

1. CHARACTERISTIC OF THE EDUCATIONAL PROGRAM

The purpose of the educational program: Preparation of Masters for a professional career in the field of theoretical, experimental and Applied Physics.

1.1 GENERAL INFORMATION

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|---|---|
| Type of educational program | current |
| Name of the educational program | 7M05301-Physics |
| Field of education | 7M05 Natural sciences, mathematics and statistics. |
| Training direction | 7M053 Physical and chemical sciences. |
| The group of the educational program | M090 Physics. |
| License to engage in educational activities | The Educational program is implemented on the basis of the Appendix to the License № 12018901 in the direction of training 7M05301-Physics, issued by the Committee for control in the field of education and science of Ministry of Education and Science of the Republic of Kazakhstan. |
| Number and Date of Registration/ Update in the Register of EP | No. 7M05300023, «27» July 2022. |
| Educational level by NQF | Master's degree, level 7 |
| Awarded degree | Master of Natural Sciences in the Educational Program "7M05301-Physics". |
| Accreditation | <i>Institutional accreditation:</i> Kazakh national women's teacher training university, No. AA 0160 from 24.05.2019 to 23.05.2024. |
| Rating of the educational program | |
| The total amount of academic credits | 120 |
| Study duration | 2 years |

1.2 VISION, MISSION, PROGRAM GOAL, VALUES, UNIVERSITY GRADUATE ATTRIBUTES

Vision:

An intellectual platform that develops educators who are open to new ideas and able to lead in a rapidly changing world.

Mission:

Developing teacher leaders, who can create, develop, and disseminate advanced knowledge and values in education for the benefit our country and the world.

Program goal:

Our University aims to become a hub for innovative teaching, learning, research as well as the development of rural education in Central Asia.

Values:

Integrity, commitment, care.

University graduate attributes:

- Self-guided learners and reflexive practitioners
- Responsible personalities with moral and ethical values
- Professionals with deep subject knowledge and digital skills
- Creative and critical thinkers and excellent team players and communicators
- Adaptive leaders in teaching and learning
- Diverse, inclusive and for equality of opportunity in society

1.3. THE RATIONALE BEHIND THE EDUCATION PROGRAM

The educational program 7M05301-physics is developed taking into account the best modern domestic and foreign master's programs in the field of physics. The educational program 7M05301-physics is aimed at providing undergraduates with in-depth knowledge in the field of theoretical and Applied Physics about the structure and properties of matter and fields, about the phenomena underlying physics, about the modern physical picture of the world. formation of research skills and preparation of undergraduates for further education in doctoral studies in the relevant specialty.

1.4. DISTINCTIVE FEATURES OF THE EDUCATIONAL PROGRAM

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|------------------------------|---|
| Academic mobility | University of Westminster (London, UK) |
| Double-degree program | University of Westminster MIT (Cambridge, Massachusetts, USA) |
| Additional education (Minor) | 1. Counselor-organizer |

Coincidence with similar EP of leading universities in the near and far abroad

- 1) Massachusetts Institute of Technology (MIT, USA, No. 1 in the QS University Rankings) - 77%;
- 2) with Stanford University (Stanford University, USA, No. 2 in the QS University Rankings) - 70%.

1.5. GRADUATE CAREER OPPORTUNITIES

Objects of professional activity of graduates who have mastered the educational program 7M05301-Physics:
 physical systems of different scales and levels of organization, the processes of their functioning;
 physical, engineering-physical, biophysical, chemical-physical, medical-physical, environmental technologies;
 physical examination and monitoring.

1.6. AREAS OF PROFESSIONAL COMPETENCE

Master of Natural Sciences under the educational program 7M05301-physics can carry out the following professional activities:

Area of professional competence 1

The areas of professional activity of graduates who have mastered the educational program 7M05301-Physics include the study and study of the structure and properties of nature, at various levels of its organization, from elementary particles to the world, the fields and phenomena underlying physics. new methods of studying the Basic Laws of nature, all types of physical phenomena observed in nature, processes and structures of public and private scientific and production organizations related to the solution of physical problems, in educational institutions of higher education and professional education organizations; general educational organizations

Area of professional competence 2

Research activities in the field of physics; teaching activities in the field of physics.

Area of professional competence 3

The educational program 7M05301-physics is aimed at mastering all types of professional activities for which a graduate is preparing.

1.7. EDUCATIONAL PROGRAM LEARNING OUTCOMES:

LO 1 - recognize themselves as citizens of the world and responsible members of the digital society, promote the safe use of digital information and technologies, compliance with ethical and legal standards.

LO 2 – Undergraduates show openness to new knowledge, show a research interest in obtaining and analyzing information.

LO 3 – Able to easily communicate in different communities, in 3 languages, have the skills to effectively convey ideas, know how to manage a team and be part of it, create an inclusive environment, are adaptive and open to new knowledge.

LO 4 – He studies the urgent problems of modern philosophy of science, the professional foundations of orientational and verbal communication (listening, reading, speaking, writing), the skills of working with business correspondence (writing, e-mail, etc.);

LO 5 – Uses the theoretical and methodological foundations of the development of science, teaching methods, management and development processes, the nature and content of psychological and pedagogical research in professional activities;

LO 6 – Applies modern teaching methods and techniques, technology in its pedagogical activity in Higher education institution;

LO 7 – Plans and conducts analytical and numerical calculations, theoretical and experimental problems, scientific work in the field of theoretical, experimental and applied physics;

LO 8 – Conducts physics experiments of various complexity on devices;

LO 9 – Processes information using modern programs, tools and methods of computer and information technologies;

LO 10 – Develops physical, mathematical, computer models of the studied phenomena and processes;

LO 11 – Formulates the acquired knowledge and skills in the field of physics in his further professional activity;

1.4 graduate portrait

Attributes of a graduate of kaznatszhenpu:

AB 1-deep professional knowledge and understanding of the field under study;

AB 2-has emotional and social intelligence;

AB 3-adaptation to global challenges;

AB 4-has leadership qualities;

AB 5-has entrepreneurial skills, is able to identify and solve problems;

AB 6-indicates innovative thinking.

Matrix for correlating EP learning outcomes with graduate attributes

| | LO 1 | LO 2 | LO 3 | LO 4 | LO 5 | LO 6 | LO 7 | LO 8 | LO 9 | LO 10 | LO 11 |
|-------------|------|------|------|------|------|------|------|------|------|-------|-------|
| GA1 | * | | | * | * | | * | | * | * | |
| GA 2 | | * | | | * | | | | | | * |
| GA 3 | * | | | * | * | * | * | | | * | * |
| GA 4 | | * | * | | | * | | * | | | |
| GA 5 | | | * | | | * | | * | | | |
| GA 6 | | | | * | | | * | | * | * | * |

1.8. REFERENCES

The educational program is developed based on the following legal acts:

1) professional standard" teacher "(approved by the Order of the chairman of the Board of the National Chamber of entrepreneurs of the Republic of Kazakhstan dated June 8, 2017 No. 133);

2) sectoral qualification ranks in the field of Education (approved by the minutes of the meeting of the sectoral Trilateral Commission for social partnership and regulation of social and labor relations under the Ministry of Education and science of the Republic of Kazakhstan dated June 20, 2022 No. 2).

2. CONTENT OF THE EDUCATIONAL PROGRAM

| № | Module name | Acad. credits | № | Number and name of discipline | Acad. credits | Cycle / discipline component |
|------------------------------|---|---------------|---|--|---------------|------------------------------|
| 1 | BM-1 Integration of science and education | 16 | 1 | History and philosophy of science | 4 | CC UC |
| | | | 2 | Foreign language (professional) | 4 | CC UC |
| | | | 3 | Higher School Pedagogy | 4 | CC UC |
| | | | 4 | Psychology of management | 4 | CC UC |
| 2 | Innovative methods and technologies in teaching physics IMPF-2 | 20 | 1 | Basic principles of modern physics | 5 | MC UC |
| | | | 2 | Planning and organization of scientific research | 5 | CC OC |
| | | | | Physics of open nonlinear systems | | CC OC |
| | | | 3 | Computer technologies in science and education | 5 | CC OC |
| | | | | Selected chapters of thermo physics | | |
| | | | 4 | Fundamentals of relativity theory | 5 | CC OC |
| Numerical methods in physics | | CC OC | | | | |
| 3 | Special chapters of modern physics SGSF-3 | 38 | 1 | Astrophysics and cosmology | 5 | MC OC |
| | | | | Additional chapters of theoretical physics | | MC OC |
| | | | 2 | Fundamentals of Materials science and Nanotechnology | 5 | MC OC |
| | | | | Introduction to theory of the gravity | | MC OC |
| | | | 3 | Alternative Energy Sources | 5 | MC OC |
| | | | | Modern physical experiment | | MC OC |

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|---------------|---|------------|---|--|------------|---------------|
| | | | 4 | Jet theory | 5 | MC OC |
| | | | | Fundamentals of aerohydrodynamics | | MC OC |
| | | | 5 | Elementary particle physics | 6 | MC OC |
| | | | | High energy physics | | MC OC |
| | | | 6 | Design and modeling of new materials | 6 | MC OC |
| | | | | Modern optics | | MC OC |
| | | | 7 | Condensed matter physics | 6 | MC OC |
| | | | | Quantum theory of solids | | MC OC |
| 4 | Professional training module PTM-4 | 34 | 1 | Pedagogical practice | 4 | UC |
| | | | 2 | Research practice | 6 | UC |
| | | | 3 | Undergraduate research work, including internships and the implementation of a Master's thesis (MRW) | 24 | RW |
| | | 12 | 4 | Registration and defense of the Master's thesis (RDMT) | 12 | Final control |
| TOTAL: | | 120 | | | 120 | |