BSPU
Belorussian State Pedagogical University

Mathematics and IT

The notes about the aim and learning outcomes

1. Learning outcomes should be listed according to Dublin Descriptors and should be written using infinitive: at first **K – knowledge,** then **P – professional skills, R – research skills, S – social skills.** Now they are mixed. Use the order that is shown below:

After completing this study programme the students will be able to:

1. Apply basic scientific and theoretical knowledge to solve practical problems. **K**
2. Develop data structures for use in information systems, operational analysis systems and intellectual systems. **P**
3. Perform modeling, design of software tools and documentation to support activities in various subject areas. **P**
4. Perform comprehensive testing of the developed software products and applied software. **P**
5. Plan and organize automated support of various activities. **P**
6. Build and optimize models of various systems and processes. **P**
7. Analyze perspectives and directions of development of information systems and technologies. **R**
8. Work independently and in a team. **S**
9. Generate new ideas focusing on creativity, critical thinking, communication and collaboration. **S**

Table 1. Updated learning outcomes and Mathematics and IT study program

Subjects	**Study program learning outcomes**								
	1	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***
The series of socio-humanitarian disciplines									
State component									
Integrated module “History”								*x*	*x*
Philosophy	*x*							*x*	*x*
Integrated module “Economics”	*x*		*x*			*x*		*x*	*x*
Integrated module “Politology”								*x*	*x*
Component of higher education institution									
Law in IT sphere/ Intellectual Property and Information Protection	*x*							*x*	*x*
The series of general scientific and general professional disciplines									
State component									
Pedagogy	*x*							*x*	*x*
Psychology	*x*		*x*					*x*	*x*
Information technology in education	*x*		*x*	*x*	*x*	*x*	*x*	*x*	*x*
Foreign language [5]		*x*						*x*	
Safety of human vital activity	*x*							*x*	
Belarusian language (professional)	*x*	*x*	*x*					*x*	
Component of higher education institution									
Introduction to the pedagogical profession								*x*	

Team building								*x*	*x*
Age-specific physiology and school hygiene								*x*	
Distance learning technologies	*x*					*x*		*x*	*x*
Physics	*x*	*x*	*x*			*x*	*x*		
Astronomy	*x*	*x*	*x*			*x*	*x*		
State component									
Mathematical logic and discrete mathematics		*x*							*x*
Analytical geometry and plane transformations	*x*					*x*			
Methods of figures images and fundamentals of geometry	*x*					*x*			
Algebra	*x*		*x*			*x*			
Number theory	*x*	*x*							
Mathematical analysis	*x*	*x*							
Differential equations	*x*	*x*	*x*						
Methods of teaching mathematics							*x*	*x*	*x*
Programming technologies and algorithms	*x*	*x*	*x*	*x*	*x*	*x*	*x*		
Computer graphics and multimedia[6]	*x*	*x*	*x*	*x*	*x*	*x*	*x*		
Information systems and networks[7]	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*	
Methods of teaching informatics	*x*		*x*	*x*	*x*	*x*	*x*	*x*	*x*
Course work[2]	*x*		*x*						
Course work[3]	*x*		*x*						
Component of higher education institution									
Introduction to mathematics	*x*	*x*							
Differential geometry	*x*		*x*						
Function theory	*x*		*x*			*x*			
Elementary mathematics and practical work on solving problems	*x*		*x*						
Computer networks	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*	
Workshop on solving problems in informatics	*x*	*x*	*x*	*x*	*x*	*x*	*x*		*x*
Integrated course of school mathematics	*x*	*x*	*x*						
Workshop on methods of teaching mathematics	*x*	*x*	*x*	*x*	*x*				
Computational methods and computer modeling	*x*	*x*	*x*	*x*	*x*	*x*	*x*		*x*
Theory of probabilities and mathematical statistics	*x*	*x*	*x*		*x*	*x*	*x*		
Disciplines for student choice[4]									
Entertaining and Olympiad mathematical problems / Functional analysis / Solving complex and Olympiad problems in programming	*x*	*x*	*x*	*x*	*x*				
Modern approaches to teaching students in mathematics / Formation of students' research skills in solving problems with parameters	*x*				*x*			*x*	
Management of IT projects / Technologies of network pedagogical interaction	*x*		*x*					*x*	*x*
Additional types of training									
Psychology of information perception	*x*							*x*	*x*
Physical Culture								*x*	*x*

Table 2. Correlation between IT Profile and the educational standard approved by the Ministry of Education of the Republic of Belarus

IT Profile	Belarusian standard
1. Apply basic scientific and theoretical knowledge to solve practical problems.	AC-1. Be able to apply basic scientific and theoretical knowledge to solve theoretical and practical problems

	AC-7. Have skills related to the use of technical devices, information management and work with a computer.
2. Develop data structures for use in information systems, operational analysis systems and intellectual systems.	AC-2. Possess a system and comparative analysis.
	AC-7. Have skills related to the use of technical devices, information management and work with a computer.
3. Perform modeling, design of software tools and documentation to support activities in various subject areas.	AC-6. Have an interdisciplinary approach to problem solving.
	AC-10. To be able to carry out educational and research activities.
4. Perform comprehensive testing of the developed software products and applied software.	AC-2. Possess a system and comparative analysis.
	AC-4. To be able to work independently.
	PCS-15. Develop educational opportunities of students on the basis of systematic pedagogical diagnostics.
5. Plan and organize automated support of various activities.	AC-1. Be able to apply basic scientific and theoretical knowledge to solve theoretical and practical problems.
	AC-2. Possess a system and comparative analysis.
	AC-6. Have an interdisciplinary approach to problem solving.
	SPC-3. Have the ability to interpersonal communication.
6. Build and optimize models of various systems and processes.	AC-6. Have an interdisciplinary approach to problem solving.
	AC-11. Be able to regulate educational relations and interactions in the pedagogical process.
	PCS-1. Effectively implement educational activities.
	PCS-3. Use the optimal methods, forms, teaching tools.
7. Analyze perspectives and directions of development of information systems and technologies.	AC-6. Have an interdisciplinary approach to problem solving.
	PCS-23. Organize a holistic pedagogical process taking into account modern educational technologies and pedagogical innovations.
8. Work independently and in a team.	AC-5. Be able to generate new ideas (have creativity).
	SPC-6. To be able to work in a team.
	SPC -7. Be capable of self-education and self-improvement of professional activities.

9. Generate new ideas focusing on creativity, critical thinking, communication and collaboration.	AC-5. Be able to generate new ideas (have creativity).
	AC-11. Be able to regulate educational relations and interactions in the pedagogical process.
	SPC-2. Be skilled in social interaction.
	SPC-3. Be able to effect interpersonal communication.
	SPC-8. Be able to implement valuable and oriented activities.
	PCS-4. Carry out the optimal selection and effectively implement the technology of education.
	PCS-22. To carry out self-education and self-improvement of professional activity.

The notes about study plan

No	**Courses EN**	**BSPU need to integrate during the project, ECTS**	**Course title in study plan**	**ECTS**	Notes
1	Law in the IT-sphere / Право в IT сфере	**3**	Law in IT sphere/	3	It's clear for us
2	Intellectual Property and Protection of Information / Интеллектуальная собственность и защита информации	**3**	Intellectual Property and Information Protection	3	It's clear for us
3	Psychology of Information Perception / Психология восприятия информации	**3**	Psychology of information perception	3	It's clear for us
4	Management of IT Projects / Управление ИТ проектами	**3**	Management of IT projects / Technologies of network pedagogical interaction	3	It's clear for us
5	Multimedia Creation and Processing Technologies / технологии создания и обработки мультимедиа	**6**	Computer graphics and multimedia[6]	6	It's clear for us
6	Computer Networks / Компьютерные сети	**3**	Computer networks	3	It's clear for us
7	Web Technologies / веб - технологии	**3**	Information systems and networks[7]	6	It's clear for us
8	English for Specific Purposes / Профессиональный английский	**8**	Foreign language[5]	11	It's clear for us
9	Team-building / Командообразование	**6**	Team building	6	It's clear for us
10	IT-technologies in Education / ИТ - технологии в образовании	**5**	Information technology in education	5	It's clear for us
11	Technology of Distance Learning / Технологии дистанционного образования	**4**	Distance learning technologies	4	It's clear for us
12	Technology of Pedagogical Interaction Network/ технологии педагогического взаимодействия	**3**	Technologies of network pedagogical interaction	3	It's clear for us
	ECTS	50		56	

[5] As a supplement and change to the curriculum for the academic discipline "Foreign Language", the section "Professional English" is included.

[6]As a supplement and change to the curriculum for the academic discipline "Computer Graphics and Multimedia," the section "Technologies for creating and processing multimedia" is included.
[7] As a supplement and change to the curriculum for the academic discipline "Information Systems and Networks" a section "Web Technologies" is included.