APPROVED
at a meeting of the Academic Council of NJSC «KazNU named after al-Farabi»
Protocol № 11 from 23. 05. 2025 y.

The program of the entrance exam for applicants to the PhD for the group of educational programs D011 – "Training of physics teachers"

I. General provisions

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 Rules for Admission to Education in Educational Organizations Implementing Educational Programs of Higher and Postgraduate Education» (hereinafter referred to as the Model Rules).

2. The entrance exam for doctoral studies consists of writing an essay, an exam in the profile of a group of educational programs and an interview.

Блок	Баллы
1. Interview	30
2. Essay	20
3. Exam according to the profile of the group of the educational program	50
Total admission score	100/75

3.The duration of the entrance exam is 3 hours 10 minutes, during which the applicant writes an essay and answers the electronic examination ticket. The interview is conducted at the university premises before the entrance exam.

II. Procedure for the entrance examination

1. Applicants for doctoral studies in the group of educational programs D011 – - «Training of Physics Teachers» write a problematic / thematic essay. The volume of the essay is at least 250words.

The purpose of the essay is to determine the level of analytical and creative abilities, expressed in the ability to build one’s own argumentation based on theoretical knowledge, social and personal experience.

Types of essays:

- motivational essay revealing the motivation for research activities;
- scientific-analytical essay justifying the relevance and methodology of the planned research;

- problem/thematic essay reflecting various aspects of scientific knowledge in the subject area.

2. The electronic examination card consists of 3 questions

Topics for exam preparation according to the profile of the group of the educational program:

1. Pedagogical science and its place in the system of human sciences. The main categories of higher school pedagogy. The main directions and trends in the development of higher education in the modern world.

2. The regulatory and legal framework of the education and higher education system of the Republic of Kazakhstan. The credit system of education. The Bologna process.

3. Methodology of higher school pedagogy. Levels of methodology of pedagogy. Methods of pedagogical research.

4. Pedagogical activity and the structure of pedagogical activity. The personality of a high school teacher and modern requirements for his competence.

5. Professional and pedagogical culture: Pedagogical skills of a university teacher. a high school teacher.

6. The content and structure of pedagogical communication. Styles and levels of pedagogical communication.

7. The holistic pedagogical process of higher education. Patterns and principles of the pedagogical process of higher education. Stages of the pedagogical process of higher education.

8. The concept of didactics and the learning process. Patterns and principles of learning. The components of the learning process in higher education.

9. The content of higher professional education. The structure and levels of education content.

10. Classification of teaching methods.

11. The subject of psychology, its tasks and methods. Methodological foundations of human studies. The science of man. Basic methods of psychological research.

12. The concept of the psyche and its evolution. The origin and development of human consciousness. The concept of consciousness. The development of the human psyche. The physiological foundations of the human psyche.

13. The general concept of sensations. Types of sensations. The main properties and characteristics of sensations. Sensory adaptation and interaction of sensations. Characteristics of the main types of sensations.

14. General characteristics of perception. The physiological basis of perception. Basic properties and types of perception.

15. Definition and general characteristics of memory. The main types of memory. Basic processes and mechanisms of memory. Individual characteristics of memory and its development.

16. The nature and basic types of thinking. Basic forms of thinking. Theoretical and experimental approaches to the study of thinking. The main types of mental operations. Solving complex mental problems and creative thinking. Development of thinking.

17. The general concept of personality. The relationship between the social and the biological in personality. Personality formation and development.

18. General characteristics of human abilities. Levels of development of abilities and individual differences. The development of abilities.

19. Temperament and character. The concept of temperament. A brief overview of the teachings on temperament. The concept of character. Theoretical and experimental approaches to character research. Character formation.

20. The subject and research methods of teaching physics. The relationship of physics teaching methods with other sciences. General questions of the methodology of teaching physics.

21. Particular issues of the methodology of teaching physics. Teaching methods for solving physical problems.

22. The concept of "physical task". Structure. Classification. The role and place of tasks in teaching physics. The methodology of the solution and the methodology of teaching the solution of the UFZ.

23. The essence and structure of the UFZ solution process. Stages of the process of solving physical problems.

24. Types of tasks. The role of logical tasks in teaching physics. Familiarisation with the content of the logical task.

25. Types and features of solving graphical problems.

26. Experimental tasks. Formulation and solution of experimental problems.

27. Features of teaching methods for solving physical problems in mechanics at the university.

28. Features of teaching methods for solving physical problems in molecular physics at the university.

29. Teaching methods for solving problems in electrostatics at the university.

30. Methods of teaching solving physical problems in the section "Direct and alternating currents" at the university.

31. Teaching methods for solving physical problems in the section "Magnetic field. Electromagnetic induction. Electromagnetic vibrations and waves" at the university.

32. Goals and objectives of the discipline "Methods of teaching physics". Objectives of the teaching methodology. The role of physics in the educational process. SMART goals.

33. Types of physics lessons. Planning of physics classes, calendar plan, lesson plan. A lesson plan for new physics material. Requirements for a modern physics lesson.

34. The subject of "Physics" as an academic discipline, its structure, content. Current trends in improving the content of the physics course. Types of educational experiment in physics. Requirements for the physics classroom.

35. Scientific logical methods used in teaching physics, the synergetic basis of pedagogical management.

36. Didactic principles of teaching physics. Basic professional and methodological knowledge, skills and abilities of a physics teacher.

37. Methods of teaching physics. Reference signs in physics, structural and logical systems.

38. Methods of knowledge and control of knowledge, knowledge and skills in physics. Basic principles of testing. Content of reports and rating points.

39. The ability of management to conduct training at the resolution of physical tasks. The purpose and objectives of the training of technical means in the process of physics training.

40. Physical tasks as part of training and education. Classification of tasks in physics. Using the method of problem education in the uroks of physics.

41. The possibility of conducting excursions, special work on physics. Organization and maintenance of physical and physical-technical mugs.

42. Organization of optional activities for physics and their attention. The possibility of forming the scientific world and socialization of students in the process of training in physics. Active methods of training are used for studying physics.

43. The ability to use computers for physics research. Distinctive features of education in other countries.

44. Methods of studying the main courses of mechanics. Methods of introduction of the main points of kinematics: material yield, system failure, transition, speed, increase.

45. Methodology of introduction of basic dynamics: mass, sila. The laws of conservation in the mechanics, show their connection with their freedom and time.

46. Methodological issues of the course of molecular physics. Method of shaping the crown: mole, temperature. Thermodynamic characteristics (heat, work, internal energy, related and unrelated processes). Learn the method of induction of the formation of an ideal Gaza.

47. Methods of shaping the course of electrodynamics: electric charge, electric field, pressure of electric field, potential.

48. Methods of forming ponyatiy: magnetic field, magnetic induction, sila Lorenza.

49. Methods of formation of personal mechanical and electromagnetic fields. Mathematical pendulum, Collet contour. Methods of forming ponyatiy: mechanical and electromagnetic fields. The yavlennye resonates.

50. Methods of forming quantum physics, quantum properties of light.

III. Spisok used by istochnikov

Osnovnaya:

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3. Taubaeva Sh.T. Methodology and methodology of didactic research. The training manual. Almaty: Kazakh University, 2015. 246 p

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5. The credit system of higher education. Almaty: Kazakh University, 2006. 180 p.

6. Andreeva G.M. Social psychology. Moscow: Aspect Press, 2009. 432 p.

7. Aronson Elliot, Wilson Tim, Eikert Robin. Social psychology. Psychological laws of human behavior in society. – ST. PETERSBURG, prime-EUROZNAK, 2008. – 560 p.

8. Bern E. The games people play: The psychology of human relationships / Eric Bern; translated from English by A. Gruzberg. Moscow: Eksmo, 2012. 353 p.

9. Bern E. People who play games: The psychology of human destiny / Eric Bern; translated from English by A. Gruzberg. Moscow: Eksmo, 2012. 574 p.

10. Burlachuk L.F. Psychodiagnostics of personality. – Kiev, 2009. - 300 p.

11. Irodov I.E. Problems in general physics: textbook. handbook for universities / I. E. Irodov. - 10th ed. - M. : BINOM. Lab. znanie, 2014. - 431, [2] p.

12. Savelyev I. V. Course of general physics: textbook. manual: in 5 volumes / I. V. Savelyev. - 5th ed., ispr. - SPb.; M.; Krasnodar: Lan. - 2011. - ISBN 978-5-8114-1206-8 Vol. 1: Mechanics. - 336 p

. 13. Trofimova T.I. A short course in physics: with examples of solving problems: textbook. manual / T. I. Trofimova; Textbook.-method. The Klass. Textbook center. - 4th ed., ster. - M.: KnoRus, 2015. - 279s.

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15. Akhmetova G.K. Strategy of educational innovations: continuity of multilevel education: a monograph / G. K. Akhmetova, G. N. Parshina; KazNU named after al-Farabi. Almaty: Kazakh University, 2007. 185, [2] p.

16. Aitbayeva A.B. Art methods in education: textbook. manual / A. B. Aitbayeva, G. A. Kasen; KazNU named after al-Farabi. Almaty: Kazakh University, 2018. 203 p.

17. Zhanabaev Z.Zh., Tyntaeva Sh.B., Zholdasova H.B. Theory and methodology of teaching physics. Almaty: Kazakh University, 2007. 135 p.

18. Kamenetsky S.E., Purysheva N.S., Vazheevskaya, N.E. and others. Theory and methods of teaching physics at school: General questions/, Moscow, 2000, 368 p.

19. Kamenetsky S.E., Purysheva N.S., Vazheevskaya N.E. and others. Theory and methodology of teaching physics at school: Private issues: A textbook for students. Higher education. Studies. Moscow: Publishing house of the Center "Academy", 2000.

20. Physics workshop for classes with advanced study of physics/ Edited by Yu. I. Dik, O.F. Kabardin, Moscow, 1993, 208 p.

21. Periodicals: "Physics at school", "Quantum", "Successes of Physical Sciences", "Computer Science, Physics, Mathematics" (in Kazakh), "New in life, science, technology. Ser.physics".

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Additional:

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5. Antonov L. I. methodology of solving problems of electricity [text] : учеb.-method. complex / L. I. Antonov. - M.: izd-Vo MGU, 1982. - 167 c.

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