

## Programme Description

- **Name of the programme: STEAM-practices in Education**
- **Number of ECTS credits for the programme: 120**
- **Aim/purpose with the programme:** training of a teacher-researcher and a teacher-practitioner who is able to create modern safe digital educational environment to stimulate students' creative interest in the study of sciences and develop their creative abilities, as well as provide the necessary pedagogical conditions for organizing and implementing STEAM-education
- **Learning outcomes for the programme**

<i>Nº</i>	<i>Learning outcome</i>	Indicators
1.	<i>Able to carry out a critical analysis of problem situations based on a systematic approach, develop an action strategy</i>	<p>Able to identify the problem situation in the process of analyzing the problem, determine the stages of its solution, taking into account variable contexts</p> <p>Able to find, critically analyze and select the information necessary to develop an action strategy to solve a problem situation</p> <p>Able to consider various options for solving a problem situation based on a systematic approach, evaluate their advantages and risks</p> <p>Able to competently, logically, reasonably formulate his own judgments and estimates; offer an action strategy</p> <p>Able to define and evaluate the practical consequences of implementing actions aimed at solving a problem situation</p>
2	<i>Able to manage a project at all stages of its life cycle</i>	<p>Able to build the stages of work on the project taking into account the sequence of their implementation, determine the stages of the project life cycle</p> <p>Able to identify the problem that the project is aimed at, correctly formulate the goal of the project; define the project executors.</p> <p>Able to design the solution of specific tasks of the project, choosing the best way to solve them, based on existing legal norms and available resources and restrictions.</p> <p>Able to solve specific problems (research, project, activity) qualitatively within a specified time; assess the risks and results of the project</p> <p>Able to present the results of the project publicly at a high quality level, join a discussion of the progress and results of the project</p>
3	<i>Able to organize and manage the team work, develop a</i>	<p>Able to understand the effectiveness of using a cooperation strategy to achieve the goal, determine the role of each participant in the team</p>

	<i>team strategy to achieve the set goal</i>	<p>Able to take into account the characteristics of the behavior and communication skills of different people in joint activities.</p> <p>Able to establish different types of communication (oral, written, verbal, non-verbal, real, virtual, interpersonal, etc.) to lead the team and achieve the goal</p> <p>Able to demonstrate understanding of the results (consequences) of personal actions and plans a sequence of steps to achieve the goal, control their implementation</p> <p>Able to effectively interact with team members, participates in the exchange of information, knowledge and experience, and the presentation of the results of the team; comply with ethical standards of interaction</p>
4	<i>Able to apply modern communication technologies, including those in a foreign language(s), for academic and professional interaction</i>	<p>Able to choose communicatively acceptable styles of business communication, verbal and non-verbal means of interaction with partners in the national and foreign languages.</p> <p>Able to use ICT to search for the necessary information in the process of solving various communicative tasks in the national and foreign languages.</p> <p>Able to conduct business correspondence in the national and foreign languages, taking into account the stylistics of official and personal letters, sociocultural differences in the format of correspondence.</p> <p>Able to communicate verbally and culturally in an oral business conversation in the process of professional interaction in the national and foreign languages.</p> <p>Able to demonstrate the ability to translate academic and professional texts from a foreign language (s) into the national language.</p>
5	<i>Able to analyze and take into account the diversity of cultures in the process of intercultural interaction</i>	<p>Able to find and use information on cultural characteristics and traditions of various communities which is necessary for self-development and interaction with others.</p> <p>Able to demonstrate a respectful attitude to the historical heritage and sociocultural traditions of various peoples, based on knowledge of the stages of historical development of society and cultural traditions of the world, depending on the interaction environment and educational objectives.</p> <p>Able to tolerantly and constructively interact with people, taking into account their sociocultural characteristics, in order to successfully complete professional tasks and strengthen social integration</p>
6	<i>Able to determine and implement the priorities of their own activities and ways to improve them on the basis of self-esteem</i>	<p>Able to use reflective methods in the process of evaluating a variety of resources (personal, psychophysiological, situational, temporary, etc.) used to solve the problems of self-organization and self-development.</p> <p>Able to determine the priorities of their own activities, build plans for their achievement.</p> <p>Able to formulate the goals of their own activities, determine the ways to achieve them, taking into account resources,</p>

		conditions, means, time prospects for the development of activities and planned results.
		Able to critically evaluate the efficiency of using time and other resources to improve their activities
		Able to demonstrate interest in learning and use the opportunities provided to acquire new knowledge and skills in order to improve their activities.
7	<i>Able to carry out and optimize professional activities in accordance with regulatory legal acts in the field of education and standards of professional ethics</i>	Able to demonstrate comprehensive knowledge of priority directions of development of the education system of the Russian Federation,
		Able to demonstrate comprehensive understanding of laws and other regulatory legal acts regulating activities in the field of education
		Able to apply the basic regulatory acts in the field of education, taking into account the norms of professional ethics
		Able to implement actions (skills) which comply with legal, moral and ethical standards, the requirements of professional ethics in real pedagogical situations
		Able to carry out professional activities in accordance with the requirements of federal state educational standards at all levels of education
8	<i>Able to design basic and extra-curricular educational programs and develop methodological support for their implementation</i>	Able to demonstrate comprehensive knowledge of the content of the main regulatory documents necessary for the design of the Educational program
		Able to demonstrate comprehensive understanding of the essence and methods of pedagogical diagnostics of students' features
		Able to demonstrate comprehensive understanding of the essence of pedagogical design, structure of the educational program and requirements for it, types and functions of scientific and methodological support of the modern educational process.
		When designing an Educational program (EP) able to take into account the various contexts in which the processes of training, education and socialization occur
		Able to use methods of pedagogical diagnostics
		Able to carry out project activities for the development of EP
		Able to design individual structural components of the EP
9	<i>Able to design the organization of joint and individual activities of students, including those with special educational needs</i>	Able to demonstrate comprehensive knowledge of basic techniques and typology of technologies for individualization of education.
		Able to demonstrate comprehensive knowledge of the use of educational technologies (including those implied in an inclusive educational process), necessary for targeted work with various categories of students, including with special educational needs
		Able to provide targeted assistance to students at different levels of education.

		Able to interact with other specialists in the implementation of the educational process
		Able to correlate types of targeted assistance with the individual educational needs of students at different levels of education
<i>Able to create and implement the conditions and principles of spiritual and moral education of students on the basis of basic national values</i>		Able to demonstrate comprehensive understanding of general principles and approaches to the implementation of the educational process
		Able to demonstrate comprehensive knowledge of methods and techniques for the formation of value orientations of students, the development of moral feelings, moral character, moral position, moral behavior
		Able to demonstrate comprehensive knowledge of documents regulating the content of basic national values
		Able to create pedagogical situations that promote the formation of students' moral position, spirituality, value attitude to people.
		Able to apply modern psychological and pedagogical methods of creating the conditions and principles of spiritual and moral education of students on the basis of basic national values
<i>Able to develop programs for monitoring students' learning outcomes, to develop and implement programs to overcome learning difficulties</i>		Able to demonstrate comprehensive knowledge of the principles of control and evaluation of educational results of students
		Able to demonstrate comprehensive knowledge of the principles of establishing monitoring programs
		Able to demonstrate comprehensive knowledge of special technologies and methods of developing and implementing programs to overcome learning difficulties
		Able to apply tools and methods of diagnosis and assessment of the level and dynamics of development of students
		Able to conduct pedagogical diagnostics of learning difficulties
		Able to monitor and evaluate the educational results of students
<i>Able to design and use effective psychological and pedagogical technologies, including inclusive ones, in professional activities necessary for the individualization of training, development and education of students with special educational needs</i>		Able to demonstrate comprehensive knowledge of psychological and pedagogical foundations of educational activities of students
		Able to demonstrate comprehensive knowledge of principles of design and the use of psychological and pedagogical (including inclusive) technologies in teaching, taking into account personal and age characteristics of students, including those with special educational needs
		Able to plan educational activities taking into account individual features of students;
		Able to select and apply psychological and pedagogical (including inclusive) to individualize training, development,

		education of students, including those with special educational needs
		Able to develop and implement individual educational routes, individually-oriented educational program.
<i>Able to plan and organize the interaction of participants of educational process</i>		Able to demonstrate comprehensive knowledge of pedagogical foundations for interaction with subjects of the educational process;
		Able to demonstrate comprehensive knowledge of methods for identifying individual characteristics of students;
		Able to demonstrate comprehensive knowledge of features of interaction with various participants of the educational process, taking into account the characteristics of the educational environment of the institution
		Able to use the features of the educational environment of the institution to implement the interaction of subjects of an educational process
		Able to draw up (together with other specialists) interaction plans for participants of an educational process
		Able to implement technologies of interaction and cooperation in the educational process to solve problems on the basis of individual approach
<i>Able to design teaching activities based on special scientific knowledge and research results</i>		Able to demonstrate comprehensive knowledge of features of teaching process and requirements for participants of educational process
		Able to demonstrate comprehensive knowledge of results of scientific research in teaching
		Able to use modern special scientific knowledge and research results to select methods in education including STEM education
		Able to make a choice of methods, forms and means of teaching depending on the context of professional activity, taking into account the results of scientific research.
<i>Able to organize students' activities to achieve mastery of an extra-curricular educational program</i>		Able to demonstrate comprehensive knowledge and understanding of STEAM education
		Able to demonstrate comprehensive knowledge of the theoretical foundations and technologies of organization (including stimulation and motivation) of students' communication and activities aimed at achieving learning outcomes of an extra-curricular STEAM educational program
		Able to design a pedagogical environment focusing on phenomenon-based learning
		Able to develop design and research projects taking into account regulatory requirements
		Able to organize hands-on inquiry and open-ended exploration
		Able to consult students at all stages of preparation and execution of design, research, scientific projects
<i>Able to implement pedagogical control and</i>		Able to demonstrate comprehensive knowledge of the technologies and methods of organizing control and

<i>assessment of learning outcomes of an extra-curricular educational program</i>	assessing learning outcomes of an extra-curricular STEAM educational program, taking into account the identified difficulties.
	Able to design and apply reasonable criteria for monitoring and assessing learning outcomes of an extra-curricular STEAM educational program, taking into account the identified difficulties in learning;
	Able to analyze and interpret the results of pedagogical control and assessment
	Able to assess students' exploration results including multi-disciplinarian ones
<i>Able to develop methodological tools for implementation of an extra-curricular educational program</i>	Able to demonstrate comprehensive knowledge of the requirements and approaches to designing and creating methodological support for the implementation of an of an extra-curricular STEAM educational program
	Able to function on multi-disciplinary teams
	Able to identify, formulate, and solve multi-disciplinary problems
	Able to demonstrate applied problem-solving abilities to conduct STEM investigations
	Able to determine pedagogical goals and objectives of extra-curricular STEAM educational programs
	Able to design a STEM curriculum
	Able to plan classes aimed at mastering the chosen type of activity (in the field of extra-curricular STEM activities)
	Able to develop learning outcomes of extra-curricular STEAM programs
<i>Able to plan and conduct applied research in the field of science and education.</i>	Able to demonstrate comprehensive knowledge of modern technologies for collecting, processing and interpreting data for scientific research in the field of science and education
	Able to justify their position when choosing methods and technologies for conducting scientific research in the field of science and education
	Able to organize the collection of professionally important information, data processing and interpretation for scientific research in the field of science and education.
<i>Able to analyze the results of scientific research, apply them to solve specific research problems in the field of science and education</i>	Able to demonstrate comprehensive knowledge of the current trends of modern scientific pedagogical and psychological research
	Able to determine the methodological foundations of their research, select methods for conducting research.
	Able to analyze their professional research activities in order to optimize it.

- **Content of the programme**

## **Module 1: Current Issues in Science and Education**

History and philosophy of science and education

Innovative processes in education

## **Module 2 Theoretical and practical aspects of modern education**

Pedagogy and Psychology of professional Education

Professional foreign language terminology with a workshop

Educational law

Methodology and research methods with a workshop

## **Module 3. Educational Engineering**

Psychological and pedagogical interaction in the digital educational environment

Pedagogical design

Didactic engineering

## **Module 4: Methodological**

Methodology and technology of STEAM education with a workshop

Transfer of extra-curricular education technologies

Art education in a modern context

Design-Thinking

## **Optional disciplines**

### **Option 1**

Implementation of design projects in education

Ecosystem of project

### **Option 2**

Educational robotics

Computer graphics and methods of dynamic visualization in the educational process

## **Block 2 Practice (46 ESCT credits)**

### **Electives**

Implementation of students' Start Ups in scientific-technological park "Fabrica"

Pedagogical qualimetry

Game Management in Education

- **Educational profiles (if available)**
- **Teaching and working methods:**
  - E-learning opportunities;

- participation in design workshops under the supervision of experienced mentors;
  - lectures, trainings and master classes;
  - individual educational tracks, internships;
  - “production laboratory”;
  - public presentation of learning outcomes, protection of projects in the TED format
  - professional identity training
- **Entry requirements**  
Bachelor degree  
Individual achievements are desirable (scientific articles, participation in conferences, etc.)  
Entrance tests: a foreign language test, a comprehensive test on pedagogy and psychology, innovative technologies in education and ICT
  - **Degree thesis**  
Master degree