ADDITIONAL (MINOR) EDUCATION PROGRAM
«DESIGNER OF CHILDREN'S ROBOTICS»

The educational program includes an additional educational program Designer of children's robotics (Minor).

The fourth technological revolution is currently taking place in the world: the rapid flow of information, high-tech innovations and developments are changing all areas of our life, changing the needs of society and the interests of the individual. Robotics, construction, programming, modeling, 3D design, and much more are now of interest to modern schoolchildren around the world. More complex skills and competencies are needed to realize these interests. Thanks to the rapid development of technologies, new professions are emerging, and the demand for specialists in the design of children's robotics and the professions of tomorrow is growing massively.

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

EXPECTED RESULTS:
Student who completed this program:
- Knows the main mechanical, electronic and computer components of robotic systems;
- Can design and program robots with Lego Mindstorms complexes;
- Can create an environment (scene) and program robots in V-REP;
- Can coordinate consistency, visibility, interactivity, and intersubject connections when designing and programming robots in Lego Mindstorms and V-REP;
- Constructs programmable robots, games for children.

PROGRAM BENEFITS:
The student has the opportunity to learn and develop professional skills for the development of new competency, image building specialist.

PROGRAM DESCRIPTION: the
Department of computer Science and applied mathematics provides an Additional educational program "Designing children's robotics" (Minor).
- This program is an elective course for all students, both within the academic program and for an additional fee.
- The number of credits for obtaining a bachelor's degree remains unchanged-240 credits.
- Students must earn 15 credits. Each course consists of 5 credits

REQUIREMENTS FOR ADMISSION TO THE COURSE:
- The program is available to all students of Kazakh national women's pedagogical University;
- First-year students are provided with an introductory course;
- Students must choose at least two courses from the list of required subjects;
- Students will be required to select at least three courses from the list of elective subjects;
- Master's students can also choose this program, but none of these courses are considered part of their academic program

The additional educational program "Designer of children's robotics" requires the following knowledge and skills from the student:
- skills in working with a computer as an information management tool;
- work with information in global computer networks.

PROGRAMME CONTENT:

Name of the discipline	ECTS	Language of instruction
Selection components		
Design of robots and robotic systems	5	Kazakh / Russian
Multimedia technologies	5	Kazakh / Russian
Software for mechatronic and robotic systems	5	Kazakh / Russian

Name of the discipline: Design of robots and robotic systems
ECTS: 5
Brief description of the discipline: the discipline is aimed at training bachelors to design activities in the field of creation and implementation of hardware and software mechatronics and robotics in accordance with the terms of reference and using automation design, design and technological activities in the field of creation of tools and systems of mechatronics and robotics using modern tools and information technology.
Content of the discipline: Details of educational robots and their design. Robotic platform. Types of mobile platforms. Crawler drive. Wheel drive. Hybrid drive. Classification of platforms by management type. Components of a robotic platform. Technologies for creating the platform. Example of building a robotic platform. Select the platform type. Body. Sensors. Engines. The scheme of interaction of elements

Name of the discipline: Multimedia technologies
ECTS: 5
Brief description of the discipline: History of multimedia development. Basic concepts of multimedia. Multimedia technology. Types of multimedia information data and means of their processing. Application. Classes of multimedia systems. Components of multimedia. Text. Animation. Video. Sound. Stages and technology of creating multimedia products. The technology of processing graphic information. Modern graphic accelerators. Video conferencing and multi-screen systems.
Content of the discipline: Modern multimedia tools. The Program Macromedia Flash. Classes of multimedia systems. Multimedia components. Stages and technology of creating multimedia products. Technology for processing graphic information. Modern graphics accelerators. Video conferences and multi-screen systems. Indicator systems used in Windows and other systems, the basis for creating multimedia projects, CD-ROM device management, Windows Media, Macromedia Flash, Microsoft Windows Media player

Name of the discipline: Software for mechatronic and robotic systems
ECTS: 5
Brief description of the discipline: Basic principles and methodology of development of application software for mechatronic and robotic systems based on algorithmic programming languages of different levels. Data structures used to represent mechatronic and robotic systems. Programming languages of robots. Their classification. Cross-platform applications, features of implementation and application. Object-oriented programming approach in the development of SOFTWARE for control of mechatronic and robotic systems. Advantages and disadvantages.
Content of the discipline: Software and hardware for creating mechatronic and robotic systems. Working software documentation for components of a prototype mechatronic or robotic system. Drawing up a measurement and test plan for various measurement and experimental tasks in mechatronics and robotics.