ҚАЗАҚСТАН РЕСПУБЛИКАСЫ БІЛІМ ЖӘНЕ ҒЫЛЫМ МИНИСТРЛІГІ	МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РЕСПУБЛИКИ КАЗАХСТАН	THE MINISTRY OF EDUCATION AND SCIENCE OF THEREPUBLIC OF KAZAKHSTAN

ОҚМПУ SOUTH KAZAKHSTAN STATE PEDAGOGICAL UNIVERSITY

ОҢТҮСТІК ҚАЗАҚСТАН МЕМЛЕКЕТТІК ПЕДАГОГИКАЛЫҚ УНИВЕРСИТЕТІ	ЮЖНО-КАЗАХСТАНСКИЙ ГОСУДАРСТВЕННЫЙ ПЕДАГОГИЧЕСКИЙ УНИВЕРСИТЕТ	SOUTH KAZAKHSTAN STATE PEDAGOGICAL UNIVERSITY

Университетінің Ғылыми кеңесінде бекітілген, кеңес төрағасы Оңтүстік Қазақстан мемлекеттік педагогикалық университетінің Басқарма төрағасы-Ректор , т.ғ.к., доцент	Утверждено на Ученом совете университета, председатель совета председатель Правления-Ректор Южно-Казахстанского государственного педагогического университета, к.и.н., доцент	Approved by the University Academic Council, Chairman of the Board- Rector of the South Kazakhstan State Pedagogical University, Candidate of Hictorical Sciences, Accociate Professor
_____Г.Д. Сугирбаева		
Хаттама № 10, « 30.06 » 2021 ж.	Протокол №10,«30.06»2021 г.	Protocol №10 «30.06 »2021

БІЛІМ БЕРУ БАҒДАРЛАМАСЫ
6В01502 ФИЗИКА МҰҒАЛІМІН ДАЯРЛАУ

ОБРАЗОВАТЕЛЬНАЯ ПРОГРАММА
6В01502 ПОДГОТОВКА УЧИТЕЛЯ ФИЗИКИ

EDUCATIONAL PROGRAM
6B01502 TEACHER TRAINING OF PHYSICS

Шымкент 2021

EDUCATIONAL PROGRAM

6B01502 TEACHER TRAINING OF PHYSICS

Code and Classification of the field of education:	6B01 Pedagogical Sciences
Code and classification of training course:	6B015 Teacher training of in Natural Sciencts
Awarded degree:	Bachelor of Education in the educational program «6B01502 Teacher training of Physics»
Type of program:	Bachelor, the 6th level NQF/ SQF / ISCE
Total amount of credits:	240 Academic credits / 240 ECTS

The educational program was reviewed at the of the Council of the faculty of Physics and Mathematics and recommended for approval by the Acagemic Council of the University.

Protocol *No* 11 «28.06» *2021*

The educational program was approved by the decision of the Academic Council of the University and put action.

Protocol *No* 10 «30.06» *2021*

Agreed:

Vice-rector for educational and methodical work _____ Isabek B.K.

Head of the Department of Academic Affairs _____ Berdaliev D.T.

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Director of JSC "Orlen" of the city of Shymkent
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Director of school-gymnasium № 47 named after T. Tazhiberyev _____ Ospanov Zh. S.

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№	Full name	Position	contact number
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Abbreviations:

NQF - National Qualifications Framework
IQF - Industry Qualifications Framework
ISCE - International Standard Classification of Education
EP - Educational Program
WC - Working curriculum
CED - Catalogue of elective disciplines
KC - Key competencies
LO - Learning Outcomes
ICT - Information and communication technologies
IC - Interim control
CC – Current control
FG - The final grade
GED - General educational disciplines
BD - Basic disciplines
SD - Specialized disciplines

CONTENT

INTRODUCTION

This educational program (hereinafter - EP) is a normative document of a conceptual nature, based on the goals and values of university education, containing general information about the professional activities of graduates, aims and objectives of EP of competence graduate model, the expected learning outcomes and policies of their evaluation of methods and methods of organization of educational process on the content of the program.

The main directions of EP:

- implementation of the educational policy of the University;
- the introduction of the trilingual education through the organization of educational process in the Kazakh, Russian and English languages;
- improving the quality of the learning process on the basis of competence approach;
- the willingness of students to educate themselves throughout their lives;
- formation of the outlook of students, develop their creativity, communication, critical thinking, research and information capabilities.

EP is the basis for the development of the following documents:

- Catalogue of elective disciplines (CED);
- Academic calendar of the educational process;
- Individualized Education Plan (IEP);
- working curricula (WC);
- Working program of educational disciplines (Syllabus);
- educational complex disciplines (ECD);
- the expected results in the disciplines of learning;
- criteria for assessing the disciplines of learning outcomes;
- documents on the organization of all types of professional practice, as well as other documents necessary for the educational process.

1 SHEET OF THE EDUCATIONAL PROGRAM

1.1 Scope of professional activity of graduates

Bachelor of EP 6B01502 "Preparation of the teacher of physics" carries out his professional activities in the field of education.

1.2 The objects of professional activity of graduates:

- basic and specialized schools;
- specialized schools;
- the organization of technical and vocational post-secondary education.

1.3 Types of professional activity of graduates:

- training;
- bringing up;
- methodical;
- research;
- social and communicative.

1.4 Objectives of professional activity of graduates

Educational:

- training and development of students;
- the organization of educational process in professional activities;
- design and management of the pedagogical process;
- diagnosis, correction and prediction of the results of educational activities.

Nurturing:

- the involvement of students in the system of social values;
- implementation of educational work in accordance with the laws, the laws, the principles of the educational process, educational mechanisms;
- planning extracurricular educational work;
- addressing specific educational objectives;
- the use of various forms and methods of training and education of students in extracurricular activities;
- establishment of links with groups of students, subject teachers and parents.

Guidelines:

- implementation of methodological support of the educational process;
- planning the content of education at different levels;
- identification of methods for the organization and implementation of the educational process;
- the use of new educational technologies in the learning process.

research:

- study the level of mastering the content of education, the study of the educational environment;
- study of scientific and methodical literature;
- analysis and generalization of the advanced pedagogical experience in the field of education;
- conducting of pedagogical experiment, the introduction of its results in the educational process.

Social and communicative:

- the implementation of cooperation with the professional community and all interested education stakeholders;
- the formation of a multicultural identity;
- creation of favorable conditions for education and development of students, providing them with educational support.

2 SOFTWARE FEATURES OF EDUCATIONAL

EP higher education 6B01502 "Preparation of the teacher of physics" designed in accordance with the European Qualifications Framework, National Qualifications Framework, the Dublin descriptors, Industry frame of qualifications, professional teacher standards to meet the requirements of the regional labor market and employers.

EP determines goals, expected results, conditions and techniques of the educational process, the realization of quality assessment preparation graduate in this area, the contents of the working curriculum.

In order to generate additional competence in the basic educational program included Major Minor additional educational program: computer physics, and astronomy. During the development of the program were discussed training programs leading pedagogical universities of Russia (Tomsk State Pedagogical University, Moscow State Pedagogical University, Lomonosov Moscow State University), Turkish Sakarya State University, European universities (University Łodzkie) of Cambridge, University of Oxford.

3 PURPOSE AND VALUES EDUCATION PROGRAM

3.1 The purpose and objectives of the educational program

The main objective of OP is defined in accordance with the objectives of the Strategic Plan and the development of the University's mission.

***Purpose of the Educational Program*:** Preparation of competitive Physics-Computer Science teacher owns the general cultural and professional competences in accordance with the requirements of the labor market and national qualifications systems.

***Tasks of the educational program**:*

1. formation of core competencies needed for effective implementation of the professional activities of students;
2. the formation of social responsibility training based on interpersonal values and professional ethics;
3. bringing the level of quality of education in line with the requirements of national and international standards on the basis of motivation of training to professional development, self-realization;
4. the formation of students' professional knowledge and practical skills based on the updated content of education;
5. providing training of highly educated professionals who are actively involved in the modernization of society on the basis of language trinity, functional literacy, healthy lifestyle.

3.2 Values of the Educational Program

The core values defined in the contents of EP:

- Kazakhstan patriotism and civic responsibility;
- honesty;
- respect;
- cooperation;
- openness.

4 GRADUATE MODEL

1.Subject areas: widely and deeply understands its subject area, applies knowledge in professional activities.

2.Organizational and methodological skills: uses innovative technologies in planning, organization and management of professional activities, shows critical thinking and creativity in solving complex problems.

3.Research skills: conducts scientific and methodological work, attracts students to research work.

4.Leadership and entrepreneurial skills: able to work in a team, is active in the renewal of society.

5.Cultural competence: has the ability to be a cultural and tolerant citizen of his country.

6.The ability to learn throughout life: coordinating their talents and interests in accordance with the needs of society.

7.Information skills: understands the essence of the information society, uses ICT in professional activities.

5 EXPECTED RESULTS training on educational programs

Learning outcomes of OP: Upon successful completion of this OP student must:

LO1 - It demonstrates knowledge in the field of physics in the interpretation of phenomena and processes in nature and technology, solving problems, the experiment;

LO2 - Is able to substantiate the role of physics and astronomy in the development of social and economic society, in science; explains physical processes and their dependence.

LO3 - Knows how to use ICTs, digital educational resources in the modeling of physical processes, processing, analysis of the experimental results, the study of the discipline;

LO4 - It summarizes the scientific models and evidence, the results of experiment and research to provide projections, statements and explanations;

LO5 - Knows how to choose the basic mathematical structures and systems of axiomatic methods for solving a given situation;

LO6 - It uses the methods of teaching and assessment, innovative technologies in accordance with the goals and objectives of training and individual characteristics of the students;

LO7 - Knows how to use interdisciplinary integration in the description of a holistic image of the world in order to achieve the planned results in the discipline of study; mastering the methods of scientific research and academic writing.

LO8 - It Solves problems that arise in various areas of interpersonal, social, and professional communication based on pedagogical, psychological, physiological, humanitarian, economic, and environmental knowledge;

LO9 -It demonstrates interpersonal communication, teamwork skills and information culture; understands the importance of the principles and culture of academic integrity.

LO10 - It evaluates the creativity of solutions to problems arising in conflict situations, in the practice of technology and inclusive education; uses knowledge in solving practical and professional tasks.

LO11 - It acquires learning skills that contribute to the independent continuation of physical knowledge, it uses the technology of criteria-based assessment, diagnosis, development of short-term curricular

6 POLICY ASSESSMENT OF EDUCATIONAL ACHIEVEMENT

Assessment of learning outcomes of students carried out various forms of current, boundary control, as well as interim and / or final certification, determined by the University.

Evaluation is carried out in accordance with Table 1 by score-rating letter system.

Conformity of learning outcomes and evaluation methods

Learning outcome	Evaluation method
ON 1,2,3, 5,6,7,8,10,11	Activity in the classroom
ON 2,4,7	Essay
ON 2,3,9	Group presentation
ON 4,6,9	Project preparation(group work)
ON 1, 3, 5	Personal assignment
ON 1,2,9	Tasks on laboratory works
ON 3, 6, 8	Portfolio
ON 6,8,10,11	Accounting practices
ON 1-11	Boundary control
ON 1-11	Final certification

Ongoing monitoring of learning outcomes is performed on each subject discipline during the classroom and extracurricular activities.

Landmark control is carried out during the academic period twice within a given discipline.

The final grade for the discipline is 30% of the current control, 30% - from the boundary control, the remaining 40% - on the exam. Students who score at least 30 points (a passing score of 0.15 * (IC1 + CC1 + IC2 + CC2) ≥ 30 points) from interim control and current control are allowed to take the exam.

intermediate certification results calculated by the formula:

final grade (FG) = **0,15 * IC1+0,15 * IC1+0,15 * IC2+0,15 * IC2+0,4 * E**

Current control 1 (CC1) ≤ 100

Landmark control 1 (LC1) ≤ 100

Current control 2 (CC2) ≤ 100

Landmark control 2 (LC2) ≤ 100

Exam ≤ 100 (e)

Table 1. Point-rating alphabetic system of evaluation taking into account educational achievements of students with their transfer to the traditional rating scale and ECTS

the traditional rating scale and ECTS

Evaluation of letter system	Digital equivalent	Points (% bonus content)	Evaluation of traditional system
A	4.0	95-100	Excellent
A-	3.67	90-94	
B+	3.33	85-89	Good
B	3.0	80-84	
B-	2.67	75-79	
C+	2.33	70-74	
C	2.0	65-69	satisfactorily
C-	1.67	60-64	
D+	1.33	55-59	
D-	1.0	50-54	
FX	0.5	25-49	unsatisfactorily
F	0	0-24	

7. ways and methods of organization of educational process

Organization of educational process is carried out on credit technology based on the choice of studying the discipline, order the development of disciplines and modules.

Tasks of the organization of educational process*:*

- unification of knowledge;
- creation of conditions for maximum individualization of instruction;
- strengthening the role and effectiveness of independent work of students;
- Identification of educational achievements of students on the basis of an efficient and transparent procedures for their control.

Training opportunities on credit technology:

- the introduction of academic credits system to assess the labor costs of students and teachers in each discipline;
- participate in the formation of the individual curriculum;
- the choice of subjects and modules in the catalog of elective courses;
- the freedom to choose teacher training;
- the choice of an educational path with the help of student advisors;
- the use of interactive teaching methods;
- academic freedom in the formation of educational programs;
- providing of training necessary teaching and learning materials;
- the use of effective methods of control of educational achievements of students;
- the use of score-rating system of evaluation of educational achievements of each discipline, and other forms of self-study.

The methods and technologies of training:

- reflexive techniques considered as a central object of study;
- competence-based approach to learning;
- role-playing games;
- educational discussions;

- Case Study;
- design methods.

Types of methods and technologies of training to choose the teachers themselves.

Methods for achieving learning outcomes	**Learning outcome**										
	ON 1	ON 2	ON 3	ON 4	ON 5	ON 6	ON 7	ON 8	ON 9	ON 10	ON 11
Lecture	+		+		+	+		+			
Practical method	+		+		+						+
Seminar						+		+			+
Laboratory method	+	+			+				+		
Interactive lecture	+		+								
Project method			+	+			+				
Case study	+			+	+			+		+	
Educational debate		+				+				+	
Group work			+						+		+
Problem-based learning						+	+	+			
Method of reflexive learning		+		+		+		+		+	
Dialog training		+					+		+		
Critical learning				+						+	+

Internal quality assurance system educational activities aimed at improving the quality of educational services is determined by:

- policy in the field of quality assurance;
- development and approval of ongoing educational programs;
- studentorientirovannym learning, teaching and assessment;
- admission of students, academic performance, recognition and certification;
- teaching staff;
- training resources and support training systems;
- information management;
- informing the public;
- continuous monitoring and periodic program evaluation;
- periodic external quality assurance.

Professional practice

Professional practice is a required component of study the student.

In accordance with the specific OP organizes the following practices:

- training;
- language;
- teaching;
- Production; Elements

the model of a graduate

- pre-diploma.

The purpose of the training practice - the acquisition of primary professional competences, including the consolidation and deepening of theoretical knowledge acquired during the training, laying the foundations of research, paperwork and working with business correspondence, acquisition of practical skills and work skills.

Teaching practice is organized for all students, is conducted in accordance with the characteristics and direction of the OP, is considered at a meeting of the department and is reflected in the program of practice.

The purpose of language practice is the formation of students' skills of interpretation and translation, business communication skills and networking, including native speakers.

Language practice is conducted for students engaged in training with knowledge of languages, in English and of multilingual groups.

The purpose of teaching practice - consolidation and deepening of knowledge of general scientific, cultural, psychological and pedagogical, methodical and special disciplines, as well as the formation on the basis of theoretical knowledge of pedagogical skills and competences.

Internship held in institutions, organizations and enterprises, relevant profile training of students.

Undergraduate practice carried out on senior year for students who perform graduate work. Manual pre-diploma practical exercises supervisor of the thesis

8 CONTENT OF THE EDUCATIONAL PROGRAM

8.1 Matching the learning outcomes of the OP to the graduate model

The results of training determine the graduate's models formed after the completion of the OP

Matrix of correlation of learning outcomes in the OP with the graduate model

MB	ON1	ON2	ON3	ON4	ON5	ON6	ON7	ON8	ON9	ON10	ON11
1			+					+	+	+	
2								+	+		
3			+		+	+	+	+		+	+
4			+	+		+		+	+		+
5	+	+	+	+	+	+	+	+	+	+	
6	+	+	+	+				+	+	+	
7		+			+			+			

8.2 Information about the modules

Number	Name of the module	The results of training modules	component module	Brief description of the module (30-50 words)	Cycle	Amount of credits	The elements of the model of a graduate
1	The module of general subjects	**ROM1** - to assess their surroundings on the basis of philosophical principles. **ROM2** - to show citizenship. **ROM3** - to use the methods of scientific knowledge. **ROM4-** to assess the situation of social and professional interpersonal communication. **ROM5** - solve problems that arise in professional communication. **ROM6** - interpret using language means their thoughts in speech and writing **ROM7** - use of ICT in their professional activities. **ROM8** - apply the methods and means of physical culture as the foundation of a healthy lifestyle.	The modern history of Kazakhstan Philosophy Socio -political knowledge Legal, economic and environmental knowledge Kazakh (Russian) language Foreign language Information and communication technologies Physical culture	The module aims to: - formation of ideological, civil and moral position of the future expert; - increase its competitiveness on the basis of mastering of information and communication technologies; - development of the ability to communicate in the state, Russian and foreign languages; - promoting healthy lifestyles, self-improvement and professional success; - the development of competencies in the field of economics and law, anti-corruption culture basics of ecology and life safety, skills, entrepreneurship, leadership, receptivity to innovation.	GED	56	1, 2, 7
2	Pedagogy and	**ROM1** - choose the methodology of	Physiological and psychological development of pupils	The module examines:	BD **SD**	22	3,4

	methodology of educational work	pedagogical analysis. **ROM2** - to generalize the findings. **ROM3** - use of psychological and pedagogical knowledge in new conditions. **ROM4** - to use national and international experience of educational work **ROM5** - use professional communicative and teamwork skills **ROM6** - to solve the problems associated with age-related disabilities enrolled. **ROM7** - to put into practice the methods of training and education of children with special educational needs.	Pedagogy and methodology of educational work Special educational technology in inclusive education Language practice Pedagogical practice	- the essence of the anatomical and physiological, psychological characteristics of children and adolescents, aspects of identity formation through the preservation and promotion of health; - Actual problems of methodology, stages of development of pedagogical science, the concept of a holistic pedagogical process; - methods, forms, means of educational work in modern pedagogy; - the specificity of the organization and design of inclusive education, psychological and pedagogical support for children with special educational needs (PLO), especially the use of information and communication technologies (ICT) in inclusive education.			1,3.4
3	**Module Mathematics and informational training**	ROM1-generalizes mathematical knowledge and concepts in the system of other disciplines; ROM2-applies mathematical knowledge in practice to solving problems based on system thinking; ROM3-defines the basic laws of physics and mathematical transformations;	Mathematics Phyton Programming 1. Methods of mathematical physics 2. Mathematical equations of physics	The module is considered definite and indefinite integrals, the theory of series, differential equations and elements of probability theory. The basic concepts of computer science: programming language, as well as the methods of mathematical physics,as well	BD	17	3,5,6,7,8, 10,11

		ROM 4-uses classification and differential equations to calculate		as knowledge of mathematics as a whole science, the role of "mathematical physics," Cauchy problem for partial differential equations, the existence of boundary value problems			
4	**General physics module**	**ROM** 1 understands the role of the fundamental laws of physics; **ROM** 2- Apply the laws and theories in practical situations; **ROM** 3 It is critical of the methods and results of physical controls and experiments for their development; **ROM** 4- It summarizes the plan of scientific models and evidence for submission to the laws of astronomy in the form of tables, graphs; **ROM** 5- arranges the level of interaction of teachers and students in the tasks of different levels; **ROM** 6 able to carry out research at various levels in solving physics experiments and tasks;	School physics course Mechanics Molecular physics Electricity and Magnetism Optics Physics of the atom and the atomic nucleus Astronomy Educational practice	The study of this module includes: the development of students' understanding of the role of the fundamental laws of physics as the basis for the description and analysis of the nature of various phenomena of the surrounding world; acquisition of knowledge and skills for solving practical problems; the formation of students' basic physical concepts to develop skills for independent scientific research methods and thinking; building skills to apply the knowledge in the future professional activity.	BD	41	1,3,4, 6
5	**Theoretical Physics module**	**ROM** 1 - understands classical physics, the basic laws of quantum physics; **ROM** 2- It uses new approaches to improve the understanding of the theoretical modules; **ROM** 3- organizes scientific arguments in the decision of tasks of different levels of theoretical physics; **ROM** 4- the ability to apply knowledge in	Classical mechanics and electrodynamics Quantum mechanics Statistics physics and fundamentals of physical kinetics 1. Research and development of synergetics and physics 2. History of Physics	The content of this module provides students with the fundamental concepts of the basic approaches to the description of real physical processes and phenomena, both the classical and the quantum level; formation of students' systematic knowledge about methods for solving	BD **SD**	**26**	1, 3, 4, 6 1, 4, 6

		solving physical problems in the leveled tasks; **ROM** 5- able to systematically apply knowledge in solving practical problems of laser technology **ROM** 6 demonstrates the methods of investigation of the physical properties of solids kondesirovannyh	Computer methods of physics	practical problems of solid state physics and quantum physics based on advanced mathematical models describing physical objects; the development of scientific thinking and in-depth knowledge for a successful future career in education.			
6	**Methods of teaching and learning physics at school**	**ROM1-**analyzes information about modern problems of physics; ROM2-the ability to work independently and solve critical problems, adapts to new conditions; **ROM3-**uses methods for processing the results of experiments and measurements, determining the dependencies between physical quantities; **ROM 4-**shows creative abilities in solving physical, Olympiad, experimental problems; **ROM5-**analyzes the research of the world's leading, domestic teachers-practitioners, ways of effective teaching, concerning the concentration of students ' attention, the study of counting skills; **ROM6-**systematizes the level of interaction between teachers and students in education when solving problems of various levels; **ROM7-**a physicist makes a decision in choosing advanced methodological technologies, taking into account age characteristics, intellectual abilities of students at school. **ROM 8-**uses the technologies of criterion	Methods of teaching physics Workshop on solving physical problems Methods of individual and distance learning in physics Technique of physical experiment at school Methods of scientific research and information letter	The module is dedicated to direct the development of students 'practical skills for teaching in the school course of physics, namely, the mastery of technique solutions of standard and non-standard physical problems, formulation and implementation of school experiments and demonstrations, explore a new theme and objective assessment of students' knowledge and and methods activating students in physics classes.	BD **SD**	42	1, 3, 6,7

		assessment, drawing up a short-term lesson plan	Pedagogical practice				
7	**Minor: Applied physics module**	**ROM 1-**depicts individual physical tasks, its model in the form of a diagram, graph. **ROM 2-**shows methods for studying the physical properties of condensed solids **ROM 3-**explains optimal ways to optimize many large-scale physical tasks using a computer; **ROM 4-**learns the model of physical problems using a computer, changes and classifies as necessary, **ROM 5-**knows the limits of using high technology in everyday life;	Fundamentals of nanotechnology and nanomaterials Condensed matter physics Introduction to programming for physicists Radionics	Methods of solving complex physical problems with a computer program, condensed matter Physics based on modern mathematical models, the role, history and prospects of high technologies in human life, the basics of nanotechnology, projection modeling, computer graphics, geometric modeling, development of student's media skills using modern capabilities, drive to the cyber future are considered	BD	20	1, 3, 6
8	**Minor: Physics and Astronomy**	**ROM** 1 - It demonstrates creativity in solving astronomical problems; **ROM** 2- performs astronomical laboratory work; **ROM** 3- applying knowledge obtained in practice; **ROM** 4 demonstrates knowledge of the celestial body, using modern technology; **ROM** 5- able to evaluate the knowledge in the study of the motion of the heavenly bodies.	Workshop on solving the problems of astronomy Fundamentals of astrophysics Methods of teaching astronomy Fundamentals of cosmology	Minor explains modern methods of teaching astronomy program effective teaching astronomy, astrophysics, physical laws, the internal structure of stars, the interstellar medium, the energy source of stars, galactic and cosmological elements.	BD	20	1, 3, 6
	Pre-diploma practice					**4**	
	Final attestation					**12**	
	Total					**240**	

8.3 Information about the disciplines

№	Name of the Discipline	Brief description of the discipline (30-50 words)	Amount of credits	Expected learning outcomes (codes)										
				LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10	LO 11
CYCLE general disciplines university component / elective component														
1	Legal, economic and ecological knowledge	The basic concepts and their relationships in the field of economy and business, the legal system and legislation of RK, state-legal and constitutional development, anti-corruption culture foundations, Ecology and Life Safety. Describes methods and analysis techniques and the use of legal and conceptual documents in acquiring entrepreneurial, leadership and innovative skills.	5									+	+	
Cycle of basic disciplines The university component														
2	Physiological and psychological development of pupils	On the basis of the laws of psycho-physiological development of pupils deals with the anatomical and physiological and psychological characteristics of children and adolescents, identity formation, preservation and promotion of health. Describes methods and techniques to identify and develop students' abilities, consolidate the relationship between the teacher and the student, the organization of work on children's health, physical	5						+		+	+	+	

		education, labor training.												
3	Pedagogy and methodology of educational work	On the basis of pedagogical science considered its goal, tasks, categories, structure, methodological bases, the main stages of development, the concept of the educational process, forms, methods and means of teaching and educational work. Describes the current problems of pedagogical science, the modern concept of education in the Republic of Kazakhstan, educational system of school and class and diagnostics of educational work	5				+		+		+	+		
4	Special educational technology in inclusive education	The basic concepts of inclusive education, particularly inclusive education in educational activities, current models of psycho-pedagogical support of the educational process in the conditions of inclusive education and the way of its implementation.	5						+			+	+	
5	Mathematics	The course deals with linear algebra, analytical geometry, differentials of functions with one variable, the theory of limits. The basic concepts of mathematics are analyzed from a high mathematical point of view, methods and techniques of solving problems, application in practice and evaluation criteria for solving problems are considered. In mastering the skills of problem solving describes the methods and techniques of analysis and use of theoretical and practical literature, the ways of integration of subject knowledge.	7				+	+				+		+
6	Phyton Programming	The discipline includes a series of lessons	5		+		+	+						+

		introducing basic data types, principles and concepts of structural and object–oriented programming (OBP), GUI programming. Analyzes the ways of modeling the graphical user interface using the Tkinter package, solving a problem based on game programming, the main possibilities of using modeling, develops the ability to work in a team, evaluates the way out of a controversial situation with the help of a solution.												
7	School physics course	The fundamentals of mechanics, mechanics, basics of molecular physics and thermodynamics, electromagnetic phenomena, oscillations and waves, light phenomena, basics of atomic and nuclear physics are considered in detail. The methods of calculation, application in practice, the analysis of methods of management of the basic physical phenomena, knowledge of a role in science, collection of experimental results, ways of integration of subject knowledge are described.	4	+	+		+			+				
8	Molecular physics	Discusses the structure of the bodies in a state of aggregation, a change in the result of external influence, the distribution of Maxwell-Boltzmann kinetic molecular theory of gases, the processes, laws of thermodynamics, phase equilibrium, transient processes, and the critical state of the substances, surface phenomena at the boundaries separating different phases. Methods of problem solving, laboratory work, generalization of results, practical application, substantiation of the role of the subject in science, ways of integration of subject	7	+	+		+			+				

		knowledge are described.												
9	Electricity and Magnetism	The laws of electrostaics, electric field, Coulomb's law, superposition principle, laws of direct, alternating current, Ohm's law, Kirchhoff's rules, physical bases of ampere's Law, Lentz's Joule, electric current in Gas, electrolyte, magnetic properties of substance, magnetic field are considered. Methods of solving problems, methods of measuring the main parameters, the place of electricity in a particular life, generalization of scientific evidence, ways of integrating knowledge are described in laboratory works.	6	+	+		+			+				
10	Optics	Examines the main phenomena, patterns, manifested in its interaction with matter, distribution, fault laws, light reflection, properties of the lens. Knowledge of geometrical, wave optics in society, technique, life, medicine, methods of solving problems, methods of measuring the main parameters in laboratory work, methods of integration of subject knowledge and determining the place of an object in a particular life are described.	6	+	+					+				
11	Physics of the atom and the atomic nucleus	The structure of the atom, its planetary theory, models of the atomic nucleus, the theory of elementary particles, the basic equations in atomic, nuclear physics, quartz structure and some properties of elementary particles are considered, methods of solving problems in the discipline, methods of measuring the basic parameters in laboratory work, ways of integrating subject knowledge, determining the place of the object in a particular life, creativity of solving the problem are described.	6	+	+					+			+	

12	Astronomy	Examines the General concepts of the structure, movement, development of celestial bodies, motivates the role of the developing model of the Universe in the development of science. Also considers the movement of celestial bodies, their systems, structure, appearance, model of celestial bodies. Describes the ways of using digital educational resources in the development of the results of the experiment, the ability to work together with the group, subject integration.	7		+	+				+		+		
13	Classical mechanics and electrodynamics	1. The General theory of the laws of motion of bodies, classical concepts of time, space, writing the laws of motion of a material point in different coordinates, Lagrange, Hamilton, Hamilton-Jacobi equations, Maxwell's system of equations, plane electromagnetic waves, relativistic covariance of electrodynamics equations, mathematical concept of mechanical problems are considered. the ways of application of innovative technologies and criteria assessment, information culture, integration of interdisciplinary knowledge are described	6						+	+		+		+
14	Classical mechanics and electrodynamics	The general theory of the laws of motion of bodies, classical concepts of time, space, writing the laws of motion of a material point in various coordinates, Lagrange, Hamilton, Hamilton-Jacobi equations, Maxwell's system of equations, plane electromagnetic waves, relativistic covariance of electrodynamic equations, mathematical concept of mechanical problems are considered. the ways of applying innovative technologies and criteria assessment, information culture, integration of	6						+	+		+		+

		interdisciplinary knowledge are described.												
15	Quantum mechanics	Methods of solving problems from quantum mechanics, the concept of the wave function, the Schrodinger equation, one-dimensional problems of quantum mechanics, mathematical apparatus, physical quantities, operators, elements of relativistic quantum mechanics are considered. The ways of using CBR in solving problems and integrating interdisciplinary knowledge are described.	5	+		+				+				
16	Computer methods of physics	1. Methodical bases of the solution of physical problems with use of the computer, demonstration of the physical phenomena, use of computer programs for performance of laboratory works, modeling of the physical phenomena controlled on laboratory occupations are considered. On the basis of ICT the methods of the organization of educational process, communication in performance of project works, rendering information culture, an assessment of creativity of the solution of the arising problems are described.	5			+	+					+		
17	Methods of individual and distance learning in physics	We consider ICT, e-learning environments, sdgs and their packages, packages of physically applied programs, web tools for training and monitoring and setting feedback. The article describes the ways of using the SDR for reasoning physical conclusions and solving problems, organizing the educational process based on ICT, communication skills in project work, information culture and integration of interdisciplinary knowledge	5	+		+				+		+		
Cycle of basic disciplines optionally component														

18	1. Methods of mathematical physics 2. Mathematical equations of physics	1. The theory of mathematical model of physical phenomena, mathematical model of construction of various physical fields and wave function in electrodynamics, acoustics, theory of elasticity, hydrodynamics, aerodynamics is considered. It is focused on the practical application of mathematical knowledge, the integration of subjects, the development of critical, positive thinking, the organization of the educational process using ICT.	4		+	+								
		2. Various equations, classification of differential equations, methods for solving the Cauchy problem for the wave equation, potential theory, Fourier method for solving boundary value problems for equations of hyperbolic and parabolic types on a scientific basis, focused on the application of mathematical and physical knowledge in practice, the integration of disciplines, the development of critical, positive thinking, the organization of the educational process using ICT.			+	+								

19	Fundamentals of nanotechnology and nanomaterials	The main types, properties, measuring effects of nanomaterial, theoretical foundations of physical and chemical methods of research of nanoparticles, methods of production, master functional nanomaterials, determine the scope of application in engineering, everyday life, manufacturing, medicine. In practical classes describes the communication, demonstration of information culture in the implementation of projects on nanorobotics, nanosome, nano-tubes, nanomolecules, microchips, analysis, problem solution, justification of the role and place of discipline in a particular life.	5	+	+							+		
20	Condensed matter physics	Discusses the General characteristics of the structure of crystals, amorphous substances, structure, physical properties kondensirovannykh solids, atomic structure of solids, vibrations of the grid, phonons, electronic territorial structure, phase transitions, complications, and develop technological civilization student, describes problem solving, analysis, problem solution, justification of the role and place of discipline in a particular life, the way of subject integration.	5	+	+									

21	Introduction to programming for physicists	The basics of computer robotics, linear, applied software packages, artificial intelligence, wireless technology, robotics, alternative energy, waste processing, nuclear, solar, hydrogen energy, biotechnology, biometrics, navigation technology are considered. It describes communication skills, Information culture in the implementation of project work using ICT, analysis of the problem solution, justification of the place and role of the subject in a particular life.	5	+	+	+						+		
22	Radio electronics	1. The element base of radio-electronic means and modern achievements of microelectronics, radio-technical circuits and signals, physical bases of semiconductor devices, analog, digital microelectronics, pulse devices are considered. The ways of solving problems and practical application of the basics of electronics, modeling in cognitive-scientific research, analysis of problem solving, substantiation of the role and place of the subject in a particular life are described.	5	+	+	+								
23	Workshop on solving the problems of astronomy	Discusses the astronomical coordination system, cracks breakage, the astrometric solution of the task in case of breakage, the time of measurement, Kepler's laws, methods and ways of solution of problems in stellar astronomy. To be able to solve cosmological problems, typical tasks on Hubble's law, to master the technique of solving problems related to body growth, lamp heights and their adaptation, to use DSP, to demonstrate information culture, communication skills in the performance of design work.	5	+		+						+		
24	Fundamentals of	Physical laws in astrophysics, interstellar	5	+	+	+								

	astrophysics	medium, internal structure of stars, state of matter in stars, energy sources of stars, evolution of stars, elements of galaxy, cosmology, limited problems of two bodies, three bodies, change of limited problems, problems of integration of equations of celestial mechanics, analytical methods of celestial mechanics, relativistic celestial mechanics are considered. Describes the rationale for the role of the subject in a particular life using ICT.												
25	Methods of teaching astronomy	Analyzing the needs of astronomical science, the features of the lesson of astronomy, the results of astronomical research, astronomy program are considered. The ways of integration of interdisciplinary knowledge with the use of cor for solving problems in high school with effective innovative methods, including the skills of solving astronomical problems, laboratory work are described.	5	+		+				+				
26	Basics of cosmology	Considers the main achievements of modern cosmology, unsolved problems, reflection of theoretical models, experimental methods used in modern astrophysics, General comparative theory, experiments to test stars, their evolution, galaxy, residual radiation, inflation period of the world expansion. In the implementation of the project work describes the communicative, demonstration of information culture, analysis of the problem, the rationale for the role and place of the subject in a particular life.	5	+	+								+	+
CYCLE majors university component / elective component														

27	Mechanics	Kinematics, dynamics of a material point, Newton's laws, laws of conservation of energy, momentum, AST, mechanics of a solid body, the world law of gravitation, hydrodynamics, oscillatory motion, waves, methods and techniques of solving problems with the use of basic mechanical laws, practical application, methods of laboratory research are considered. The comparative error made in laboratory work, argumentation of a role of discipline in science, ways of integration of subject knowledge are described.	5	+	+		+			+				
28	Methods of teaching physics	The scientific-methodical analysis of the sections "Mechanics", "Molecular physics", "Electricity and magnetism", "Optics", "Atomic and nuclear physics", basic physical concepts, laws, methods of generalization of lessons, features of methods of teaching physics at the profile level, the solution of typical problems, methods of application of knowledge in practice. Describes the way defining assessment criteria in the solution of problems, demonstrations, information culture, integration of multidisciplinary knowledge.	7						+			+		+
29	Workshop on solving physical problems	Methods of solving physical problems, design features of different types of physics problems, control works, types of Olympiad problems, ways of compiling problems and evaluation criteria and ways of their application in practice as didactic materials are considered. The ways of using DSP in solving problems, communicative performance of project works, information culture and integration of interdisciplinary knowledge are described.	12	+		+				+		+		
30	Technique of physical	The main problems of the school course of	5	+		+						+		

	experiment at school	physics are considered on an experimental basis: control of physical phenomena; measurement of physical quantities by measuring instruments, the appointment of quantitative dependencies between physical quantities, the definition of physical constants, methodical, technical task of demonstration experiments, technical devices. It describes the use of DSP, the organization of the educational process on the basis of ICT, communication in the implementation of project work, the provision of information culture												
31	Methods of scientific research and information letter	The purpose of studying the discipline "Methods of scientific research and academic writing" is to develop students ' skills of structural presentation of their own ideas, mastering the ways of working with various scientific and scientific information sources, taking into account the specifics of academic discourse. The discipline forms students ' writing culture, critical thinking skills, and linguistic and pragmatic competencies, improves written language culture through the language of which they are native speakers, and gives an idea of the principles and culture of academic integrity.	5			+						+	+	
CYCLE majors university component / elective component														
32	1. Scientific development of synergetics and physics 2. History of Physics	1. The analysis of scientific and technical progress of physics, qualitative changes in the productive forces, fundamental and applied research aimed at the creation of new technologies and improvement of existing technologies, the ways of their development. The substantiation of a role and a place of a	5		+		+							+

		subject in science, generalization of scientific forecasts of development of the personality of the trained, functional, creative use of knowledge in carrying out research works is described.												
		2. The stages of development of physics, the history of life and activity of scientists who contributed to the formation of physical theories are considered. In the process of studying physics describes the practical application of historical data, the rationale for the role and place of physics in science, the generalization of scientific forecasts of personal development of the student, functional, creative use of knowledge in research.			+		+							+