JSC «ALT University named after Mukhamedzhan Tynyshpayev»
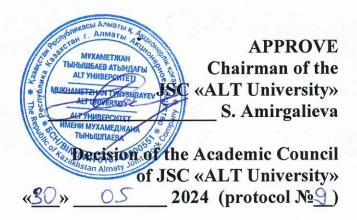
BACHELOR'S DEGREE ENTRANCE EXAM PROGRAM FOR FOREIGN CITIZENS IN EDUCATIONAL PROGRAMS

Group of educational programs:
B044-Management and management
B047-Marketing and advertising
B057-Information technology
B059-Communications and Communication technologies
B060-Chemical engineering and processes
B062-Electrical engineering and Power engineering
B063-Electrical Engineering and Automation
B064-Mechanics and metalworking
B065-Motor vehicles
B073-Architecture
B074-Urban planning, construction works and civil engineering
B075-Cadastre and land management
B094-Sanitary and preventive measures
B095-Transport services
B165-Backbone networks and infrastructures
B166-Transport facilities

Almaty, 2024

The program of the Bachelor's entrance exam for foreign citizens was discussed and received a positive decision at the meeting of the Department of General Engineering, Protocol No. 9 of May 16, 2024, Department of Language Training, Protocol No. 9 of May 25, 2024, Department of Logistics and Transport Management, No. 9 from "15" May 2024.

Head of the Department of
«General Engineering» _____ **P.T. Akhmetova**

Head of the Department of
«Language training» _____ **G.U.Kunakova**

Head of the Department of
«Transport Logistics
and Management» _____ **G.Zh.Kenzhebaeva**

The program of the bachelor's entrance exam for foreign citizens was reviewed and recommended at the meeting of the COC of the Educational and Methodological Bureau of the Institute "Basic and Distance Education", No. 5 dated April 18, 2024.

Chairman of the COC-EMBI
«Basic and distance education» _____ **A.S.Abdiraimova**

CONTENT

1. The purpose of the interview for a group of educational programs (physics, mathematics)

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 physical concepts corresponding to the courses of physics and mathematics of secondary school, which the applicant must 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 admission to the Bachelor's degree for foreign applicants in all educational programs:

Physics:
Topic 1. Kinematics
1. Mechanical movement. The frame of reference. The relativity of motion. The radius is a vector. Trajectory. Way. Moving.
2. Acceleration. Equidistant motion. The dependence of kinematic quantities among themselves in equidistant motion. Vector and coordinate formulas.
3. Curvilinear motion. Instantaneous acceleration as the sum of tangential and normal. The radius of curvature of the trajectory. Expression of the day of instantaneous normal acceleration.
4. Movement with connections. Kinematic connections: thread, rod, no slippage, sliding without separation.
Topic 2. Dynamics
1. The basic laws of the dynamics of a material point. The main task of dynamics. Interaction
2. Impulse. Center of mass. The momentum of a point and a system of points. The law of changing the momentum of a material point. An impulse of power.
3. Mechanical work. Energy. Kinetic energy of a material point. The kinetic energy theorem. Potential and conservative systems.
4. Collisions. Absolutely elastic and absolutely inelastic collisions. What does the mechanical energy of colliding bodies go into if it is not conserved?
5. The law of Universal gravitation. The law of gravitational interaction of point masses and balls. The field of gravity. The Gauss theorem. Potential energy in the Coulomb field. Kepler's laws. Cosmic speeds. Satellites.
6. Static. Conditions of equilibrium of a body under the action of a plane system of forces.

Topic 3. Thermodynamics and molecular physics

1. Statistical and dynamic methods of describing systems. Micro and macro parameters. Equilibrium and nonequilibrium states.

2. Empirical gas laws. The laws of Charles, Gay-Lussac, Boyle—Marriott, Dalton, Avogadro, their approximate nature and scope of applicability. Absolute temperature.

3. Molecular kinetic theory. The main provisions of the MKT and their experimental justification. The mass and size of the molecules. The average distance between the molecules.

4. The first beginning of thermodynamics. Thermodynamics and MKT. The first principle of thermodynamics is the general law of conservation of energy. Internal energy.

5. The second beginning of thermodynamics. Irreversibility. Nonequivalence of mechanical and internal energies. The probabilistic nature of irreversibility. Examples of irreversible processes.

6. Phase transitions. Crystalline and amorphous bodies. Types of phase transitions. Dynamic phase equilibrium. Saturated steam.

7. Hydrostatics. Deformations of the liquid. Newtonian and non-Newtonian fluids. Conditions of fluid equilibrium. Pascal's law.

8. Surface tension. The surface layer. Surface energy. Surface tension coefficient (two definitions and their equivalence).

9. Elasticity. Hooke's law. The dependence of stiffness on size. Young's module. Poisson's ratio.

Topic 4. Electrostatics

1. The basic laws of electrostatics. Fundamental interactions. Two kinds of electric charges. The law of conservation of charge. The principle of superposition. Coulomb's law. Systems of units.

2. Electric field. Long-range and short-range. Tension. Trial charge.

3. Gauss' theorem. Solid angle. Flow. Proof of the Gauss theorem. The relationship of the flow with the force acting on a uniformly charged plane. Symmetry considerations. The impossibility of stable equilibrium of a system of point charges.

4. Potential. Conservativeness of the point charge field. Conservativeness of an arbitrary electrostatic field. Potential.

5. Guides. Properties of conductors in an electrostatic field. The uniqueness theorem. Screening. Earth.

6. Pressure and energy of the field. The energy density of the electric field, as a general formula for arbitrary fields. Field pressure.

7. Dipole. The dipole field. The dipole moment. The energy of the dipole in the external field.

8. Capacity. Capacitors. The capacity of the solitary conductor. The energy of the field of a solitary conductor, a capacitor. The capacitance of the capacitor. Features of the "flat capacitor".

9. Dielectrics. Polar and nonpolar dielectrics. Polarizability.

Topic 5. Direct current

1. The section of the chain. Conditions necessary for the existence of an electric current. The viscous friction model. Ohm's law in integral and differential form.

2. Closed circuit. Outside forces, their necessity. Voltage, potential difference and EMF. Voltage drop. The Kirchhoff rules.

3. Current in media. The passage of current through electrolytes. Laws of electrolysis. Current in vacuum. Electronic lamps.

Topic 6. Magnetic field

1. Magnetostatics, magnets. Interaction of moving charges. Magnetic field. Magnetic field induction. The Lorentz force is a fundamental force in nature. Ampere power. The left-hand rule.

2. Electromagnetic induction. The phenomenon of electromagnetic induction. Faraday's experiments. The law of electromagnetic induction. Electromagnetic rail generator and motor. Demonstration of external forces, voltage and potential difference at the source.

Topic 7. Mechanical and electrical vibrations

1. Mechanical vibrations. The equation of small free oscillations near the position of stable equilibrium, its solution is harmonic oscillations. Amplitude, phase, period, frequency. Initial conditions.

2. Electrical vibrations. Oscillatory circuit. Free oscillations in the circuit. Transformation of energy in the circuit.

3. Forced fluctuations. Alternator. Active, capacitive, inductive resistances. Ohm's law for an alternating current circuit.

Topic 8. Mechanical waves

1. Mechanical waves. The beginning of acoustics. Transverse and longitudinal waves — the elasticity of the medium for shear and compression. Kinematics of the wave.

2. Electromagnetic waves. Introduction of the displacement current into the law of magnetic field circulation. The complete system of Maxwell's equations. Electromagnetic waves are the solution of Maxwell's equations.

Topic 9. Optics

1. Physical optics. Wave propagation. The Huygens principle. Derivation of the laws of refraction and reflection of waves from the Huygens principle. Interference of waves. Maximum and minimum conditions.

2. Geometric optics. Photometry. Geometric optics is the limiting case of wave optics. Preservation of phase relations by the lens. Beam.

Topic 10. Atoms and quanta. Core physics. Elementary particles

1. Photo effect and its regularities. Einstein's photon. The equation of the photoelectric effect. The Compton effect. Phenomena confirming the complexity of the atom.

2. The composition of the core. Isotopes. Nuclear forces. Nuclear reactions. The binding energy of the nuclei. Radioactivity.

Mathematics:
Topic 1. Trigonometry
1. The radial measure of the angle. Determination of the sine, cosine, tangent of the 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. 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. The number "e".
7. Logarithmic function, its properties and graph.
8. Logarithmic equations.
9. Logarithmic inequalities.
10. The basic logarithmic identity.
Topic 3. Numerical sequences.
1. The concept of sequence. Numerical sequences.
2. Arithmetic progression, geometric progression.
3. Techniques for revealing the simplest uncertainties, the technique of calculating limits.
Topic 4. Derivative.
1. Derivative. The derivative of a power function.
2. Rules of differentiation. Derivatives of some elementary functions.
3. The derivative of a complex function. Differentiation technique.
4. Derivatives of trigonometric and inverse trigonometric, logarithmic and exponential functions.
5. Function research and plotting.
Topic 5. Integrals.
1. The primitive and indefinite integral
2. Table of basic integration formulas.
3. Direct integration, variable replacement method.
4. A definite integral. The Newton–Leibniz formula.
5. Basic properties of a certain integral.
6. Calculation of a certain integral. The area of flat shapes.

3. The purpose of the interview for a group of educational programs (geography)

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.

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.

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

6B11330 – Transport logistics
6B11328 - Service management in the industry
6B11333 - Digital logistics
6B11340 - Customs logistics
6B11326 – Organization of transportation, traffic and operation of transport
6B11367– Traffic management

1. The main stages of geography development
2. The origins of geographical knowledge. Geography of ancient times, the Middle Ages and the era of Great Geographical Discoveries
3. Modern geography: formation and main directions of development
Methods of geographical research
4. Classification of geographical research methods
5. New methods of geographical research
6. Geographical map – a model of the Earth's surface.
7. The physical world of the Earth
8. History of the Earth's development
9. Geological history of the Earth. The system of geological chronology.
10. The influence of the Sun and Moon on Terrestrial processes
The influence of the Sun and Moon on terrestrial processes
Geographical shell as a natural complex of planetary scale
11. Zoning is the main pattern of the geographical shell
12. Characteristics of the components of the geographical shell. Lithosphere. Atmosphere. Hydrosphere.
13. Soils, flora and fauna of the Earth
14. Interaction of society and nature at different stages of human development

15. Natural resources. Resource availability and forecasting of the state of natural resources

16. Distribution of natural resources on land and in the World Ocean.

17. Territorial and spatial division of the geographical envelope

18. Natural components and natural-territorial complexes (PTC).

19. Territorial organization of the society. Geography of the world economy. The concept of the territorial organization of the life of the population. Territorial socio-economic systems. Factors and principles of district planning.

20. World economy. World economy and scientific and technological progress. International division of labor

21. The world economy and its sectoral structure. International economic integration.

22. The impact of scientific and technological progress on the world economy

23. Geography of branches of the world economy.

24. Factors of placement of branches of the world economy.

25. Industry of the world.

26. Energy.

27. Metallurgy

28. Mechanical engineering.

29. Chemical industry

30. Forestry industry

31. Light industry. Food industry.

32. Transport

33. World agriculture. Crop production. Agricultural industry. Animal husbandry

34. Global problems of mankind and the role of geography in their solution.

35. The essence of the concept of "global problems of mankind". Geoecological problems

36. Demographic problem. Demographic policy.

37. Political geography. Geopolitics.

38. International cooperation in solving environmental problems Concept of sustainable development.

5. The purpose of the interview for a group of educational programs (English language)

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 concepts of conjugation of the verb "to be" and the types of questions with the verb "to be" in the present tense (General, Special, Alternative, Disjunctive); Pronouns, nouns - singular and plural; article; possessive

case of nouns; verb "Have / have got" in Present Simple Tense; question types; English language time categories; prepositions of place and time; "there is/there are"; pronouns – some, any, no, corresponding to the foreign language course of secondary school, which the applicant must 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.

6. **Interview questions for admission to the Bachelor's degree for foreign applicants in all educational programs:**

Free time
What do you like doing in your free time?
How much free time do you have each week?
Is there another sport or hobby you would like to try?

Family
Do you have a big family?
What activities do you like doing with your family?
Are you similar or different to other members of your family?

Where you live
Where do you live?
Can you describe the area where you live?
Is it a good place to live? Why or why not?

School
What subjects do you like the most?
Are there any subjects you don't like?
Which subjects do you think are the most useful in life?

Future
Are you hoping to go to university? What would you like to study?
What job would you like to do?
Would you like to go and live in a different city or country? Why or why not?

Your best friend
Tell me about your best friend.
What activities do you do together?
Are you similar or different to your best friend?

Internet
Do you like using computers? Why or why not?
How much time do you spend on the internet each week?
Tell me about a website you often go to.

Films
How often do you watch films?
What kind of films do you like? Do you have a favourite film?
Do you prefer watching films or reading books? Why?

7. Recommended literature

3.1 BASIC LITERATURE

1. Мякишев, Б.Б. Буховцев, Н. Н. Соцкий. Физика. 11 класс. Учебник. - М.: Просвещение, 2011

2. Г.Я. Мякишев, Б.Б. Буховцев, В.М. Чаругин. Физика. 10 класс. Учебник. - М.: Просвещение, 2011

3. Мякишев Г.Я., Синяков А.З. Физика: Молекулярная физика. Термодинамика. 10 кл.: Учебник для угл.изучения физики – М.; Дрофа, 2005

4. Мякишев Г.Я., Синяков А.З., Слободсков Б.А. Физика: Электродинамика 10-11 кл.: Учебник для угл.изучения физики: 3-е изд. – М.; Дрофа, 2015

5. Мякишев Г.Я., Синяков А.З. Механика. 10 кл.: Учебник для угл.изучения физики: 3-е изд. – М.; Дрофа, 2005

6. Мякишев Г.Я., Синяков А.З. Колебания и волны. 11 кл.: Учебник для угл.изучения физики: 2-е изд. – М.; Дрофа, 2015

7. Мякишев Г.Я., Синяков А.З. Оптика. Квантовая физика. 11 кл.: Учебник для угл.изучения физики. – М.; Дрофа, 2014

8. Рымкевич А.П. Сборник задач по физике 10 11 классы: 13-е изд. - М.; Дрофа, 2014

9. Учебник Алгебра 10-11 класс А.Н. Шыныбеков. Алматы, "Атамура" 2014.

10. Методические указания: Алгебра 10 методические указания А. Н. Шыныбеков. Алматы, "Атамура" 2014г.

11.Анохин, А. А. География населения с основами демографии: учебник для академического бакалавриата / А. А. Анохин, Д. В. Житин. — Москва : Издательство Юрайт, 20ХХ. — 279 с.

12. Барсов, Н. П. Очерки русской исторической географии. География начальной летописи / Н. П. Барсов. — Москва: Издательство Юрайт, 20ХХ. — 218 с.

13. Вишняков Я. Д. Экономическая география: учебник и практикум для среднего профессионального образования / Я. Д. Вишняков [и др.]; под общей редакцией Я. Д. Вишнякова. — Москва: Издательство Юрайт, 20ХХ. — 594 с.

14. Геттнер, А. География. Ее история сущность и методы / А. Геттнер; переводчик Е. А. Торнеус. — Москва: Издательство Юрайт, 20ХХ. — 490 с.

15. Григорьев, А. А. Удивительная география: учебное пособие / А. А. Григорьев. — 2-е изд., испр. и доп. — Москва: Издательство Юрайт, 20ХХ. — 364 с.

16. Григорьев, А. А. География всемирного наследия: учебное пособие для академического бакалавриата / А. А. Григорьев. — 2-е изд., испр. и доп. — Москва : Издательство Юрайт, 20ХХ. — 298 с.

17. Герасимова, М. И. География почв: учебник и практикум для среднего профессионального образования / М. И. Герасимова. — 3-е изд., испр. и доп. — Москва : Издательство Юрайт, 20ХХ. — 315 с.

18. "Essential grammar in use" by Raymond Murphy, Third edition, Cambridge University Press 2007.

19. "New English File" by Clive Oxenden, Christina Latham-Koening, Paul Selegson for Elementary, Oxford University Press 1997.

3.2 ADDITIONAL LITERATURE

1. Н.И. Гольдфарб. Физика. Задачник. 9 – 11 классы. – М.: Дрофа, 2015

2. Н.А. Парфентьева, М.В. Фомина. Правильные решения задач по физике. - М.: Мир, 2006

3. С.И Кашина, Ю.И. Сезонов. Сборник задач по физике. – М.: Высшая школа, 1996

4. О.И. Громцева Физика. Полный курс А.В.С. Самостоятельная подготовка к ЕГЭ. - М.: Экзамен, 2013

5. Тарасов, А.Н.Тарасова. Готовимся к экзамену по физике. - М.: ОНИКС, Мир и Образование, 2007

6. Белолипецкий С.Н., Еркович О.С., Казаковцева В.А., Цвецинская Т.С. Задачник по физике. – М.: ФИЗМАТЛИТ, 2005.1. Электрическая станция как основной генерирующий элемент энергосистемы. Виды электрических станций.

7. Дидактические материалы: Алгебра 10 дидактические материалы. А. Н. Шыныбеков. Алматы, "Атамура" 2014г.

8. Набор задач: Алгебра 10. Набор задач. А. Н. Шыныбеков. Алматы, «Атамура» 2014 г.

9. Герасимова, М. И. География почв: учебник и практикум для академического бакалавриата / М. И. Герасимова. — 3-е изд., испр. и доп. — Москва: Издательство Юрайт, 20ХХ. — 331 с.

10. Иванова, Т. Г. География почв с основами почвоведения: учебное пособие для среднего профессионального образования / Т. Г. Иванова, И. С. Синицын. — Москва: Издательство Юрайт, 20ХХ. — 250 с.

11. Калуцков, В. Н. География России: учебник и практикум для среднего профессионального образования / В. Н. Калуцков. — 2-е изд., испр. и доп. — Москва: Издательство Юрайт, 20ХХ. — 347 с.

12. Каледин Н. В. География мира в 3 т. Том 1. Политическая география и геополитика: учебник и практикум для бакалавриата и магистратуры / Н. В. Каледин [и др.]; под редакцией Н. В. Каледина, Н. М. Михеевой. — Москва: Издательство Юрайт, 20ХХ. — 295 с.

13. Лобжанидзе, А. А. География народов и религий: учебник и практикум для среднего профессионального образования / А. А. Лобжанидзе, С. А. Горохов, Д. В. Заяц. — 2-е изд., перераб. и доп. — Москва : Издательство Юрайт, 20ХХ. — 211 с.

14. Путырский, В. Е. Политическая география: учебник для академического бакалавриата / В. Е. Путырский. — Москва: Издательство Юрайт, 20ХХ. — 414 с.

15. Солодовников, А. Ю. Социально-экономическая география евроатлантического региона: учебник и практикум для академического бакалавриата / А. Ю. Солодовников. — 2-е изд., перераб. и доп. — Москва : Издательство Юрайт, 20ХХ. — 370 с.

16. Textbook "English" All sections of the school course with keys. N.V. Solntseva, O.A. Chelysheva 2021 – 320p.

17. Collection of 500 exercises in English: summer tasks for consolidation and preparation. N.V. Selyantseva, 2022 – 128p.