Syllabus

Department **"**Medical Biophysics and Information Technologies"
Work program of the course "Information and Communication Technologies"
Educational program 6B10118 – "Medical and preventive care"

1.	**General information about the course**		
1.1	Course code: ICT 1105	1.6	Academic year: 2025-2026
1.2	Course name: Information and Communication Technology	1.7	Year: 1
1.3	Prerequisites: -	1.8	Term: 1
1.4	Postrequisites: Project Activities and biostatistics	1.9	Number of credits (ECTS): 3
1.5	Cycle: General Education Subjects	1.10	Component: Mandatory component
2.	**Course content**		
Fundational concepts of information and communication technologies, including architecture of computer systems, types of software, database systems, data analysis and management, networking, cybersecurity, internet technologies, cloud technologies, multimedia technologies, smart technologies, AI fundamentals and its applications.			
3.	**Form of summative assessment**		
3.1	Testing ✅	3.5	Coursework
3.2	Writing	3.6	Essay
3.3	Oral	3.7	Project
3.4	OSPE / OSCE	3.8	Other (specify)
4.	**Objective of the course**		
To develop the ability to critically evaluate and analyze processes, methods of searching, storing, and processing information, and ways of collecting and transmitting information through digital technologies.			
5.	**Learning outcomes**		
LO1	Explain the purpose, content, and development trends of information and communication technologies, and justify the choice of the most suitable technology for solving specific tasks.		
LO2	Explain methods for collecting, storing, and processing information, and ways to implement information and communication processes.		
LO3	Describe the architecture of computer systems and networks, including the purpose and functions of key components.		
LO4	Utilize Internet resources, cloud services, and mobile applications for searching, storing, processing, and disseminating information.		
LO5	Apply software and hardware for computer systems and networks to collect, transmit, process, and store data.		
LO6	Analyze and justify the choice of methods and tools for information security.		
LO7	Develop data analysis and management tools for various activities using digital technologies.		
LO 8	Demonstrate the ability to apply the theory, methods, and principles of artificial intelligence in the use of basic intelligent software systems		
5. 1	**Course LO**	**EP learning outcomes, which are related to the course learning outcomes**	
	LO1 LO2 LO3 LO4	LO1 It allows for critical analysis and practical application of reliable, up-to-date, scientifically based information and knowledge in the fields of socio-behavioral, biomedical, hygienic, epidemiological, and clinical sciences	
	LO5 LO6 LO7 LO8	LO3 Mastering information technologies, effectively using information in the field of ensuring the sanitary and epidemiological well-being of the population to introduce new approaches within the scope of their expertise, using artificial intelligence and digitalization to ensure documentation of production processes.	

	LO6 LO7 LO8	LO13 – Demonstrates a broad outlook, critical and analytical thinking, drawing on knowledge of social and natural sciences, digital technologies and the basics of artificial intelligence, and effectively uses modern communication tools in a professional environment.

6. Course Details

6.1 Venue: SKMA, building No.1, Department "Medical Biophysics and Information Technologies". Al-Farabi Square - 1, 5th floor, rooms No. 500-511. Phone 39-57-57, add 1063.

6.2	Number of hours	Prac. lessons	SIWT	SIW
		30	9	51

7. Information about teachers

№	Full name	Academic degree and position	Email address
1	Ivanova Marina Borisovna	PhD, professor	marina-iv@mail.ru
2	Ormanov Nurlan Kerimbekovich	PhD, professor	nurlanormanov2@gmail.com
3	Berdiyeva Meruyert Aimambetovna	PhD,ass. prof.	meruert_berdieva@mail.ru
4	Abdrimova Zakhira Maratovna	Master's degree, senior teacher	zakira75@mail.ru
5	Imanbaeva Maral Amanbaevna	Master's degree, senior teacher	maral_81_19@mail.ru
6	Maulenova Akmaral Aitbekovna	Master's degree, senior teacher	maral_tasken@mail.ru
7	Abdrahmanova Zhanil Zhusupovna	Master's degree, senior teacher	zhanil15@mail.ru
8	Baidildaeva Akmaral Sagintaevna	Master's degree, senior teacher	68.akmaral@mail.ru

8. Thematic plan

Week	Topic	Brief content	Course LO	Number of hours	Forms/ Methods/ Technologies of teaching	Forms/ Methods of assessment
1	Practical class/ Introduction to computer systems. Architecture of computer systems	Review of computer systems. Evolution of computer systems. Architecture and components of computer systems. Use of computer systems. Data representation in computer systems. Calculation of metrics of productivity of computer system: speed, efficiency, energy costs, Amdahl's law, CPU time.	LO 1 LO 2 LO 3 LO 4 LO 5	2	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
	SIWT/SIW Consultation on completing the individual assignment / Development of flowcharts of computer devices. Stage 1.	Basic elements of flowcharts. Rules for building flowcharts. Examples of flowcharts/ Creating flowcharts describing the operation of various computer devices.	LO 3 LO 4 LO 5	1/5	/Demonstration,instruction / computer training, Flowchart software	Flowchart /According to the checklist
2	Software. Operating systems. Human-	Software. Types of the software, purpose and characteristic. Basic concepts	LO 1 LO 2 LO 4	2	Discussion, demonstration,instruction,	MCQ, practical assignment,

	computer interaction	of OS. Evolution of operating systems. Classification of operating systems, including for mobile devices. Classification of desktop applications. User interface as means of human-computer interaction. Usability of interfaces. Types of interfaces: command line interface, text interface, graphic interface. Determination of properties of an operating system. Operation with files and directories.	LO 5 LO 7		completing a practical assignment/ Presentation, computer training, specialized software	participation in discussion /According to the checklist
	SIWT/SIW/ Consultation on completing the individual assignment /Collecting, the analysis and structuration of data in the professional environment.	Design and development of a multi-table database: creating tables (including lookup fields, OLE objects, input masks), queries, forms, reports (MS Access)./Design and development of an individual multi-table database related to the future professional field.	LO 3 LO 4 LO 5	1/5	Demonstratio n, instruction / Computer training, MS Access	Database /According to the checklist
3	Practical class/ Database systems	Development of database structure, creation of tables, forms, queries, reports (MS Access).	LO 1 LO 2 LO 4 LO 5 LO 7	2	Completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
4	Practical class/ Database systems	Bases of database systems: concept, characteristic, architecture. Development of database structure, creation of tables, forms, queries, reports (MS Access).	LO 1 LO 2 LO 4 LO 5 LO 7	2	Discussion, demonstratio n, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
	SIWT / SIW / Consultation on completing the individual assignment	Design and development of a multi-table database: creating tables (lookup fields, OLE objects, input mask), queries, forms, reports (MS Access).	LO 4 LO 5 LO 7	1/5	Demonstratio n, instruction / Computer training, MS Access	Database /According to the checklist

	/Collecting, the analysis and structuration of data in the professional environment. Stage 2.	/Design and development of an individual multi-table database related to the future professional field.				
5	Practical class/ Data analysis.	Basics of Data Analysis. Methods of data collection and data classification.	LO 1 LO 2 LO 4 LO 5 LO 7	2	Discussion, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
	SIWT / SIW / Consultation on completing the individual assignment /Description of network topology of the healthcare facility.	Requirements analysis based on the description of the healthcare facility. Designing the network topology. Documenting and justifying the decisions.	LO 1 LO 3 LO 4 LO 5	1/5	Demonstration,instruction/ computer training, 10-Strike Network Diagram	Report and flowchart /According to the checklist
6	Data management	Processing of numerical information, editing formulas and creation of charts in spreadsheet editors (MS Excel).	LO 1 LO 4 LO 5 LO 6 LO 7	2	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
7	Practical class/ Cybersecurity	Security risks of information and their classification. Malicious applications. Measures and means of information protection. The acts of the Republic of Kazakhstan governing legal relations in the sphere of information security. Electronic digital signature. Encryption. Settings of the Firewall program element of the computer network for network traffic monitoring and	LO 1 LO 2 LO 4 LO 5 LO 7	2	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist

		filtering. Working with the various antivirus programs.				
	Midterm control 1 /Preparation for midterm control 1	Introduction to computer systems. Architecture of computer systems. Software. Operating systems. Human-computer interaction. Database systems, Data analysis. Data management. Networks and telecommunications. Cybersecurity. Internet technologies.	LO 1 LO 2 LO 3 LO 4 LO 5 LO 6 LO 7	1/5	Computer testing (MCQ)	Evaluation is carried out using a 100-point scale.
8	Practical class/ Networks and telecommunications.	End devices, data transfer devices, transmission medium. Types of networks. Stack protocols: TCP/IP, OSI. IP addressing. Local and wide area networks. Wire and wireless network technologies. DHCP protocol. Technologies of connection to the Internet. Creation of a simple network configuration. IP addressing.	LO 1 LO 2 LO 4 LO 5	2	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
9	Practical class/ Multimedia technologies	Representation text, audio, video and graphical information in a digital format. Basic technologies for compression of information. 3-D representations of the virtual world and animation. Instruments of development of multimedia applications. Use of multimedia technologies for planning, descriptions of business processes and their visualization. Creating presentations (Canva)	LO 1 LO 4 LO 5	2	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
	SIWT / SIW / Consultation on completing the individual assignment /Creation of video files with use of programs: VideoPad, CapCut, Windows Movie Maker, etc.	Choose a current medical topic. Research and script. Create a storyboard. Use video editing software. Record an edit. Publish.	LO 4 LO 5	1/5	Demonstration, instruction / Computer training, video editing software (VideoPad, CapCut, Windows Movie Maker)	Video file and project / According to the checklist
10	Internet	Basic Internet concepts. The	LO 1	2	Discussion,	MCQ,

	technologies	Uniform Resource Locator (URL), its assignment and components. DNS server. Web technologies. E-mail. Message format. SMTP, POP3, IMAP protocols. Creation of a website using the free website builder (Tilda or Mobirise).	LO 4 LO 5		demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	practical assignment, participation in discussion / According to the checklist
11	Practical class/ Smart technologies	Internet of things. Big data. Technology Block Chain. Use of Smart-services. Green technologies in ICT. Teleconferences. Telemedicine.	LO 4 LO 5 LO 8	2	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
	SIWT / SIW / Consultation on completing the individual assignment /Creation of video files with use of programs: VideoPad, CapCut, Windows Movie Maker, etc.	Choose a current medical topic. Research and script. Create a storyboard. Use video editing software. Record an edit. Publish.	LO 1 LO 4 LO 5 LO 8	1/4	Demonstration, instruction / Computer training	Report /According to the checklist
12	Practical class/ Cloud and mobile technologies	Data centers. Tendencies of development of the modern infrastructure decisions. Principles of cloud computing. Technologies of virtualization. Web service in the Cloud. Main terms and concepts of mobile technologies. Mobile services. Standards of mobile technologies. Introduction to Google Docs and Microsoft Office Web Apps cloud services. Creation accounts to work with cloud services. Study of operation modes associated with file storage, sharing and processing. Use of mobile	LO 4 LO 5 LO 8	2	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist

		technologies for receiving an information access. GPS navigators.				
13	Practical class/ Introduction to AI	Basic concepts of AI. History and development of AI. Knowledge representation models. Fundamentals of AI research. Ethical Considerations in AI	LO 4 LO 5 LO 8	2	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
	SIWT / SIW / Consultation on completing the individual assignment /AI and Society Comparative analysis of AI tools	Studying recent articles and publications on the latest achievements in artificial intelligence. Conducting research and creation a video report about impact of AI on various aspects of public life. Comparing the functionality and effectiveness of various artificial intelligence tools and platforms.	LO 4 LO 5 LO 8	1/4	Demonstration, instruction / Computer training, interview	Report /According to the checklist
14	Practical class/ Introduction to AI tools and platforms. Large Language Models. Generative AI tools.	Studying different AI tools and platforms. Practical use of various tools and platforms for working with AI. Introduction to Large Language Models (LLM). Using LLMs for text generation and summarization. Overview of Generative AI tools. Creating generative art and music using AI tools. Studying possible experiments with various generative art tools to create images and music.	LO 4 LO 5 LO 7	2	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software	MCQ, practical assignment, participation in discussion / According to the checklist
	Midterm control 2 /Preparation for midterm control 2		LO 1 LO 2 LO 3 LO 4 LO 5 LO 6 LO 7 LO 8	1/4	Computer testing (MCQ)	Evaluation is carried out using a 100-point scale.
15	Practical class/ Information technologies in medicine and	The software for the solution of tasks of the specialized professional sphere. Modern IT trends in medicine and	LO 1 LO 4 LO 5	2	Discussion, demonstration, completing a	MCQ, practical assignment, participation

	pharmacy. Prospects of development of ICT	pharmacy. Use of search engines and electronic resources in the professional sphere. Using STATISTICA software for processing medical and pharmaceutical data. Prospects of development in the sphere of the IT market: development of the free software.			practical assignment/ Presentation, computer training,	in discussion / According to the checklist
	Exam preparation and conducting			9		
9.	**Teaching Methods and Assessment Forms**					
9.1	Practical class	Discussion, demonstration, instruction, completing a practical assignment/ Presentation, computer training, specialized software MCQ, practical assignment, participation in discussion / According to the checklist				
9.2	SIWT / SIW	Flowchart, Database, Report and flowchart, Report, Video file and project, Video report with research results / According to the checklist				
9.3	Midterm control	Computer Testing (MCQ). Evaluation is carried out using a 100-point scale.				
10.	**Assessment criteria**					
10.1.	**Criteria for assssing course learning outcomes**					

LO #	Learning outcome	Unsatisfactory	Satisfactory	Good	Excellent
LO1	Explain the purpose, content, and development trends of information and communication technologies, and justify the choice of the most suitable technology for solving specific tasks	Unable to explain the purpose and content of ICT. Incorrectly identifies development trends. Unable to justify the choice of technology for solving specific tasks.	Can explain the purpose and content of ICT in general terms. Has a basic understanding of development trends, but with some inaccuracies. Justifies the choice of technology at a basic level.	Explains the purpose, content, and main trends of ICT well. Able to justify the choice of technology for solving tasks, though with some minor inaccuracies.	Clearly and accurately explains the purpose, content, and development trends of ICT. Confidently and convincingly selects the most suitable technologies for solving specific tasks
LO2	Explain methods for collecting, storing, and processing information, and ways to implement information and communication processes	Incorrectly explains methods for collecting, storing, and processing information. Does not understand how to implement information and communication processes.	Explains the methods in general terms but with errors. Can describe the basic ways of implementing processes, though with some shortcomings.	Explains the methods and ways to implement processes well, though some aspects may require clarification.	Fully and accurately explains methods for collecting, storing, and processing information. Confidently describes ways to implement processes.
LO3	Describe the	Unable to	Has a general	Describes the	Clearly and

	architecture of computer systems and networks, including the purpose and functions of key components	accurately escribe the architecture of computer systems and networks. Makes errors in identifying the purpose and functions of components.	understanding of system and network architecture, but makes mistakes. Can describe key components, though not always accurately.	architecture, purpose, and functions of key components well, though there are minor inaccuracies.	accurately describes the architecture of computer systems and networks, as well as the functions of all key components.
LO4	Utilize Internet resources, cloud services, and mobile applications for searching, storing, processing, and disseminating information	Unable to effectively utilize internet resources, cloud services, and mobile applications.	Can use these tools at a basic level but with limited effectiveness.	Confidently uses internet resources and applications, though there is room for improvement.	Effectively and confidently uses all listed tools to accomplish tasks.
LO5	Apply software and hardware for computer systems and networks to collect, transmit, process, and store data	Unable to properly use software and hardware.	Can use software and hardware, but with limited effectiveness.	Confidently applies software and hardware, though there are minor shortcomings.	Fully proficient in applying software and hardware to accomplish all tasks.
LO6	Analyze and justify the choice of methods and tools for information security	Unable to analyze or justify the choice of methods and tools.	Can perform a basic analysis and justification, but with errors.	Analyzes and justifies choices well, though there are some shortcomings.	Thoroughly analyzes and convincingly justifies the choice of the most appropriate methods and tools.
LO7	Develop data analysis and management tools for various activities using digital technologies	Unable to develop effective tools for data analysis and management.	Can develop basic tools, but with limited functionality.	Develops functional tools, though improvements.	Develops high-quality and effective tools for data analysis and management.
LO8	Demonstrate the ability to apply the theory, methods, and principles of AI in the use of basic intelligent software systems	Does not demonstrate understanding or ability to apply AI theory and methods.	Understands basic principles but struggles to apply them.	Confidently applies AI theory and methods, though with some inaccuracies.	Fully and accurately applies AI theory, methods, and principles in the use of software systems.
10.2.	**Criteria for assessing**				
Checklist for assessing practical class					

Form of Work	Criterion	Description	Points (max 100)
Testing (20 points)	Quality of Answers	All answers are correct	17-20
		Most answers are correct, but there are errors	12-16
		Partially correct answers	7-11
		Many incorrect answers	0-6
Completion of Individual Computer Task (60 points)	Completeness of Task	Fully completed with correct results	50-55
		Completed, but with minor errors	35-49
		Partially completed with significant errors	20-34
		Task completed partially or with multiple errors	0-19
	Adherence to Deadlines	On time	5
		Late	0
Participation in Discussion (20 points)	Activity in Participation	Active participation, constructive comments	5-10
		Participation with minimal comments	3-4
		Passive participation or lack of constructive comments	0-2
	Quality of Argumentation	Clearly formulated and justified arguments	5-10
		Arguments present but not always justified	3-4
		Arguments absent or unconvincing	0-2

Checklist for assessing SIW/SIWT

SIW 1

Form of Work	Criterion	Description	Points (max 100)
Flowchart of computer devices (Lucidchart tool) (40 points)	Accuracy of the Flowchart	The flowchart is fully accurate and reflects all necessary components and processes	20-25
		The flowchart is mostly accurate, but there are minor errors	15-19
		The flowchart has significant errors, with some components and processes missing	5-14
		The flowchart is inaccurate or incomplete	0-4
	Readability and Design	The flowchart is clearly designed in Lucidchart, all elements are easily readable and logically connected	10-15
		The flowchart is generally readable, but there are minor design flaws	5-9
		Readability and design hinder understanding of the flowchart	0-4
Database (MS Access) (60 points)	Tables	All necessary tables are created, properly structured, and relationships between tables are established	15-20
		Tables are created, but there are errors in structure or not all relationships are correctly set	10-14
		Tables are partially created, with significant errors in structure and relationships	5-9
		Tables are missing or incorrect	0-4
	Forms	All necessary forms are created, functional, and user-friendly	7-10
		Forms are created, but their functionality or design needs improvement	4-6
		Forms are partially created or incorrectly designed	0-3

	Queries	Queries are correct, efficiently retrieve and process data	10-15
		Queries are created but work inefficiently or contain errors	5-9
		Queries are partially created or incorrect	0-4
	Reports	Reports are created and accurately display query results and data	10-15
		Reports are created, but their content or format needs improvement	5-9
		Reports are missing or incorrect	0-4
	Comparative Analysis	The comparative analysis of antivirus programs is clear, logical, and well-founded	15-20
		The analysis is conducted, but with insufficient detail or errors	10-14
		The analysis is partially conducted or has significant errors	5-9
		The analysis is missing or completely incorrect	0-4
	Quality of Report Presentation	The report is clearly presented, includes all necessary elements, tables, or diagrams	5-10
		The presentation is generally good, but there are minor issues	3-4
		The presentation makes it difficult to understand the content of the report	0-2
SIW 2			
Form of Work	**Criterion**	**Description**	**Points (max 100)**
Report " Searching for information related to specialty on the Internet, using cloud services for data storage and data processing" (MS Word) (100 points)	Searching for Specialty-Related Information	Relevant information on current medical topics and educational resources is found	30-40
		Information is mostly relevant but has minor omissions	20-29
		Search is incomplete or contains minor errors	10-19
		Search is not done or is completely incorrect	0-9
	Using Cloud Services for Data Storage	Account is created, cloud collaboration is organized, and requirements are met	14-20
		Account is created but has minor issues in collaboration	7-13
		Cloud work is partially completed or has errors	0-6
	Using Cloud Services for Data Processing	Data analysis and visualization are done using Google Sheets	30-40
		Data analysis and visualization are done, but contain errors	20-29
		Data analysis is partial or has significant errors	10-19
		Data analysis is not done or is done incorrectly	0-9
SIW 3			
Video File (VideoPad, CapCut, Windows Movie Maker, etc.) (100 points)	Topic Choice and Research	Topic is current, research is thorough, and script is written	30-40
		Topic is chosen, but research or script needs improvement	20-29
		Topic is chosen, but research is superficial and script has errors	10-19
		Topic is not chosen or research and script are completely missing	0-9

	Creation of Storyboard	Storyboard is detailed and reflects the content of the video	14-20
		Storyboard is created but requires improvements	7-13
		Storyboard is partially done or does not reflect the content of the video	0-6
	Use of Video Editing Software	Video is edited professionally, with good quality recording and editing	30-40
		Video is edited with minor errors	20-29
		Video is edited, but quality of recording or editing is poor	10-19
		Video is not edited or edited poorly	0-9
	Quality of Video Report	Research is conducted but not all aspects are covered or there are gaps in the analysis	10-14
		Research is superficial or insufficiently detailed	5-9
		Research is not conducted or is poorly executed	0-4
		Video report is well-structured, professionally edited, and presents all research findings	15-20
		Video report is created but contains minor errors or lacks structure or editing quality	10-14
		Video report is created but has major errors or weak structure	5-9
		Video report is missing or poorly executed	0-4

Check List for midterm control

Computer testing	**Max 100**	**Min 50**
The testing is conducted on a computer.	90-100	Exellent
The test consists of 50 questions.	70-89	Good
Evaluation is carried out using a 100-point scale.	50-69	Satisfactory
The duration of the test is 50 min.	<50	Unsatisfactory

A multi-point system of knowledge assessment

Grading by letter system	Digital equivalent of points	Percentage	Assessment according to the traditional system
A	4,0	95-100	Exellent
A -	3,67	90-94	
B +	3,33	85-89	Good
B	3,0	80-84	
B -	2,67	75-79	
C +	2,33	70-74	
C	2,0	65-69	satisfactorily
C -	1,67	60-64	
D+	1,33	55-59	
D-	1,0	50-54	
FX	0,5	25-49	unsatisfactory
F	0	0-24	

11. Learning resources

Electronic databases

№	Title	Link
1	SKMA Electronic Library	https://e-lib.skma.edu.kz/genres
2	Republican Interuniversity Electronic Library	http://rmebrk.kz/
3	«Aknurpress» Digital Library	https://www.aknurpress.kz/
4	Electronic library "Epigraph"	http://www.elib.kz/

5	Epigraph - portal of multimedia textbooks	https://mbook.kz/ru/index/
6	Information and legal system "Zan"	https://zan.kz/ru
7	ЭБС IPR SMART	https://www.iprbookshop.ru/auth
8	Medline Ultimate EBSCO	https://surl.li/rcdthz
9	eBook Medical Collection EBSCO	https://surl.li/rcdthz
10	Scopus	https://www.scopus.com/

Electronic textbooks

1. Information and communication technology [Электронный ресурс]: учебное пособие/ М. Б. Сапрыгина, К.Ж. Кудабаев. - Электрон. текстовые дан. (20.2Мб). - Алматы: [s. n.], 2017. - 134 эл. опт. диск (CD-ROM) (на трех языках)
2. Қ.Ж. Құдабаев, А.С. Байділдаева, З.М. Абдримова, А.А. Мауленова, З.С. Халметов. «Информатикадан тест тапсырмаларының жинағы» Оқу-әдістемелік құрал.- Алматы, «Эверо» баспасы, 2020. 150 б. https://elib.kz/ru/search/read_book/2949/4. К.Ж.Кудабаев,
3. К.Ж. Кудабаев, З.С. Халметов, А.А. Мауленова, З.М. Абдримова, А.С.Байдилдаева. Учебно-методическое пособие «Сборник тестовых заданий по информатике».- Алматы, «Эверо», 2020г., 150 с. https://elib.kz/ru/search/read_book/2948/
4. Қ.Ж. Құдабаев. «Информатика» Оқу құралы. Алматы, «Эверо», 2020ж. 216б. https://elib.kz/ru/search/read_book/328/
5. Ricklefs V.P. Basics of Informatics: Educational manual for medical specialties of higher educational.– Almaty: Publishing house «Эверо», 2020.– 242p https://elib.kz/ru/search/read_book/363/
6. Нурпеисова Т.Б., Кайдаш И.Н. Қазіргі сандық әлемдегі информатика – Информатика в современном цифровом мире: оқу құралы. – Алматы: «Бастау», 2021. – 416 б. На двух языках. http://rmebrk.kz/book/1177090
7. Urmashev B.A. Information-communication technology: Textbook/ Ministry of education and science of the Republic of Kazakhstan, Association of higher educational institutions of Kazakhstan.- Almaty: Bookprint, 2016.- 413 p. http://rmebrk.kz/book/1165091
8. Polyakov, M. V. Intelligent data analysis in medicine: study aid / M.V. Polyakov.- Москва: Ай Пи Ар Медиа, 2024.- 73 c. // IPR SMART: https://www.iprbookshop.ru/135229.html
9. Интеллектуальные информационные технологии в управлении биомедицинским оборудованием: уч. пособие / Н.В. [и др.]; под редакцией Л.В. Черкесовой. Ростов-на-Дону: ДГТУ, 2022.- 142 с.// IPR SMART: https://www.iprbookshop.ru/130404.html
10. Голиков А.М. Цифрлық байланыс жүйелеріндегі ақпаратты қорғау: оқулық / А.М. Голиков.- Алматы, Москва: EDP Hub, Ай Пи Ар Медиа, 2024.- 286 с. // IPR SMART: https://www.iprbookshop.ru/138445.html
11. Баймулдина Н.С. Компьютерлік графика негіздері: оқу құралы / Н.С. Баймулдина.- Алматы, Москва: EDP Hub, АйПиАрМедиа, 2024. // IPR SMART: https://www.iprbookshop.ru/141467.html
12. Поляков М. В. Медицинадағы деректерді өндіру: оқу құралы.- Алматы, Москва: EDP Hub, Ай Пи Ар Медиа, 2024.- 85 с. // IPR SMART: https://www.iprbookshop.ru/135262.html
13. Кокорин В.Н. Цифровые двойники биосистемы человека как механизм искусственного интеллекта в здравоохранении.- Ульяновск: УлГТУ, 2023.- 92 с.-//IPR SMART: https://www.iprbookshop.ru/149310.html
14. Christian Bohm;Claudia Plant. Database Technology For Life Sciences And Medicine/ Science, Engineering, and Biology Informatics.- Singapore : World Scientific, 2010 // eBook Medical Collection EBSCO
15. G.J.E. De Moor. Transatlantic Cooperation Surrounding Health Related Information and Communication Technology.- Amsterdam: IOS Press. 2011. // eBook Medical Collection EBSCO
16. K.L. Courtney, O. Shabestari, A. Kuo. Enabling Health and Healthcare Through ICT: Available, Tailored and Closer.- Amsterdam : SAGE Publications Ltd.- 2013. // eBook Medical Collection EBSCO

Laboratory physical resources

- Desktop computers;
- Networking equipment;
- Storage devices;
- Whiteboard;
- Projector;
- Mobile devices (tablets and smattphones).

Software

- Microsoft Office (Word, Excel, Access, Power point);
- Lucidchart tool;
- Tild website bilder;
- Canva tool;
- Strike Network Diagram tool;
- VideoPad, CapCut, Windows Movie Maker, etc.;
- AI tools;
- STATISTICA

Main Literature

1. Нурпеисова Т. Б. Информационно-коммуникационные технологии: учеб. пособие.-2017
2. Хакимова Т. Практикум по курсу "Основы информатики": уч. пос. - Алматы: "NURPRESS".-201
3. Urmashev B.A. Information-communication technology: Textbook /B.A. Urmashev.-Almaty: Association of higher educational instutions of Kazakhstan, 2016
4. Koshimbaev Sh.K. Automation of standard technological processes [Text]: textbook / Sh.K.Koshimbaev, B.A. Suleimenov.-Almaty:[s.n.], 2016.- 266p.
5. Manapov N.T. Computer chemistry [Текст] : textbook/ N.T. Manapov.- Almaty: Association of higher educational institutions of Kazakhstan, 2016. - 312 p
6. Methods of teaching computer science Textbook / E. Bidaibekov [and etc.].- Almaty:[s.n.], 2016.- 359 p.
7. Nurpeisova T.B. Information andCommunication Technologies: Text-book / T.B. Nurpeisova, I.N. Kaidash.- Almaty: Bastau, 2017.- 480 p.

Additional Literature

1. Қойбағарова Т.Қ. Информатика: оқу-әдістемелік құралы – Түзет.,толықт.2-бас. - Алматы: Эверо.- 2014,325 бет.
2. Информатикадан тест тапсырмаларының жинағы: оқу-әдістемелік құрал- Алматы: Эверо.-2014
3. Сборник тестовых заданий по информатике: учеб.-методическое пособие / К. Ж. Кудабаев [и др.].- Рек. решением учеб.-метод. совета ЮКГФА.- Алматы: Эверо, 2014.- 114 с.

12. Course Policy and Requirements

1. Attendance: Regular attendance is mandatory. Students must attend at least 80% of the classes to qualify for the final examination. Participation in all scheduled activities, including practical tasks and SIWs is essential.

2. Assignments and Projects: All assignments and projects must be submitted on time. Late submissions will incur penalties unless prior arrangements have been made with the instructor. Assignments must meet the specified criteria and be submitted in the required format.

3. Examinations and Assessments: Two midterm assessments will be conducted during the semester, on the seventh and fourteenth weeks, respectively. Passing these midterm assessments is mandatory for eligibility to sit for the final exam. The results of the midterm assessments will be sent to the Dean's Office in the form of a report at the end of the assessment week. Both midterm controls will be conducted under strict examination conditions, and any form of academic dishonesty will result in severe consequences.

4. Grading Policy: The final exam grade will be calculated as the sum of the current assessment grade and the final exam grade. The current assessment includes grades for each practical class, completion of student independent work, and results of midterm controls, accounting for 60% of the overall grade. The final exam

accounts for 40% of the overall grade. To pass the course, students must achieve a minimum overall score of 50%.

5. Communication: Students should regularly check the course's online platform (Platonus, Whatsapp chat) for announcements, assignment details, and other important information. Queries and communications should be directed through the official communication channels provided by the instructor.

6. Academic Integrity: Students are expected to uphold the highest standards of academic integrity. Plagiarism, cheating, and other forms of academic dishonesty will not be tolerated and will result in disciplinary action.

7. Technology Requirements: Students must have access to a computer with the necessary software installed. Reliable internet access is also required for completing online assignments and participating in virtual classes.

8. Behavioral Requirements: Students are expected to show respect and courtesy towards both the instructor and their classmates. Tolerance and appropriate behavior in the learning environment are required. Medical students must wear white coats and medical caps during classes.

9. Support and Resources: If you encounter difficulties with the course content or assignments, seek help early. Resources such as office hours, tutoring sessions.

13. Academic policy based on the moral and ethical values of the academy

https://surl.li/hgqivx

14. Approval, ratification and revision

Date of Approval	Protocol	Head of the LIC	signature
«04» 06 2025 y.	№ 7	Darbicheva R. I.	
Date of Ratification	**Protocol**	**Head of the Department**	
«28» 05 2025 y.	№ 12A	Ivanova M.B.	
Date of Approval of GE AC	**Protocol**	**Chair of the AC**	
«13» 06 2025 y.	№ 11	Nurzhanbayeva Zh.O.	
Date of Revision	**Protocol**	**Head of the Department**	
«____»____202__ y.	№ ___		
Date of Revision of GE AC	**Protocol**	**Chair of the AC**	
«____»____202__ y.	№ ___		
.			