6B06101-Design of Digital Analytical Educational Systems

The purpose of the educational program: Training of specialists capable of designing and developing analytical systems in the field of education and information and communication technologies.

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

THE RATIONALE BEHIND THE EDUCATION PROGRAM

The Relevance of the EP. The bachelor's degree program in the educational program «6B06101-Design of digital analytical educational systems» is determined by the results of training, which are formed on the basis of Dublin descriptors and are expressed through the competence of General, methodological and subject training.

The educational program was developed taking into account the generalization of modern domestic and world experience of training in this field, author's and collective scientific achievements, and educational and methodical developments in the field of specialization, requirements of employers and demands of the labour market.

Bachelors master the latest software development technologies, learn to create professional websITE, and master the secrets of computer graphics. Students acquire knowledge and skills that allow them to perform mathematical modeling and analytical data processing, use applied and system programming tools, participate in the development of information systems, and administer software systems and networks used in the education system.

Market demand

Statistical analysis was performed on the basis of an official website "http://stat.gov.kz/official/industry/11/statistic/5" National collection "education Statistics of the Republic of Kazakhstan" published in 2018 JSC "Information-analytical centre", and the official response of the

regional directorates of education of Kazakhstan. According to the data, there are more than 800 educational institutions of technical and vocational education (hereinafter – TVE) in the Republic of Kazakhstan, including more than 450 public and more than 300 private. At the same time, more than 300 it specialists, students of higher and postgraduate education for 2013-2018 amounted to 808.4 thousand people, including 70 thousand people in it specialties, which is a percentage of 8.7%. specialists in support of VPS (virtual dedicated server), web programmers, designers.

The state educational order for the field of education "6B06 Information and Communication Technologies", funded from the republican budget, for the 2022 – 2023 academic year was-7199.

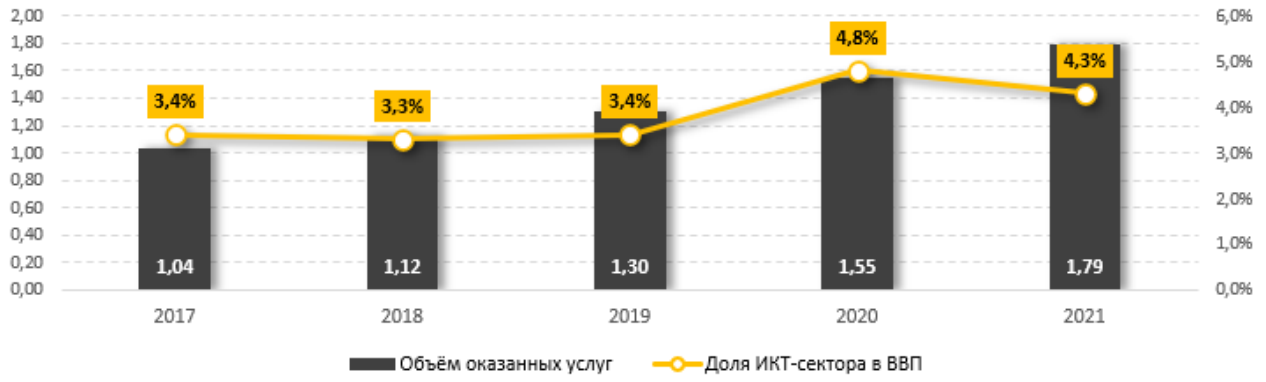
In the structure of the information technology market (hereinafter – IT) in Kazakhstan, the sector of IT equipment sales is dominant in the total volume, which is a reflection of the increased demand for computers, network and peripheral computer equipment that accompanies the process of Informatization of Kazakhstan's society.

In Kazakhstan, the number of jobs for IT professionals has increased by more than a third every year over the past two years. However, despite a sufficient number of applicants, the market still lacks supply. In search of experienced IT specialists, employers are willing to pay significantly more than employees in other industries, reports inbusiness.kz, based on Finprom information.

Favourable income dynamics of IT-specialists is based on the growing digitalization of the economic sector. The volume of the Kazakhstan market in the field of information and communication technologies (including the telecommunications sector) increased by 72% from 1 trillion tenge to 1.79 trillion tenge between 2017 and 2022. Of these, 515.1 trillion tenge went directly to computer programming services last year. This is almost three times more than in 2017 (183.9 billion tenge).

According to the Ministry of Digital Development, Innovation and Aerospace Industry of Kazakhstan, dozens of large technology companies, including Playrix, TinkoffBank and Nexters, have moved to Kazakhstan due to the geopolitical crisis. The total capitalization of the relocated companies exceeds $27 billion. The total capitalization of the relocated companies exceeded $27 billion.

Рынок информационно-коммуникационных технологий РК (трлн тг)



Объём оказанных ИКТ-услуг по укрупнённым группам (млрд тг)

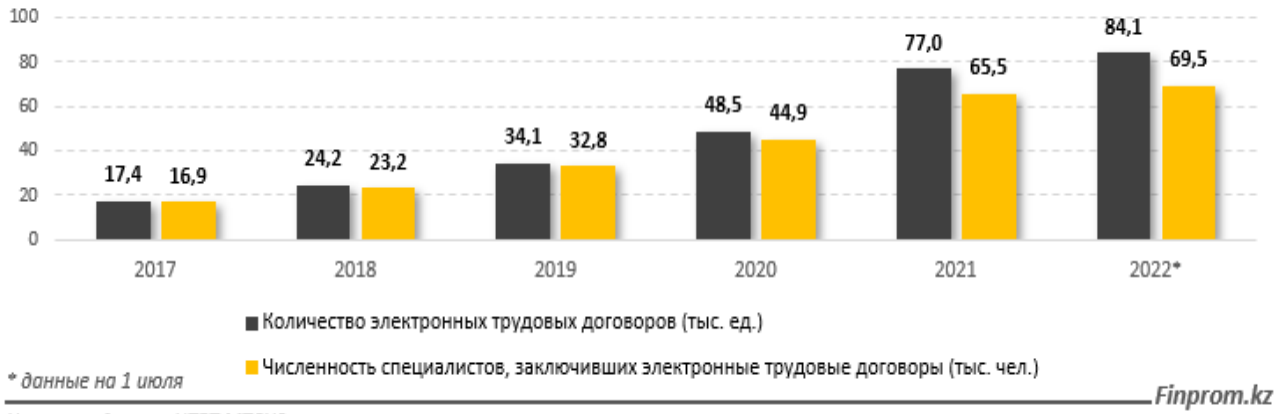
	2021	2017	Прирост
Услуги по изданию ПО	2,9	2,9	1,2%
Услуги по компьютерному программированию, услуги консультационные и аналогичные	515,1	183,9	180,1%
Услуги по обработке данных размещение приложений (прикладных программ) и связанная с этим деятельность, деятельность веб-порталов	189,7	79,4	138,8%
Услуги по ремонту компьютеров и оборудования связи	42,5	19,2	121,1%
Услуги связи	1 041,3	752,3	38,4%

На основе данных Бюро национальной статистики АСПиР РК **Finprom.kz**

According to the data of JSC, "Center for Development of Labor Resources" (subordinate organization of the Ministry of Labor and Social Security of the Republic of Kazakhstan), the labor market

of IT-specialists in Kazakhstan has 69.5 thousand employees. So many professionals are registered through the Unified System of Employment Contract Records. According to analysts, the Human Resources Development Center, the number of programmers and IT analysts may be more than 10%, because the obligatory registration of employment contracts in the Unified System of Labor Contracts in Kazakhstan is valid only from May 2021, Therefore, older treaties may not be included. Moreover, there is no data on the self-employed in the system.

IT-специалисты в Казахстане



На основе данных ЦТРТ МТСНЗ

Analysis of the data of the hh.kz platform shows that the number of vacancies of IT-specialists at this private recruiting site in the first half of 2022 increased by 41% per year, reaching 14 thousand, and at the end of January-June this year the growth amounted to another 36%, up to 19 thousand. vacant jobs. Half of them went to Almaty, 24% to Astana.

The need for personnel exceeds the supply by 6.1%. Considering the projected growth of the market and the current state of training of young specialists by institutions of higher and secondary vocational education. The Ministry of Labor has developed a vision of the future of the labor market of Kazakhstan, taking into account global challenges and emerging trends in the country.

The population is projected to increase to 19.8 million in 2025, or 1.6 million (9% compared to 2023). The workforce will increase by 6.7% to 9.8 million (9.0 million in 2023). Given the technological modernization of the economy, the need for human resources by 2025 will be more than 570,000. Medium- and high-skilled jobs are projected to increase by 766,000.

Official statistics confirm that the income of programmers in Kazakhstan is growing at a high rate.

The average monthly nominal salary in the IT sector in the third quarter of this year, compared to the same period in 2022, increased by 28.9%, from 433.4 thousand to 558.7 thousand tenge.

Среднемесячная номинальная заработная плата. Компьютерное программирование, консультационные и иные услуги (тыс. тг)

На основе данных Бюро национальной статистики АСПиР

DISTINCTIVE FEATURES OF THE EDUCATIONAL PROGRAM

Academic mobility	In 2022, a cooperation agreement was signed with the NAO "Karaganda University named after Academician E.A.Buketov", on 08/01/2022, a cooperation agreement was signed with JSC "International University of Information Technologies", Mississippi Valley State University (USA) dated 08.04.2014, Western International College of London (UK) dated 10.05.2018, Institute of Applied Sciences, Latvia-No. 6-2. 4.1/04. 2022, 3.09.2022
Dual degree program	Mississippi Valley State University (USA) dated 08.04.2014, Western International College of London (UK) dated 10.05.2018, Institute of Applied Sciences, Latvia-No. 6-2. 4.1/04. 2022, 3.09.2022
Supplementary Education (Minor)	According to the educational program "6B06101-Design of digital analytical educational systems", additional education is considered: ***Designer of children's robotics*** – a specialist who develops children's toys, games, gadgets and various mechanized consumer goods based on programmable robots, taking into account the psychophysiological characteristics of children

Coincidence with Similar Results of Leading Universities of Neighbouring and Distant Countries.

UCL (University College London) - 37%, The University of Hong Kong - 57%, c Massachusetts Institute of Technology - 50%., Riga Technical University – 30%.

GRADUATE CAREER OPPORTUNITIES

A graduate of the educational program "6B06101-Design of digital analytical educational systems" has the opportunity to find a job as a designer and developer of information and software systems, a programmer in educational and scientific institutions, a database administrator, a designer of computer programs, an information security specialist

AREAS OF PROFESSIONAL COMPETENCE

The Bachelor of Information and Communication Technology on the educational program 6B06101-Design of Digital Analytical Educational Systems can perform the following types of professional activities:

1. **Scientific and technical:** *systematically study scientific and technical information, as well as holistic experience, find solutions to the problems under study with the compilation of models and algorithms, simulate technological processes using computer programs and computer-aided design tools, work on new innovative projects and implement the results of scientific research.*
2. **Expert-analytical:** *collects processes and analyzes information. WrITE queries to databases, identifies trends, checks hypotheses, and conducts tests and, based on the results, draws certain conclusions that help solve a particular problem.*
3. **Information and communication:** *can share tasks in teamwork, is able to present himself and the results of his work in a professional environment.*

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, promote the active, safe and ethical use of digital resources.

LO 4 – Uses artificial intelligence approaches, methods of analysis and processing of big data to solve professional tasks in the specialty.

LO 5 – design web applications and educational systems with ergonomic user interface based on flexible methodology and principles of network security.

LO 6 – design and analyse software using modern algorithmic and mathematical methods.

LO 7 – develop digital analytical educational systems using modern methods of system and visual programming

LO 8 – manage IT projects, computer and information systems in the process of professional activity, apply methods of information data protection.

LO 9 – use digital literacy and interdisciplinary knowledge in solving professional problems and determine cause-and-effect relationships of natural-scientific processes and phenomena.

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	LO 12
GA1		+	+	+	+	+	+	+	+			
GA 2	+		+									
GA 3	+	+		+		+			+			
GA 4	+	+	+									
GA 5	+		+		+				+			
GA 6		+		+	+	+	+	+	+			

REFERENCES

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

1) Professional standard «Management and Design of Computer Hardware and Embedded Systems» approved by the order of the Chairman of the Board of the National Chamber of entrepreneurs of the Republic of Kazakhstan «Atameken» No. 259 dated December 24, 2019.

2) SQF information, Informatization, communications and telecommunications, approved by the minutes of the meeting of the Industry Commission in the field of information, Informatization, communications and telecommunications dated December 20, 2016 No. 1.

3) Professional standard « Creation and management of information resources » approved by the order of the Chairman of the Board of the National Chamber of entrepreneurs of the Republic of Kazakhstan «Atameken» dated January 1, 2016.

4) Professional standard « Business analysis in information and communication technologies» approved by the order of the Chairman of the Board of the National Chamber of entrepreneurs of the Republic of Kazakhstan «Atameken» dated January 1, 2016.