «Работы по теории информации в кибернетике». – М.: Иностранная литература, 1963. – С.333-402
17. Диффи У., Хеллман Н.Э. Защищённость и помехостойкость. Введение в криптографию.//ТИИЭР, 1979.-Т.667.-N3.-С.71-109.
18. Симионс Г.Дж. Обзор методов аутентификации информации//ТИИЭР, 1988.-Т.76.-n5.-С.105-125.
19. Борсуков В. Бизнес и безопасность связи//Монитор Аспект, 1993.- N1.- С.56-62.
20. Герасименко В.А. Защита информации в автоматизированных системах. Ч. 1,2. М.: «Высшая школа», 1995.

3.2 Additional literature

1. Шульц В.А., Абдикешова Ж.Д. Основы автоматики и дискретных устройств. Учебное пособие. Алматы: КазАТК, 2011. – 153 с.
2. Исембергенов Н.Т. Элементы и устройства автоматики. Учебник. Алматы: Бастау, 2009. – 248 с.
3. Переборов А.С., Брылеев А.М., Смирнова А.В., Эйлер А.А., Сапожников В.В. Теоретические основы железнодорожной автоматики и телемеханики. М.: Транспорт, 1984. – 384 с.
4. Гордеев А.С. Основы автоматики: Учебное пособие для вузов / А.С. Гордеев. – Мичуринск.: МичГАУ, 2006 – 220 с.
5. Оптические кабели связи. Э.Л. Портнов, М.: Горячая линия – Телеком, 2012г.
6. Рекомендация (стандарт МСЭ-Т) ИТУ-Т G.651.1. Источник: http://svarka-optiki.ru/down/view/normativnyye_dokumenty_po_vols.html
7. Рекомендация (стандарт МСЭ-Т) ИТУ-Т G.652. Источник: http://svarka-optiki.ru/down/view/normativnyye_dokumenty_po_vols.html
8. Рекомендация (стандарт МСЭ-Т) ИТУ-Т G.653. Источник: http://svarka-optiki.ru/down/view/normativnyye_dokumenty_po_vols.html
9. Законодательные акты РК в области защиты и безопасности информации.
10. Нормативные документы РК в области защиты и безопасности информации.
11. Грушо А.А., Тимонина Е.Е. Теоретические основы защиты информации.-М.: «Яхстмен»,1996.-71 с.
12. Хореев А.А. Способы и средства защиты информации. Учебное пособие.-М.: МО РФ, 2000.- 316 с.
13. Уолкер Б. Дж., Блек Я.Ф. Безопасность ЭВМ и организация их защиты: Пер. с англ.-М.: Связь. 1980.-112 с.