KSPEU

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Budgetary Educational Institution of Higher Education
«KAZAN STATE POWER ENGINEERING UNIVERSITY»
(FSBEI HE «KSPEU»)

APPROVED
Director of the Institute of Digital Technologies and Economics
_____Zainullin R.R.
«24»_____February_____2026

WORKING PROGRAM OF THE DISCIPLINE

B1.M.11.04 Software and programming in professional activities

Field of training	38.03.02 Management
Qualification	Bachelor's Degree

Kazan, 2026

The program was developed by:

Name of the department	Position, academic degree, academic rank	Full name of the developer
Management	Associate Professor, Candidate of Social Sciences, Associate Professor	Burganova T.A..

Coordination	Name of department	Date	Protocol number	Signature
Approved	Department of "Management"	10.02.2026	Protocol Num.5	_____ Head department management, doctor of social sciences, professor Makhiyanova A.V.
Agreed	Department of "Management"	10.02.2026	Protocol Num.5	_____ Head department management, doctor of social sciences, professor Makhiyanova A.V.
Agreed	Educational and Methodological Council of the Institute	24.02.2026	Protocol Num.6	_____ Director, Ph.D., Associate Professor, Zainullin R.R.
Approved	Academic Council of the Institute	24.02.2026	Protocol Num.6	_____ Director, Ph.D., Associate Professor, Zainullin R.R.

1. The purpose, objectives and planned learning outcomes of the discipline

The purpose of mastering the discipline B1.M.11.04 “Software and programming in professional activity” is to study the theoretical and applied aspects of using modern information technologies in analyzing the activities of an organization and making management decisions.

The objectives of the course are:

- Developing skills and abilities in the use of computers and information and communication technologies in solving management problems for the purpose of information support for state and municipal administration;
- Developing skills and abilities for participating in the creation and updating of information databases for management decision-making;
- Developing practical skills in working with a personal computer, using technologies for preparing electronic documents, performing calculations in spreadsheets, presenting information, using methods and tools for searching and machine translation of information on the Internet;
- Acquiring solid knowledge and practical skills in the field determined by the main objective of the course;
- Familiarization with information technology;
- Acquisition of basic techniques for using information technology to analyze economic processes;
- Study of the classification and use of various types of information technologies for the accumulation, storage, and use of information for decision-making;
- Mastery of information technology procedures for designing the most important types of technological support for economic activity;
- Identification of the specific features of the implementation of integrated information systems and technologies in professional activities and their application in organizational management systems.
- Developing skills for independent study of specialized literature;
- Developing skills for independent work and organizing research.

Competencies and indicators developed in students:

Competence code and name	Indicator code and name	Planned learning outcomes for the discipline (knowledge, ability, mastery)
GPC-2 Is able to collect, process, and analyze data necessary for solving management tasks using modern tools and intelligent information and analytical systems.	GPC-2.6 Able to collect, process, and analyze the initial information necessary to solve management and economic tasks using modern tools.	*Knowledge:* methods of collecting, processing, and analyzing information necessary for solving management and economic problems. *Ability:* practical application of modern tools for collecting, processing, and analyzing information. *Possess:* skills in practical application of modern tools for collecting, processing, and analyzing information.
GPC-5 Able to use modern information technologies and software tools, including the management of large data sets and their intelligent analysis, in solving professional tasks.	GPC-5.1 Able to apply modern information technologies and software tools in solving professional tasks.	*Knowledge:* modern information technologies and software for solving management and economic problems. *Ability:* to apply modern information technologies and software to solve professional problems. *Possess:* skills in applying modern information technologies and software to solve professional problems.
	GPC-5.2 Able to apply modern information technologies, including managing large data sets and conducting their intelligent analysis.	*Knowledge:* principles of database organization and database management systems (DBMS). *Ability:* to apply modern database management information technologies using Microsoft Access as an example. *Possess:* skills in applying modern database management information technologies using Microsoft Access as an example.
GPC -6 Able to understand the principles of modern information technologies and use them to solve professional tasks.	GPC-6.2 Possesses the skills to apply digital technologies to solve professional tasks, taking into account the basic requirements of information security.	*Knowledge:* modern information technologies for solving professional problems. *Ability:* to apply modern information technologies to solve professional problems. *Possess:* skills in applying modern information technologies to solve professional problems.

2. The discipline's place in the educational program's structure

Previous disciplines (modules), practical training, research, etc.: Information Technology, Management Information Systems.

Subsequent disciplines (modules), practical training, research, etc.: Systems Analysis in Management.

3. Course Structure and Content

3.1. Course Structure

For full-time study

Type of academic work	Total credits	Total hours	Semesters			
			5	6	7	8
TOTAL WORK INTENSITY OF THE DISCIPLINE	12	432	114	110	110	98
CONTACT WORK*	3,3	118	34	30	30	24
AUDITORIUM WORK	3,3	118	34	30	30	24
Lectures	1,6	58	18	14	14	12
Practical (seminar) classes	1,7	60	16	16	16	12
Laboratory work	-	-	-	-	-	-
INDEPENDENT STUDENT WORK	8,7	314	80	80	80	74
Review of course material	8,7	314	80	80	80	74
Course project	-	-	-	-	-	-
Coursework	-	-	-	-	-	-
Preparation for midterm assessment	0	0	0	0	0	0
Interim assessment:			C	C	C	C
			-	-	-	-

For full-time and part-time education

Type of academic work	Total credits	Total hours	Semesters			
			8	9	B	C
TOTAL WORK INTENSITY OF THE DISCIPLINE	12	432	108	108	108	108
CONTACT WORK*	3,6	128	32	32	32	32
AUDITORIUM WORK	3,6	128	32	32	32	32
Lectures	1,8	64	16	16	16	16
Practical (seminar) classes	1,8	64	16	16	16	16
Laboratory work	-	-	-	-	-	-
INDEPENDENT STUDENT WORK	8	288	72	72	72	72
Review of course material	8	288	72	72	72	72
Course project	-	-	-	-	-	-
Coursework	-	-	-	-	-	-

Preparation for midterm assessment	0,4	16	4	4	4	4
Interim assessment:			C	C	C	C
			-	-	-	-

3.2. The content of the discipline, structured by sections and types of classes

Sections of the discipline	Total hours	Distribution of labor intensity by types of academic work				Forms and types of control	Indices of indicators of developing competencies
		lectures	lab. worker	practical classes	independent work		
Section 1. Introduction to the theory of databases and information systems	114	18		16	80	CC1	GPC-2.6K, GPC-2.6A GPC-5.2K, GPC-5.2A, GPC-5.2P
Credit	0				0	EM 1	GPC-2.6K, GPC-2.6A, GPC-5.2K, GPC-5.2A
Total for 5th semester	**114**	**18**		**16**	**80**		
Section 2. Information technology by areas of activity. Fundamentals of information security	110	14		16	80	CC2	GPC -2.6K, GPC-2.6A GPC-5.2K, GPC-5.2A, GPC-5.2P**,** GPC-6.2K, GPC-6.2A, GPC-6.2P
Credit	0				0	EM 2	GPC-2.6K, GPC-2.6A, GPC-5.2K, GPC-5.2A, GPC-5.2P, GPC-6.2K, GPC-6.2A, GPC-6.2P
Total for 6th semester	**110**	**14**		**16**	**80**		
Section 3. Methods of modeling and analyzing business processes	110	14		16	80	CC3	GPC-2.6K, GPC-2.6A, GPC-5.1K, GPC-5.1A, GPC-5.1P
Credit	0				0	EM 3	GPC-2.6K, GPC-2.6A, GPC-5.1K, GPC-5.1A, GPC-5.1P
Total for 7th semester	**110**	**14**		**16**	**80**		
Section 4. Project Management in MS Project	98	12		12	74	CC4	GPC-2.6K, GPC-2.6A, GPC-5.1K, GPC-5.1A, GPC-5.1P
Credit	0				0	EM 4	GPC-2.6K, GPC-2.6A, GPC-5.1K, GPC-5.1A, GPC-5.1P

Total for 8th semester	**98**	**12**		**12**	**74**		
TOTAL	**468**	**54**	**36**	**54**	**324**		

3.3. Contents of the discipline

Topic number	Topic title	Number of hours
Section 1. Introduction to Database and Information Systems Theory		
1.1	Introduction to Databases	2
1.2	Database Development Technology	2
1.3	Automated Information Systems	2
1.4	Information Systems Composition	2
1.5	The Enterprise as a Management Object	2
1.6	Information Technologies for Management	6
1.7	Information Technologies for Business Development	2
Section 2. Information technology by areas of activity. Fundamentals of information security		
2.1	Information Technology in Public Administration	2
2.2	Information Technology in Financial Management	2
2.3	Information Technology in Production Management	2
2.4	Information Technology in Human Resources Management	2
2.5	Information Systems for Document Management	2
2.6	Fundamentals of Information Security	4
Section 3. Methods of modeling and analyzing business processes		
3.1	Functional and Process-Based Approaches to Management	2
3.2	Introduction to Business Processes	2
3.3	Business Process Modeling	2
3.4	Structural Modeling Methodologies	2
3.5	UML Object-Oriented Language	2
3.6	ARIS Integrated Methodology	2
3.7	Business Process Analysis	2
Section 4. Project Management in MS Project		
4.1	Introduction to Project Management	2
4.2	Project Task Planning in MS Project	2
4.3	Tables and Views in MS Project	2
4.4	Resources and Assignments in MS Project	2
4.5	Project Analysis in MS Project	2
4.6	Project Reporting in MS Project	2

3.4. Thematic plan for practical classes

Semesters 5, 6.

1. Creating a new "Dean's Office" database.
2. Creating database tables.

3. Creating relationships between tables in the database.
4. Ensuring data integrity in the database.
5. Reference book interface. Creating forms.
6. Reference book interface. Editing forms.
7. Worksheet interface. Creating forms.
8. Worksheet interface. Editing forms.
9. Database filtering technologies.
10. Database sorting technologies.
11. Data processing using select queries.
12. Data processing using select queries. Calculated fields in a query.
13. Developing output documents for the information system.
14. Badge report.
15. User interface. Creating a pushbutton form.
16. User interface. Creating a macro.

Semester 7.
1. Organizational charts in MS Visio (4 hours).
2. Process modeling in IDEF0 and DFD notations in MS Visio.
3. Process modeling in BPLM notation in MS Visio.
4. Creating a context diagram in BPwin.
5. Creating an A0 breakdown diagram in BPwin.
6. Creating an A2 breakdown diagram in BPwin.
7. Creating an IDEF3 diagram in BPwin.

Semester 8.
1. Introduction to project planning.
2. Planning project tasks in MS Project.
3. Creating project resources and assignments in MS Project.
4. Leveling project resources in MS Project.
5. Project analysis in MS Project.
6. Generating project reports in MS Project.

3.5. Thematic plan of laboratory work
This type of work is not provided for in the curriculum.

3.6. Course project/coursework
This type of work is not provided for in the curriculum.

4. Assessment of learning outcomes

Learning outcomes in this discipline are assessed through ongoing monitoring and midterm assessments, conducted using a point-rating system (PRS).

Learning outcomes assessment scale for this discipline:

Competency Code	Competency Indicator Code	Planned learning outcomes for the discipline	Level of development of the competency indicator			
			High	Average	Below Average	Low
			from 85 to 100	from 70 to 84	from 55 to 69	from 0 to 54
			Rating scale			
			excellent	good	satisfactory	not satisfactory
			passed			failed
GPC-2 Is able to collect, process, and analyze data necessary for solving management tasks using modern tools and intelligent information and analytical systems.	GPC-2.6 Able to collect, process, and analyze the initial information necessary to solve management and economic tasks using modern tools.	know:				
		methods of collecting, processing and analyzing information necessary for solving management and economic problems	Fully knowledgeable in the methods of collecting, processing and analyzing information necessary for solving management and economic problems	Has a fairly complete knowledge of the methods of collecting, processing and analyzing information necessary for solving management and economic problems	Poor knowledge of methods for collecting, processing and analyzing information necessary for solving management and economic problems	Does not know the methods of collecting, processing and analyzing information necessary for solving management and economic problems
		be able to:				
		to apply modern tools for collecting, processing and analyzing information in practice	Freely knows how to apply modern tools for collecting, processing and analyzing information in practice	Able to apply modern tools for collecting, processing and analyzing information in practice	Poor ability to apply modern tools for collecting, processing and analyzing information in practice	Does not know how to apply modern tools for collecting, processing and analyzing information in practice

		possess:				
		skills in the practical application of modern tools for collecting, processing and analyzing information.	Demonstrated skills in the practical application of modern tools for collecting, processing and analyzing information	Basic skills in the practical application of modern tools for collecting, processing and analyzing information were demonstrated.	Has a minimum set of skills in the practical application of modern tools for collecting, processing and analyzing information	Basic skills in the practical application of modern tools for collecting, processing and analyzing information have not been demonstrated
GPC-5 Able to use modern information technologies and software tools, including the management of large data sets and their intelligent analysis, in solving professional tasks.	GPC-5.1 Able to apply modern information technologies and software tools in solving professional tasks.	know:				
		modern information technologies and software for solving management and economic problems	Has a full knowledge of modern information technologies and software for solving management and economic problems	Has a fairly comprehensive knowledge of modern information technologies and software for solving management and economic problems	Poor knowledge of modern information technologies and software for solving management and economic problems	Does not know modern information technologies and software for solving management and economic problems
		be able to:				
		apply modern information technologies and software in solving professional problems	Freely able to apply modern information technologies and software tools in solving professional problems	Able to apply modern information technologies and software tools in solving professional problems	Poor ability to apply modern information technologies and software tools when solving professional problems	Does not know how to apply modern information technologies and software when solving professional problems
		possess:				
		skills in using modern information	Demonstrated skills in the practical application of	Demonstrated basic skills in the practical application of modern	Has a minimum set of skills in the practical	Basic skills in the practical application of

		technologies and software in solving professional problems	modern information technologies and software tools in solving professional problems	information technologies and software in solving professional problems	application of modern information technologies and software in solving professional problems	modern information technologies and software in solving professional problems have not been demonstrated.
GPC-5 Able to use modern information technologies and software tools, including the management of large data sets and their intelligent analysis, in solving professional tasks.	GPC-5.2 Able to apply modern information technologies, including managing large data sets and conducting their intelligent analysis.	know:				
		principles of organizing databases and database management systems (DBMS)	Fully understands the principles of organizing databases and database management systems (DBMS)	Has a fairly comprehensive knowledge of the principles of organizing databases and database management systems (DBMS)	Poor knowledge of the principles of organizing databases and database management systems (DBMS)	Does not know the principles of organizing databases and database management systems (DBMS)
		be able to:				
		apply modern information technologies for database management using Microsoft Access as an example	Freely able to apply modern information technologies for database management using Microsoft Access as an example	Able to apply modern information technologies for database management using Microsoft Access as an example	Poor ability to apply modern information technologies for database management, using Microsoft Access as an example	Does not know how to apply modern information technologies for database management, using Microsoft Access as an example
		possess:				
		skills in applying modern information technologies for database management using Microsoft Access	Demonstrated skills in applying modern information technologies for database management using Microsoft Access as	Basic skills in the application of modern information technologies for database management were demonstrated using Microsoft	Has a minimum set of skills in using modern information technologies for database management, using Microsoft Access	Basic skills in using modern information technologies for database management, using Microsoft Access

		as an example	an example	Access as an example	as an example	as an example, have not been demonstrated
GPC-6 Able to understand the principles of modern information technologies and use them to solve professional tasks.	GPC-6.2 Possesses the skills to apply digital technologies to solve professional tasks, taking into account the basic requirements of information security.	know:				
		modern information technologies for solving professional problems	Fully aware of modern information technologies for solving professional problems	Has sufficient knowledge of modern information technologies to solve professional problems	Poor knowledge of modern information technologies for solving professional problems	Does not know modern information technologies for solving professional problems
		be able to:				
		apply modern information technologies to solve problems of professional activity	Freely able to apply modern information technologies to solve problems of professional activity	Able to apply modern information technologies to solve professional problems	Poor ability to apply modern information technologies to solve professional problems	Does not know how to apply modern information technologies to solve professional problems
		possess:				
		skills in applying modern information technologies to solve professional problems	Demonstrated skills in using modern information technologies to solve professional problems	Basic skills in the use of modern information technologies to solve professional problems were demonstrated	Has a minimum set of skills in using modern information technologies to solve professional problems	Basic skills in using modern information technologies to solve professional problems have not been demonstrated

Assessment materials for ongoing monitoring and midterm assessment are provided in the Appendix to the course curriculum.

A complete set of assignments and materials required for assessing learning outcomes in the course is stored at the developer's department.

5. Educational, methodological, and informational support for the course

5.1. Educational, methodological support

5.1.1. Main literature

1 Ivasenko, A. G., Information technologies in economics and management.: a textbook / A. G. Ivasenko, A. Yu. Gridasov, V. A. Pavlenko. - Moscow: KnoRus, 2023. - 154 p. - ISBN 978-5-406-11150-5. - URL: https://book.ru/book/948685. - Text: electronic.

2. Abrosimova, M. A., Information Technologies in Public and Municipal Administration: a tutorial / M. A. Abrosimova. - Moscow: Knorus, 2021. - 245 p. - ISBN 978-5-406-08176-1. - URL: https://book.ru/book/939223. - Text: electronic.

3. Zhuravlev, A. E. Computer Science. Workshop in Microsoft Office 2016: a tutorial / A. E. Zhuravlev. - 2nd ed., stereotypical. - St. Petersburg: Lan, 2020. - 96 p. - ISBN 978-5-8114-4965-1. - Text: electronic // Lan: electronic library system. — URL: https://e.lanbook.com/book/129228.

5.1.2. Further reading

1. Methods of decision-making by means of the spreadsheet processor MS Excel: workshop / compiled by: A. V. Kalyashina, N. G. Bikeeva. - Kazan: KGEU, 2022. - 37 p. - URL: https://lib.kgeu.ru/. - Text: electronic.

2. Information technologies of management: textbook / B. V. Chernikov. - 2nd ed., revised and enlarged. - Moscow: Publishing House "FORUM": INFRA-M, 2021. - 368 p. - URL: https://ibooks.ru/bookshelf/361299. - ISBN 978-5-8199-0782-5 (Publishing House "FORUM"). - ISBN 978-5-16-013827-5 (INFRA-M, print). - ISBN 978-5-16-104395-0 (INFRA-M, online). - Text: electronic.

5.2. Information Support

5.2.1. Electronic and Internet Resources

Num.	Electronic and online resources	Link
1	Electronic library system "Lan"	https://e.lanbook.com/
2	Electronic library system "ibooks.ru"	https://ibooks.ru/
3	Electronic library system "book.ru"	https://www.book.ru/
4	Encyclopedias, dictionaries, reference books	http://www.rubricon.com
5	Open Education Portal	http://npoed.ru
6	Single-access window to educational resources	http://window.edu.ru

5.2.2. Professional databases / Information and reference systems

Num.	Professional Databases / Information and Reference Systems	Address	Access mode
1	Name of Professional Databases	http://pravo.gov.ru	
2	Official Internet Portal of Legal Information	http://consultant.ru	
3	Consultant Plus Legal Reference System	http://garant.ru	

5.2.3. Licensed and freely distributed software of the discipline

Num.	Name of the software	Distribution	Details of supporting documents

		method (licensed/free)	
1	Windows 7 Professional (Pro)	licensed	Agreement No. 2011.25486 dated November 28, 2011, Soft Line Trade CJSC. Non-exclusive right. Unlimited
2	Windows 7 Professional operating system (FSTEC certified).	licensed	Agreement for Person No. 0000/20, TaxNet Service CJSC. Non-exclusive right. Unlimited.
3	Software: Windows 10	licensed	Agreement No. Tr096148 dated September 29, 2020, Softline Trade LLC. Non-exclusive right. Until September 14, 2021
4	Office Standard 2007 Russian OLP NL Academic Edition+	licensed	Agreement No. 21/2010 dated May 4, 2010, Soft Line Trade CJSC. Non-exclusive right. Unlimited.
5	Office Professional Plus 2007 Russian OLP NL Academic Edition	licensed	Agreement No. 21/2010 dated May 4, 2010, Soft Line Trade CJSC. Non-exclusive right. Unlimited.
6	LMS Moodle	free	Free license. Non-exclusive right. Perpetual.
7	Chrome Browser	free	Free license. Non-exclusive right. Perpetual.

6. Logistical support of discipline

Num.	Type of Academic Work	Name of special rooms and rooms for independent work	Equipment for specialized rooms and rooms for independent work
1	Lectures	Classroom for lecture-type classes	Screen, multimedia projector, portable equipment: laptop.
2	Practical Classes	Classroom for seminar-type classes, group and individual consultations, ongoing assessment, and midterm assessment	Classroom board, screen on a tripod, projector, computer with monitor (8 units).
3	Independent Student Work	Computer lab with Internet access B-600a	All-in-one computers (30 units), video surveillance system (6 video cameras), projector, screen.
		Library reading room	Projector, portable screen, thin clients (13 units), computers (5 units)

7. Features of the organization of educational activities for people with disabilities and people with disabilities

Individuals with disabilities (IHDs) and those with disabilities have the opportunity to move freely between academic and laboratory buildings, access all floors of academic and laboratory buildings, and study in classrooms and other spaces, taking into account their psychophysical development and health status.

Accessibility to all academic spaces is provided for IHDs and those with musculoskeletal disorders. Information on special conditions created for IHDs and those

with disabilities is available on the University website www//kgeu.ru. Technical assistance is available from an assistant, as well as sign language and tactile sign language interpreters.

To adapt reference and educational material for IHDs and those with impaired hearing, the following conditions are provided:

- To improve orientation in the classroom, signals are used to announce the start and end of classes (the word "bell" is written on the board);
- the teacher attracts the attention of a hearing-impaired student with a gesture (a hand is placed on the shoulder, a gentle tap is made);
- when speaking with a student, the teacher looks at them, speaks clearly, in short sentences, and allows for lip reading.

Compensation for speech and intellectual development difficulties in hearing-impaired students is achieved through:

- the use of diagrams, charts, drawings, and computer presentations with hyperlinks that comment on individual image components;
- regular use of exercises to graphically highlight the essential features of objects and phenomena;
- providing the student with the opportunity to receive targeted consultations via email as needed.

To ensure that reference, educational, and outreach materials provided by the educational program for the chosen field of study are accessible to individuals with disabilities and visual impairments, the following conditions are ensured:

- the official website is adapted to accommodate the special needs of individuals with visual impairments, and large-font reference information on the class schedule is provided;
- the teaching staff and their interlocutor (if necessary), present at the class, introduce themselves to the student, and each time the person to whom the teaching staff is addressing is identified;
- The actions, gestures, and movements of the teaching staff are commented on briefly and clearly;
- Printed information is provided in large font (at least 18 points) and is fully audible;
- The required level of lighting in the rooms is ensured;
- The opportunity to use computers during classes and the right to record explanations on a voice recorder (at the students' discretion) is provided.

The format for conducting ongoing and midterm assessments for students with disabilities is determined by the teaching staff in accordance with the curriculum. If necessary, students with disabilities, taking into account their individual psychophysical characteristics, are given the opportunity to complete midterm assessments orally, in writing on paper, on a computer, in the form of a test, etc., or are given additional time to prepare a response.

8. Methodological recommendations for teachers on organizing educational work with students.

Methodological support for the student development process is one of the determining factors for high-quality education. By demonstrating high professionalism, erudition, a clear civic position, self-discipline, and a creative approach to solving professional problems, a university professor contributes to the development of a well-rounded personality throughout the educational process.

When implementing this course, a professor can use the following educational methods:

- Methods of shaping individual consciousness (conversation, debate, suggestion, instruction, control, explanation, example, self-control, storytelling, advice, persuasion, etc.);
- Methods of organizing activities and shaping behavioral experience (tasks, public opinion, pedagogical requirements, assignments, training, habituation, creating educational situations, training, exercises, etc.);
- Methods of motivating activity and behavior (approval, encouragement of social activity, censure, creating situations of success, creating situations for emotional and moral experiences, competition, etc.)

When implementing this course, the teacher must consider the following areas of educational activity:

Civic and Patriotic Education:

- developing in students a holistic worldview, Russian identity, respect for their family, society, the state, the spiritual, moral, and sociocultural values accepted in the family and society, and respect for the national, cultural, and historical heritage, and fostering a desire to preserve and develop it;
- developing students' active civic stance based on the traditional cultural, spiritual, and moral values of Russian society, to enhance their ability to responsibly exercise their constitutional rights and responsibilities;
- developing students' legal and political awareness, expanding their constructive participation in decision-making affecting their rights and interests, including through various forms of self-organization, self-government, and socially significant activities;
- developing motivations, moral, and meaningful attitudes that enable them to resist extremism, xenophobia, discrimination based on social, religious, racial, and national characteristics, interethnic and interfaith intolerance, and other negative social phenomena.

Spiritual and moral education:

- - fostering a sense of dignity, honor, and honesty, conscientiousness, and respect for parents, teachers, and the elderly;
- - developing principles of collectivism and solidarity, a spirit of mercy and compassion, and a habit of caring for people in difficult life situations;
- - fostering solidarity and a sense of social responsibility toward people with disabilities, overcoming psychological barriers to people with disabilities;
- - developing an emotionally rich and spiritually elevated attitude toward the world, and the ability and skill to share one's aesthetic experience with others.

Cultural and educational education:

- developing an aesthetic worldview;

- fostering respect for the cultural values of one's hometown, region, and country;

- enhancing students cognitive activity.

Scientific and educational education:

- developing a scientific worldview in students;

- developing the ability to acquire knowledge;

- developing skills in analyzing and synthesizing information, including in the professional field.

Changes and approvals for the new academic year

Num	Section number of amendments	Date of modification	Contents of the changes	"Agreed" Head of the Department implementing the discipline	"Agreed" Chairman of the Institute (Faculty)'s Teaching and Methods Department, which includes the graduating department
1	2	3	4	5	6
1					
2					
3					

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ASSESSMENT MATERIALS
for the subject

B1.M.11.04 Software and programming in professional activities.

Kazan, 2026

Assessment materials for this course are designed to evaluate learning outcomes against competency achievement indicators.

Learning outcomes for this course are assessed through ongoing assessment (CA) and midterm assessment, conducted using a point-rating system (PRS)

1. Technological map

Semestr 5

Section name	Forms and types of control	Rating indicators					Interim assessment
		I current control	Additional points to CC1	II current control	Additional points to CC2	Total	
Section 1. Introduction to Databases and Information Systems	**CC1**	**15**	**0-15**			**15-30**	**15-30**
Test or Written Survey		10					
Independent Work Report		5					
Section 2. Information Technology in Management and Business Development	**CC2**			**15**	**0-15**	**15-30**	**15-30**
Test or Written Survey				10			
Independent Work Report				5			
Midterm Assessment (Credit)	**EM1**						**0-45**
Midterm Assessment Assignment							0-15
Written based on student tickets							0-30

Semestr 6

Section name	Forms and types of control	Rating indicators					Interim assessment
		I current control	Additional points to CC1	II current control	Additional points to CC2	Total	
Section 3. Information Technology by Area of Activity	**CC3**	**15**	**0-15**			**15-30**	**15-30**
Test or Written Survey		10					
Independent Work Report		5					
Section 4. Information Security Fundamentals	**CC4**			**15**	**0-15**	**15-30**	**15-30**
Test or Written Survey				10			
Independent Work Report				5			
Midterm Assessment (Credit)	**EM2**						**0-45**
Midterm Assessment Assignment							0-15
Written based on exam tickets							0-30

Semestr 7

Section name	Forms and types of control	Rating indicators					Interim assessment
		I current control	Additional points to CC1	II current control	Additional points to CC2	Total	
Section 5. Introduction to Business Processes	**CC5**	**15**	**0-15**			**15-30**	**15-30**
Test or Written Survey		10					
Independent Work Report		5					
Section 6. Methods of Modeling and Analyzing Business Processes	**CC6**			**15**	**0-15**	**15-30**	**15-30**
Test or Written Survey				10			
Independent Work Report				5			
Midterm Assessment (Credit)	**EM3**						**0-45**
Midterm Assessment Assignment							0-15
Written based on exam tickets							0-30

Semestr 8

Section name	Forms and types of control	Rating indicators					Interim assessment
		I current control	Additional points to CC1	II current control	Additional points to CC2	Total	
Section 7. Project Task Planning in MS Project	**CC7**	**15**	**0-15**			**15-30**	**15-30**
Test or Written Survey		10					
Independent Work Report		5					
Section 8. Project Analysis and Reporting in MS Project	**CC8**			**15**	**0-15**	**15-30**	**15-30**
Test or Written Survey				10			
Independent Work Report				5			
Midterm Assessment (Credit)	**EM4**						**0-45**
Midterm Assessment Assignment							0-15
Written based on work tickets							0-30

2. Assessment materials for ongoing monitoring and midterm assessment

Learning outcome assessment scale for the discipline:

Competency Code	Competency Indicator Code	Planned learning outcomes for the discipline	Level of development of the competency indicator			
			High	Average	Below Average	Low
			from 85 to 100	from 70 to 84	from 55 to 69	from 0 to 54
			Rating scale			
			excellent	good	satisfactory	not satisfactory
			passed			failed
GPC-2 Is able to collect, process, and analyze data necessary for solving management tasks using modern tools and intelligent information and analytical systems.	GPC-2.6 Able to collect, process, and analyze the initial information necessary to solve management and economic tasks using modern tools.	know:				
		methods of collecting, processing and analyzing information necessary for solving management and economic problems	Fully knowledgeable in the methods of collecting, processing and analyzing information necessary for solving management and economic problems	Has a fairly complete knowledge of the methods of collecting, processing and analyzing information necessary for solving management and economic problems	Poor knowledge of methods for collecting, processing and analyzing information necessary for solving management and economic problems	Does not know the methods of collecting, processing and analyzing information necessary for solving management and economic problems
		be able to:				
		to apply modern tools for collecting, processing and analyzing information in practice	Freely knows how to apply modern tools for collecting, processing and analyzing information in practice	Able to apply modern tools for collecting, processing and analyzing information in practice	Poor ability to apply modern tools for collecting, processing and analyzing information in practice	Does not know how to apply modern tools for collecting, processing and analyzing information in practice
		possess:				
		skills in the practical	Demonstrated skills in the practical	Basic skills in the practical application	Has a minimum set of skills in the	Basic skills in the practical

		application of modern tools for collecting, processing and analyzing information.	application of modern tools for collecting, processing and analyzing information	of modern tools for collecting, processing and analyzing information were demonstrated.	practical application of modern tools for collecting, processing and analyzing information	application of modern tools for collecting, processing and analyzing information have not been demonstrated
GPC-5 Able to use modern information technologies and software tools, including the management of large data sets and their intelligent analysis, in solving professional tasks.	GPC-5.1 Able to apply modern information technologies and software tools in solving professional tasks.	know:				
		modern information technologies and software for solving management and economic problems	Has a full knowledge of modern information technologies and software for solving management and economic problems	Has a fairly comprehensive knowledge of modern information technologies and software for solving management and economic problems	Poor knowledge of modern information technologies and software for solving management and economic problems	Does not know modern information technologies and software for solving management and economic problems
		be able to:				
		apply modern information technologies and software in solving professional problems	Freely able to apply modern information technologies and software tools in solving professional problems	Able to apply modern information technologies and software tools in solving professional problems	Poor ability to apply modern information technologies and software tools when solving professional problems	Does not know how to apply modern information technologies and software when solving professional problems
		possess:				
		skills in using modern information technologies and software in solving professional	Demonstrated skills in the practical application of modern information technologies and software tools in	Demonstrated basic skills in the practical application of modern information technologies and software in solving	Has a minimum set of skills in the practical application of modern information technologies and	Basic skills in the practical application of modern information technologies and

		problems	solving professional problems	professional problems	software in solving professional problems	software in solving professional problems have not been demonstrated.
GPC-5 Able to use modern information technologies and software tools, including the management of large data sets and their intelligent analysis, in solving professional tasks.	GPC-5.2 Able to apply modern information technologies, including managing large data sets and conducting their intelligent analysis.	know:				
		principles of organizing databases and database management systems (DBMS)	Fully understands the principles of organizing databases and database management systems (DBMS)	Has a fairly comprehensive knowledge of the principles of organizing databases and database management systems (DBMS)	Poor knowledge of the principles of organizing databases and database management systems (DBMS)	Does not know the principles of organizing databases and database management systems (DBMS)
		be able to:				
		apply modern information technologies for database management using Microsoft Access as an example	Freely able to apply modern information technologies for database management using Microsoft Access as an example	Able to apply modern information technologies for database management using Microsoft Access as an example	Poor ability to apply modern information technologies for database management, using Microsoft Access as an example	Does not know how to apply modern information technologies for database management, using Microsoft Access as an example
		possess:				
		skills in applying modern information technologies for database management using Microsoft Access as an example	Demonstrated skills in applying modern information technologies for database management using Microsoft Access as an example	Basic skills in the application of modern information technologies for database management were demonstrated using Microsoft Access as an example	Has a minimum set of skills in using modern information technologies for database management, using Microsoft Access as an example	Basic skills in using modern information technologies for database management, using Microsoft Access as an example, have not been demonstrated

GPC-6 Able to understand the principles of modern information technologies and use them to solve professional tasks	GPC-6.2 Possesses the skills to apply digital technologies to solve professional tasks, taking into account the basic requirements of information security	know:				
		modern information technologies for solving professional problems	Fully aware of modern information technologies for solving professional problems	Has sufficient knowledge of modern information technologies to solve professional problems	Poor knowledge of modern information technologies for solving professional problems	Does not know modern information technologies for solving professional problems
		be able to:				
		apply modern information technologies to solve problems of professional activity	Freely able to apply modern information technologies to solve problems of professional activity	Able to apply modern information technologies to solve professional problems	Poor ability to apply modern information technologies to solve professional problems	Does not know how to apply modern information technologies to solve professional problems
		possess:				
		skills in applying modern information technologies to solve professional problems	Demonstrated skills in using modern information technologies to solve professional problems	Basic skills in the use of modern information technologies to solve professional problems were demonstrated	Has a minimum set of skills in using modern information technologies to solve professional problems	Basic skills in using modern information technologies to solve professional problems have not been demonstrated

An "**excellent**" grade is awarded for completing the test assignments; in-depth knowledge of modern information technology and software for solving management and economic problems; and complete and informative answers to the questions (theoretical and practical assignments).

A "**good**" grade is awarded for completing the test assignments; understanding of modern information technology and software for solving management and economic problems; and sufficiently complete answers to the questions (theoretical and practical assignments).

A "**satisfactory**" grade is awarded for completing the test assignments, weak answers to the theoretical questions, or failure to complete the practical assignment.

An "**unsatisfactory**" grade is awarded for weak or incomplete completion of the test assignments, weak or incomplete answers to the theoretical questions, and failure to complete the practical assignment..

3. List of assessment tools

Brief description of the assessment tools used for ongoing monitoring of student progress and midterm assessment in the subject:

Name of the assessment tool	Brief description of the assessment tool	Description of the assessment tool
Survey by sections (topics)	Knowledge of the basic concepts of the topic/section/discipline	List of definitions of key concepts of the topic/discipline
Test (Test)	A system of standardized tasks that allows for the automation of the procedure for measuring the level of student knowledge and skills	Set of test tasks

4. List of assessment tasks or other materials necessary for assessing knowledge, skills, and abilities characterizing the stages of competency development during the course.

Assignment examples.

For ongoing assessment CC1:

Competency tested: GPC-2, GPC-2.6, GPC-5, GPC-5.2.

Examples of test questions.

Question	*Answer options*
What are the main data models considered in database theory?	horizontal
	vertical
	hierarchical
	linear
	network
	relational
What subsystems are identified within information systems?	horizontal
	vertical
	functional
	hierarchical
	supporting
Specify the enterprise management functions that are supported by modern information systems	planning
	bonuses
	accounting
	analysis
	distribution
	regulation

A complete set of assignments and materials required for assessing learning outcomes in this course is stored in the developer's department and contains 10 closed-ended questions and 50 questions.

Examples of questions for the current survey in Section 1:

1. Define a database.
2. What is a "subject area"?
3. What is a "data model"?
4. Describe the basic information flows circulating in an economic system.

5. List the bases for classifying information systems.

For the EM-1 midterm assessment:

The EM-1 midterm assessment consists of 20 tests, each with 2 questions.

Sample tests:

Ticket #1

1. Basic concepts of database theory.
2. MS Access DBMS. Creating a new "Dean's Office" database.

Ticket #2

1. Hierarchical data model. Properties of a hierarchical model.
2. MS Access DBMS. Developing an interface for entering data into directories. Creating a form using the Wizard.

For ongoing assessment CC2:

Tested competencies: GPC-2, GPC-2.6, GPC-5, GPC-5.2, GPC-6, GPC-6.2.

Sample test questions.

Question	*Answer options*
Электронное правительство включает:	Online services for citizens and businesses on a single portal
	Electronic document management in government and parliamentary structures
	Social networks
	Online chats
	Digital signatures, electronic keys, smart cards, and other means of authorized access to and transactions with information
Интегрированные системы управления персоналом решают следующие задачи:	Personnel records
	Timesheets
	Payroll
	Tax reporting
	Calculation of required materials
	Client settlements
Средства реализации комплексной защиты информации делятся на:	Hardware
	Software
	Organizational tools
	Ethical tools

A complete set of assignments and materials required for assessing learning outcomes in this course is stored in the developer's department and contains 10 closed-ended and 50 questions.

Examples of questions for the current survey in Section 2:

1. What is an information system? A telecommunications system? An automated system?
2. What are the legal concepts in the field of information security?
3. Which Russian government agencies exercise control and regulatory functions over all government information resources?

4. What financial management tools are included in ERP systems?

5. What is the fundamental difference between ERP and MES systems?

For the EM-2 midterm assessment:

The EM-2 midterm assessment is conducted using 20 tests, each with 2 questions.

Ticket examples:

Ticket #1

1. Information technology in public administration.

2. MS Access DBMS. Database sorting technologies. Simple sorting by one field.

Ticket #2

1. HR management information system "AiT:\HR Management". Functions, advantages, and disadvantages.

2. MS Access DBMS. Developing output documents. Report based on a query with a parameter.

For ongoing assessment CC3:

Tested competencies: GPC-2, GPC-2.6, GPC-5, GPC-5.1.

Test question examples.

Question	*Answer options*
What is the main disadvantage of the functional approach?	a clear organizational structure hierarchy
	does not promote horizontal communication
	there are no business processes – only command execution
	difficult to create an improvement project
What is the main disadvantage of the functional approach?	faster achievement of results
	management vector – customer-focused, not manager-focused
	business transparency increases
	there is someone responsible for the results of each process

A complete set of assignments and materials required for assessing learning outcomes in this course is stored in the developer's department and contains 10 closed-ended and 50 questions.

Examples of questions for the current survey for Section 3:

1. What is a business process (external, internal)? What are its main properties and principles of identification?

2. What are resources and the resource environment? What types of resources do you know?

3. Classify the types of analysis according to the objects, analyzed states, and analysis methods.

4. How is the cost of IDEF0 model blocks and their outputs determined using the FSA method?

For the EM-3 midterm assessment:

The EM-3 midterm assessment consists of 20 questions, each containing 2 questions.

Sample questions:

Ticket #1

1. Classification of business processes (by level of importance, structure, purpose).

2. Process modeling using IDEF0 notation.

Ticket #2

1. Reflection of the process approach in international standards.

2. Process modeling using IDEF3 notation.

For ongoing assessment CC4:

Competencies assessed: GPC-2, GPC-2.6, GPC-5, GPC-5.1.

Test

Question	*Answer options*
What is meant by the term "project" in Microsoft Projects?	A temporary enterprise designed to create unique products or services
	a set of documents for the construction of a building or structure
What is meant by the term "project" in Microsoft Projects?	usefulness,
	temporary nature,
	uniqueness of results,
	low cost.

A complete set of assignments and materials required for assessing learning outcomes in this course is stored in the developer's department and contains 10 closed-ended and 50 questions.

Examples of questions for the current survey in Section 4:

1. What is a project? What properties does a project have?

2. What is the project life cycle and what are its phases?

3. What project management systems are common in the Russian software market?

4. What two project planning options are used in Microsoft Project?

5. What is the purpose of parametric task duration analysis in Microsoft Project?

For the EM-4 midterm assessment:

The EM-4 midterm assessment is conducted using 20 questions, each containing 2 questions.

Question examples:

Ticket #1

1. Project management. Project management classification and standards. Main project management subsystems. Corporate project management systems.

2. Generalized data structure in MS Project. The concept of a "resource." Basic resource properties. Representation on a Gantt chart.

Ticket #2

1. Project classification and methods used to manage them. The concept of a critical path. An example of calculating a critical path.

2. Tasks in MS Project. Main task types. Task list. Task table.