6B01514 - COMPUTER SCIENCE AND ROBOTICS

The purpose of the educational program: Training of competitive teaching staff with high social and civic responsibility, capable of performing professional activities in the field of computer science and robotics with the use of innovative technologies.

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

Relevance of the EP. The educational program was developed for the purpose of teaching informatics and robotics as training disciplines in educational institutions with the use of modern information and communication technologies. The program reveals the use of IT tools in the organization and planning of teaching informatics and roboticsinn the updated educational program in high school.

The modern world depends on information technology and its implementation in various spheres of activity. The availability of specialists capable of teaching these technologies to schoolchildren and students is essential to ensure our country's international competitiveness.

The growing interest in robotics in the world and the possibilities of its application in various branches of industry, science, medicine and other spheres of activity require specialists capable of working with robots and programming their work. Computer science and robotics teachers are perfectly capable of teaching robotics technology and contributing to the development of promising areas of science and technology.

EP 6B01514 - Computer Science and Robotics will be an important step in the development of education in the country. Even though information technology has been a part of people's lives for a long time, many schools still lack qualified specialists in this area of education. To justify the implementation of EP 6B01514 - Informatics and Robotics some arguments can be given:

1. Modern technology is entering all areas of people's lives, and school should be no exception. In today's world, knowing how to use computers is a necessary skill, and it has long since ceased to be specialized. It not only increases the level of education in

general but also gives students real knowledge that can become the basis for their future careers.

2. Robotics is a new industry that is emerging in Kazakhstan. In the near future, this industry can become one of the most promising in the economy of the country. However, in order for its development to be stable and safe, we need specialists who know the peculiarities of this direction.

4. The presence of specialists trained in computer science and robotics will be able to help students not only get objective information about the capabilities of different training programs but also to comment on them, giving advice on the advantages and disadvantages of each of them.

5. The implementation of EP 6B01514 - Informatics and Robotics can be a very useful step towards the progressive development of education in the country, improving educational programs and creating a favorable increase in the training of personnel in the field of information technology.

6. The educational program (EP) 6B01514 - Computer Science and Robotics will also help solve the problem of widespread "digital illiteracy". Knowledge of the basics of computer science and robotics will be a significant advantage for all students, regardless of the profession they choose in the future. Moreover, in today's world, the ability to work with computers and various programs, as well as knowledge of changing technologies, is already becoming a necessary component of human competence.

7. Kazakhstan needs highly qualified professionals in the field of information technology and robotics, capable of working with modern technologies and rapidly changing trends in this field. EP 6B01514 - Informatics and Robotics can be a starting point for future professionals involved in these fields.

8. Having professionals in this field will also help bring modern technology into the classroom at all levels. They will be able to create effective training programs that promote creativity, logical thinking, analytical abilities, and solving complex problems.

9. Students educated in this educational program will be able not only to teach computer science and robotics in schools, but also to work as experts in technology companies and scientific centers. Thus, it will also contribute to the development of scientific and innovative projects. In general, the implementation of EP 6B01514 - Informatics and Robotics will give a powerful impetus to the development of education and will help to prepare experienced professionals who will contribute to the development of the economy and society. In addition, it will help to reduce the qualification gap between different groups of the population, thereby positively affecting the development of the abilities of the country as a whole.

10. In addition, the implementation of EP 6B01514 - Computer Science and Robotics can attract new teachers to education. Many people with experience in the IT field may be interested in the opportunity to retrain and become teachers. Thus, it may also help increase the size of the teaching community as a whole.

11 EP 6B01514 - Computer Science and Robotics will also help develop national science programs in this area. Future teachers will be able to introduce their students to national advances in computer science and robotics and inspire them to explore further. This move will also improve Kazakhstan's competitiveness in the global labor market in information technology and robotics. Future graduates will be able to successfully compete in the labor market, not only in Kazakhstan but also abroad.

12. EP 6B01514- Informatics and Robotics will also help young people to get new professional knowledge, which will be useful for themselves and for the country as a whole. After all, informatics and robotics are fields that are in constant development, and it is the training of young people in new skills and knowledge that can help maintain the competitiveness of Kazakhstan.

13. EP 6B01514-Computer Science and Robotics can also be a powerful communicative tool to promote knowledge exchange between different cultures. Students will be able to teach students not only from their own country but also from other countries who will be interested in their knowledge and experience.

14. Future graduates of this EP will be able to become mentors for people who are already working in the field and help them develop their skills and professional knowledge.

As you can see, EP 6B01514- Computer Science and Robotics have quite a few benefits, not only for future teachers but for our country as a whole. This is not only a step towards improving the quality of education, but also towards scientific and technological development, which, in turn, will positively affect the future of Kazakhstan.

It should be noted that for the successful implementation of this EP, it is important to ensure appropriate conditions, including the highest quality educational programs, equipment, and qualified teachers. However, with all the necessary resources, EP 6B01514 - Informatics and Robotics can be an important step in the development of education and focus on modern technology in our country.

Market demand. The statistical portrait of Kazakhstan's computer science teacher in public schools according to the data published in the National collection Nur-Sultan for 2022 "Statistics of the education system of the Republic of Kazakhstan" (https://iac.kz/wp-content/uploads/2022/05/ns-2022.02.22. pdf) is presented by the following figures: total number of teachers of computer science in the country - 13020, including 94,7% have higher education, 0,55% have the category of teacher-master, 12,94% have the category of teacher-researcher, 20,50% have the category of teacher-expert, 22,85% have the category of teacher-expert, 29,89% have the category of teacher, 7,28% have the highest and first category.

According to the official website https://kz.trud.com in Kazakhstan, the largest number of vacancies in the profession of Computer Science Teacher opened in the Kostanay region, in second place - Atyrau region, and in third place - West Kazakhstan region, in fourth place - Zhambyl region (Diagram 1).

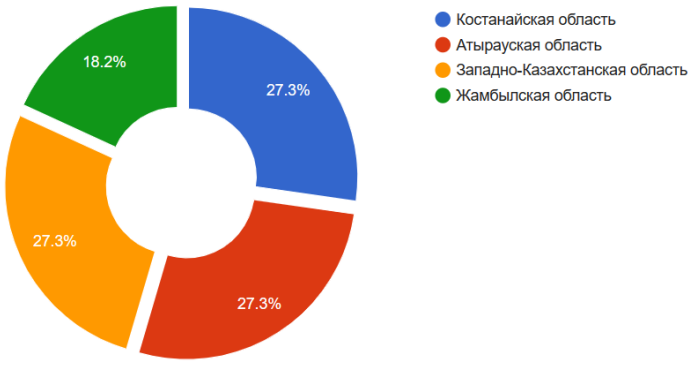

Diagram-1. Distribution of the vacancy Computer Science Teacher by regions of Kazakhstan.

1.4. DISTINCTIVE FEATURES OF THE EDUCATIONAL PROGRAM

Academic mobility	Aktobe State Regional University named after K.Zhubanov - Agreement No.1 Date 28.02.2018, South Kazakhstan State University named after M.O. Auezov - Agreement Date 04.10.2021, Pavlodar State Pedagogical University - Agreement Date 18.10.2017, Kyzylorda State University named

	after Korkyt ata - Agreement Date 2.03.2018, South Kazakhstan State Pedagogical University - Agreement Date 13.01.2023, Mississippi Valley State University (USA) - Agreement Date 12.11.2019, Western International College of London (UK) - Agreement Date 10.02.2023.
Double-degree program	Mississippi Valley State University (USA) - Memorandum Date 12.11.2019., Western International College of London (UK) - Memorandum Date 10.02.2023., Riga Technical University (Latvia) - Memorandum Date 02.09.2022

Coincidence with similar EP of leading universities in the near and far abroad
Oxford University - 40%, Western International College of London (UK) - 40%, Hong Kong University - 57%, Mississippi Valley State University (USA) - 52%.

1.5. GRADUATE CAREER OPPORTUNITIES

A graduate of the educational program “6B01514-Computer Science and Robotics” has the opportunity to find a job as a teacher of computer science and robotics in educational and scientific institutions, in institutions of additional education, specialized clubs, and educational centers.

1.6. AREAS OF PROFESSIONAL COMPETENCE

1. Professional Values. Performs his/her professional activities on the basis of respect and responsibility, honesty, and fairness. Understands pedagogical approaches to quality instruction based on knowledge of strategic educational documents, cultural values, and learning theory. Plans the educational process, organizes a safe, supportive environment for all students/educators, and ensures that learning and educational goals are met/
2. Professional Knowledge. Knows how to program, design and model professionally, use information protection tools, use heterogeneous information resources, diagnose and control hardware and software programs, design and program robots, and organize project work with students in the field of robotics.
3. Professional Development. Manages own professional growth and develops competencies for effective pedagogical activities.

1.7. EDUCATIONAL PROGRAM LEARNING OUTCOMES:

LO1 - Applies a variety of communication formats taking into account socio-cultural diversity, adheres to the principles of equality and accessibility in education, to create a prosperous and inclusive environment, has leadership qualities and is able to apply them to develop collective potential

LO2 - Possess high-level critical and creative thinking skills, are capable of self-regulation and reflection to solve professional problems

LO3 - Demonstrate knowledge of and adherence to ethical and legal norms in research and use of digital technologies. Apply security measures when working with digital information and data protection, and promote the active, safe, and ethical use of digital resources.

LO4 - Distinguishes types of assessment, uses content and methodological aspects of teaching computer science and robotics that promote critical thinking, and is able to manage the teaching and learning process.

LO5 - Applies physical and mathematical apparatus, computer science theory, computer modeling methods, and computational and experimental research methods in the course of professional activities.

LO6 - Applies high-level programming languages to create computer applications and software prototypes to solve applied problems.

LO7 - Uses networking resources and tools to develop networks and web-based applications in professional activities.

LO8 - Applies methods of processing and visualizing models of objects, processes and phenomena using specialized software.

LO9 - Creates algorithms to control virtual performers and artificial intelligence, and possesses technologies for construing and programming robot models in various development environments.

LO10 - Designs an information system according to the task at hand and provides data protection in computer systems and networks.

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
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) State compulsory standard of higher and postgraduate education, approved by Order No. 2 of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022. Registered in the Ministry of Justice of the Republic of Kazakhstan on July 27, 2022 № 28916.

2) Professional standard "Teacher" approved by order of the Acting Minister of Education of the Republic of Kazakhstan dated December 15, 2022, № 500. Registered in the Ministry of Justice of the Republic of Kazakhstan on December 19, 2022 № 31149.

3) Methodological recommendations on the organization and conduct of pedagogical practice for students in the field of education "pedagogical sciences. Order №125 dated March 27, 2023.