



Andrei D. Karol

Registration number

BELARUSIAN STATE UNIVERSITY

Контрольный экземпляр

157

## CURRICULUM

Speciality: 7-06-0532-03 Land Management, Cadastres, Geodesy and Geomatics  
Profiling: Geodata management using intelligent systems

Degree: Master of Science  
Period of study: 1 year  
Full-time form of education

## I. Schedule of the educational process

## II. Summary (in weeks)

[illegible]

Legend:

	— Academic Studies
:	— Exams

X	— Internship
/	— Research

//	— Master's Thesis
=	— Vacation

### III. Curriculum

№	The name of the module, academic discipline, course project (course work)	Exams	End-of-term test	Academic hours						Semesters						Competence Code
				Total	Total in class	As follows:				I course						
						Lectures	Laboratory work	Workshops	Seminar classes	1 semester, 17 weeks			2 semester, 11 weeks			
										Total	Total in class	Credits	Total	Total in class	Credits	
1	State Component			576	216	76	116	24		286	96	9	290	120	9	
1.1	Module «Special disciplines»															
1.1.1	Law support for land management and cadastres	1		92	48	16	32			92	48	3				DPC-1
1.1.2	Methodology and modern problems of geomatics	2		100	72	36	36						100	72	3	DPC-2
1.2	Module «Research work»															UC-1-2
1.2.1	Research Seminar		1,2	198						98		3	100		3	
1.3	Module «Modern information and educational technologies»															
1.3.1	Information technologies in professional activities		1	96	48		48			96	48	3				UC-3
1.3.2	Modern educational technologies		2	90	48	24		24					90	48	3	UC-4
2	Higher Education Institution Component			946	480	186	222	72		666	336	21	280	144	9	
2.1	Module «Programming and neural networks»															
2.1.1	Neural network technologies for pattern recognition / Systems for intelligent geodata processing	1		90	48	20	28			90	48	3				SC-1
2.1.2	Programming in a geographic information environment	2	1	180	96	44	52			90	48	3	90	48	3	SC-2
2.1.3	Automatic image analysis		1	108	48	20	28			108	48	3				SC-3
2.2	Module «Geoinformation analysis of geodata»															
2.2.1	GIS software functionality / Technologies for automated geodata processing		1	96	56	16		40		96	56	3				SC-4
2.2.2	Simulation and predictive data modeling in GIS		1	96	48	16		32		96	48	3				SC-5
2.2.3	Drone and digital laser scanning technologies	1		96	48	16	32			96	48	3				SC-6
2.2.4	GIS for land resource management		2d	100	48	14	34						100	48	3	SC-7
2.3	Module «Remote sensing and navigation technologies»															
2.3.1	Satellite systems and positioning technologies	1		90	40	20	20			90	40	3				SC-8
2.3.2	Methods and algorithms for processing of remote sensing data		2d	90	48	20	28						90	48	3	SC-9
2.4	Optional Subjects			1332	1280		1280			1216	1140	16	1216	1140	16	
2.4.1	Russian as a Foreign Language*	1/2	1/1	1332	1280		1280			1216	1140	16	1216	1140	16	UC-6
2.5	Series of Disciplines for Candidate Exams and Additional Training			1338	1218	166	124	196	132	1206	1138	12	1132	180	17	
2.5.1	Philosophy and Methodology of Science	1/2		1124	172	140			132	162	140		162	132	13	UC-5
2.5.2	Foreign Language	1/2		1142	196			196		172	148		170	148	14	UC-6
2.5.3	Information Technologies: Basics		1/1	172	150	126	124			172	150	12				UC-7
Number of Hours				1522	696	262	338	96		952	432	30	570	264	18	
Number of Hours per Week										24			24			
Number of Course Projects																
Number of Exams				6						4			2			
Number of End-of-term tests				10						6			2+2d			



IV. Internship				V. Research			VI. Final Certification
Name of the practice	Semester	Weeks	Credits	Semester	Weeks	Credits	Master's Thesis
Scientific research	2	3	4	2	5	8	

VII. Competency Matrix

Competency Code	Competency Name	Module Code, Discipline Code
UC-1	To provide communication, demonstrate leadership skills, be capable of team building and development of strategic goals and objectives	1.2
UC-2	To develop innovative receptivity and ability to innovate	1.2
UC-3	To predict the conditions for the implementation of professional activities and solve professional problems under conditions of uncertainty	1.3.1
UC-4	To apply psychological and pedagogical methods and information and communication technologies in education and management	1.3.2
UC-5	To be able to apply scientific cognition methods in research activity, to generate and implement innovative ideas	2.5.1
UC-6	To use a foreign language for communication in interdisciplinary and scientific environment, in various formats of international cooperation, scientific research and innovative activity	2.4.1, 2.5.2
UC-7	To solve research and innovation tasks based on the use of information and communication technologies	2.5.3
DPC-1	To form and maintain land management and land cadastral documentation, apply regulatory legal acts on the protection and use of land based on organizational, legal and scientific approaches to land management, maintaining the state land cadastre, the state urban planning cadastre of the Republic of Belarus and other cadastres	1.1.1
DPC-2	To use methods and means of integrating modern information technologies for collecting, processing, using and analyzing geodetic and spatial data	1.1.2
SC-1	To be able to apply mathematical foundations of machine learning theory and algorithms for constructing artificial neural networks	2.1.1
SC-2	To apply algorithms and programming skills in Python to process geodetic and spatial data	2.1.2
SC-3	To apply methods and algorithms (including intellectual ones) for solving problems of searching, recognizing and processing objects in images, processing and improving images, calculating the objects characteristics in images	2.1.3
SC-4	To use techniques for automated analysis of spatial data in modern geoinformation software applications	2.2.1
SC-5	To apply simulation and predictive modeling algorithms for spatiotemporal data	2.2.2
SC-6	To be able to apply methods of digital laser scanning of the territory using unmanned aerial vehicles	2.2.3
SC-7	To apply geographic information system and remote sensing data to solve research and innovative tasks in land resource management	2.2.4
SC-8	To be able to use GNSS receivers, organize and carry out satellite measurements, perform computational processing of results	2.3.1
SC-9	To apply methods and algorithms for automated processing of Earth remote sensing data for thematic interpretation	2.3.2

Developed on the basis of the Model Curriculum for the specialty 7-06-0532-03 «Land Management, Cadastres, Geodesy and Geomatics» (registration №7-06-05-011/np., 18.01.2023)  
\*- Depending on the level of Russian language of foreign citizens, the volume of classroom hours may change (increase/decrease (but not less than 140 classroom hours)/exemption from the studying the discipline).  
d - differentiated credit.

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Recommended for approval by the  
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Belarusian State University  
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