Non-commercial joint-stock company
«Kazakh National Agrarian Research University»

AGREED
Deputy General Director of the Institute of Information and Computational Technologies of the CS of the Ministry of Science and Higher Education of the RK, PhD, associate professor
_____ O.Mamyrbayev
«01» 03 2024 y.

APPROVED
Chairman of the Board - Rector
_____ A.Kurishbaev
«01» 03 2024 y.

AGREED
Director of the RSE branch on PVC "Computer Information Center of the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan" in Almaty
_____ E.Iemberdiev
«01» 03 2024 y.

EDUCATIONAL PROGRAM

«6B06103 - Computer Systems and Software Engineering »

Awarded degree: bachelor of Science in Information and Communication Technologies under the educational programme «6B06103 - Computer Systems and Software Engineering»

Almaty, 2024

Approved at the meeting of the Department " IT technology and automation "
Protocol No. 6 « 25 » 01 2024 y.
Head of the department _____ E.Amanbayeva

Considered at meetings Academic Committee of the Faculty of «Engineering-technical»
Protocol № 6 « 26 » 01 2024 y.
Chairman of the AC of the faculty _____ U.Ibishev

Reviewed by the Educational Methodological Council of the University and recommended to the Academic Council
Protocol № 4 « 01 » 02 2024 y.
Chairman of the EMC of the University _____ A. Abdyrov

The educational program was approved at the meeting of the Academic Council of KazNARU
Protocol № 9, « 01 » 03 2024 y.

Developers:

P.d. head of the department — L. Aldibayeva

Head of department
Candidate of Physical and Mathematical Sciences, Professor — E. Amanbayeva

B. Kirgizbayeva

Student: VT-22-12к
Graduate of 2022
E.Onalbay
M. Amit

Employer:
Deputy General Director of the Institute of Information and Computational Technologies of the CS of the Ministry of Science and Higher Education of the RK, PhD, associate professor — O .Mamyrbayev

Head of the laboratory "Automation and Information Technologies" LLP "Research and Production Center of Agroengineering", Professor, Doctor of Technical Sciences — A .Altybayev

Agreed:

Head of the Educational Program Design Office — Zh. Kussainova

Application area

The educational program 6B06103-«Computer systems and software» in NCJSC «Kazakh National Agrarian Research University» is designed to form a comprehensive and professional competence of bachelor students.

Regulations

«On Education» The Law of the Republic of Kazakhstan dated 27 July, 2007 No. 319-III;

Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 №2;

Classifier of training programs for personnel with higher and post-graduate education. Order of the Minister of Education and Science of the Republic of Kazakhstan of October 13, 2018 No. 569;

Standard Rules for the activities of educational organizations implementing educational programs of higher and (or) postgraduate education. Order of the Minister of Education and Science of the Republic of Kazakhstan of October 30, 2018 No. 595;

Rules of the organization of the educational process on credit technology of training. Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 12, 2018 No. 563;

Algorithm of inclusion and exclusion of educational programs in the Register of educational programs of higher and postgraduate education. Order of the Minister of Education and Science of the Republic of Kazakhstan No. 665 dated December 4, 2018;

Order No. 106 of the Minister of Science and Higher Education of the Republic of Kazakhstan dated October 12, 2022. Rules for keeping the register of educational programs, implemented by the organizations of higher and (or) postgraduate education, as well as the grounds for inclusion in the register of educational programs and exclusion from it.

Professional standard. Appendix No. 72 to the order of the Deputy Chairman of the Board of the National chamber of entrepreneurs of the Republic of Kazakhstan "Atameken" dated 11.12.2018 No. 339

Professional standard:

1.Software development, Appendix No. 7 to the order of the Acting Chairman of the Board of the National Chamber of Entrepreneurs Republic of Kazakhstan “Atameken” No. 222 dated 12/05/2022;

2. Providing software support. Appendix No. 5 to the order of the Acting Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan “Atameken” No. 222 dated December 5, 2022.

3. Computer systems infrastructure. Appendix No. 14 to the order of the Acting Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan “Atameken” No. 222 dated December 5, 2022.

1. Passport of the educational program

Code and classification of the field of education	6B06 Information and communication technology
Code and classification of training areas	6B061 Information and communication technology
Code and name of educational program	«6B06103 - Computer Systems and Software Engineering»
Type of educational program	Current
The purpose of the educational program	Training competitive in the labor market specialists in computer technology and software, with high personal characteristics and broad fundamental and applied knowledge in the field of information and communication technologies.
Level according to (I S C E)	6
LevelaccordingtoNQF	6
LevelaccordingtoSQF	6
The number of applications for licenses for the training	№ KZ89LAA00031870 from 05 August 2021 y. №639
Accreditation of EP The name of the accreditation body The period of validity of accreditation	Accreditation Certificate № 2022 KE 0525 KAZSEE 27.05.2022 -26.05.2027 y.
Degreea warded	Bachelor in Information and Communication Technology according to the educational program «6B06103 - Computer Systems and Software Engineering »
Learning outcome	Table 2
List of qualifications and positions	1) Software Designer 2) System and network administration specialist (network administrator);
Professional field of activity	The professional field of graduates are the departments of state bodies (ministries, akimats, as well as their regional structures and divisions); national and private domestic, foreign companies, factories and factories, educational and scientific centers, departments of culture and health, agriculture, as well as computer companies whose work are based on IT technology.
Field and object of professional activity	The objects of professional activity are public and private companies or their departments using: - computers, complexes, systems and networks; - computer systems for information processing and management; - computer-aided design systems; - software of computer equipment and information systems (programs, software systems and systems).
Functions of professional activity	1) Preparation of the software development process, Software requirements analysis, Software design, Software programming and testing, Integration of software modules and software components. 2) Design, installation and maintenance of the organization's LAN; Equipment, installation, configuration

	and maintenance of server equipment of the organization; Installation, configuration and maintenance of video surveillance systems, organization's access control systems; Ensuring system security of the organization.
Types of professional activity	**1. Estimated:** • Conduct a software performance assessment. • Evaluation of software code for compliance with the required quality criteria **2. Constructive:** • Development and implementation of procedures for assembling software modules and software components. • Development of procedures for the migration and conversion (conversion) of data • Typical database design, development and optimization of complex SQL queries. • Selection and use of suitable ORM-systems. • Development of functionality for working with the database. **3. Information technology:** • Principles of designing database schemas, optimizing queries, storing and reading data from a DBMS (transactions, isolation levels, indices). • ORM-system. • Approaches to the integration of software modules and software components. • The principles of operation and functionality of the OS. • Methods and tools for assembling software modules and software components. • Methods and tools for testing software performance. • Languages, utilities and programming environments
Have skills	The ability to understand the current trends in the development of computer technology and the ways of their use in research, design, production, technological, organizational and management activities; - The basic principles of the organization of the user interface with the software system; - in the methods of analysis, research and modeling of computing and information processes related to the functioning of objects of professional activity and their components; - in the principles, methods and ways of integrating hardware and software when creating computing systems, complexes and networks; - in the methods and means of ensuring information security of objects of professional activity; - in the methods and means of protecting intellectual property; - in economic-organizational and legal issues of labor organization, production organization and scientific research; - in the rules and norms of labor protection and life safety.

2. Learning outcomes for EP

Codes	Learning outcomes
LO1	Demonstrate knowledge and understanding of natural science disciplines and scientific research
LO2	Apply financial, economic laws and business principles, labor safety and environmental standards, understand the importance of the principles and culture of academic integrity, scientific research and legal action against corruption.
LO3	Collect and interpret the principles of organization and operation of components of hardware-software systems and networks, prepare for maintenance and technical support of software, support software users..
LO4	Select modern methods for constructing and analyzing algorithms, preparing the development process and analyzing software requirements, applying the basic principles of design and software programming.
LO5	Apply knowledge and understanding of facts, phenomena in the principles of designing database schemas, theories and complex dependencies between optimizing queries, storing and reading data from a DBMS, requirements for server hardware and software, the operation of Internet technologies and information security.
LO6	Debug program code, test and analyze the performance of software source code, implement tasks in programming languages and use them in procedures for assembling program modules and software components.
LO7	Apply knowledge and understanding of critical analysis and condition testing of computer, server equipment and peripheral devices, design of an organization's IT infrastructure and its implementation.
LO8	Evaluate the performance of the software and information security measures for their use in project management of the organization’s IT infrastructure and in the functionality for working with the database
LO9	Solve problems and apply skills in learning programming languages, analyzing problems and software changes, transferring software to a new environment and decommissioning software, managing the development of a support service.
LO10	Operate computer, server equipment and peripheral devices in accordance with technical conditions and service standards
LO11	Apply theoretical and practical knowledge to develop design and operational documentation for software development.

3. Content of the educational program

№ пп	RC/UC/CC	Code of the discipline	Name of the discipline that forms competencies	In academic credits	Volume in hours							Distribution of credits by course and semester								Department[1]	Form of control
					In academic hours	Auditory				Extracurricular		1 course		2 course		3 course		4 course			
						Lectures	Practical classes	Laboratory classes	Other (practice)	SIWT	SIW	1	2	3	4	5	6	7	8		
	ЖБП/ООД GED	**Жалпы білім беру пәндерінің циклы /Цикл общеобразовательных дисциплин/ Cycle of general education disciplines**		**56**	**1680**	**84**	**636**			**240**	**720**	**17**	**25**	**7**	**7**						
		Модуль 1. Гуманитарлық ғылымдар және тілдер/ Гуманитарный и языковой/ Module 1. Humanities and languages		**30**	**900**	**30**	**270**			**150**	**450**	**15**	**10**	**5**							
1	МК / ОК /RC	KTM /IKG / HKS 1101	Қазақстан тарихы (МЕ) /История Казахстана (ГЭ)/ History of Kazakhstan (SEC)	5	150	15	30	-		30	75	5								29	State exam
2	МК / ОК /RC	Fil / Fil / Phil 2102	Философия/ Философия/ Philosophy	5	150	15	30	-		30	75			5						29	Exam

3	МК / ОК /RC	SHT / IYa / FL 1103-1108	Шет тілі/ Иностранный язык/ Foreign language	10	300		90	-		60	150	5	5							14	exam
4	МК / ОК /RC	KOT /K(R) Ya / K(R)L 1104-1110	Қазақ (Орыс) тілі/ Казахский (Русский) язык / Kazakh (Russian) language	10	300		90	-		60	150	5	5							15	Exam
		Модуль 2. Кәсіби және коммуникативті Модуль 2. Профессионально-коммуникативный/ Module 2. Professional and communicative		**10**	**300**	**30**	**60**			**60**	**150**	**5**	**5**								
5	МК / ОК /RC	AKT/ IKT / ICT 1105	Ақпараттық-коммуникациялық технологиялар / Информационно-коммуникационные технологии / Information and communication technology	5	150	15	30	-		30	75		5							9	Exam
6	ТК/ КВ/ CC	KSZhKM /PAK/ LACC 1113	Құқық және сыбайлас жемқорлыққа қарсы мәдениет /Право и антикоррупционная культура/ Law and anti-corruption culture	5	150	15	30	-		30	75	5								3	Exam
		Eko/ Eko/ Eko	Экономика/ Экономика/ Economy																	2	

		1114																			
		Ekol/ Ekol/ Ekol 1115	Экология/ Экология//Ecology																	17	
		TAK/ BZh/ LS 1116	Тіршілік әрекетінің қауіпсіздігі/ Безопасность жизнедеятельности/ Life safety																	7	
		Kas/Pre/Ent 1117	Кәсіпкерлік/Предпринимательство/ Entrepreneurship																		
		GZN/ONI/ FSR 1118	Ғылыми зерттеулердің негіздері/ Основы научных исследований/ Fundamentals of scientific research																		
		KSN/OFG/BFL1119	Қаржылық сауаттылық негіздері /Основы финансовой грамотности/ Basics of financial literacy																		
		Модуль 3. Қоғамдық-саяси білім және салауатты өмір салты Модуль 3. Социально-политических знаний и здоровый образ жизни/ Module 3. Socio-political knowledge and a healthy lifestyle		16	**480**	**24**	**296**	**0**		**40**	**120**	**2**	**10**	**2**	**2**						
7	МК / ОК /RC	ASBM ASMP / MSPZ	Әлеуметтік-саясаттану білім модулі (әлеуметтану,		8	240	30	45			60	105		8						29	Exam

		SPKP / SPKM (SPCP) 1106	саясаттану, мәдениеттану, психология)/ Модуль социально-политических знаний (социология, политология, культурология, психология)/ Social and political knowledge module (Social Studies,Political Studies, bbCultural Studies, Psychology)																		
8	МК / ОК /RC	DSH / FK/ PhC 1107, 1109, 2111, 2112	Дене шынықтыру/ Физическая культура / Physical culture	8	240		120			120		2	2	2	2					30	Exam
	БП / БД/ BD	**Базалық пәндер циклы / Цикл базовых дисциплин/ Cycle of basic disciplines**		**115**	**3450**	**309**	**401**	**320**	**120**	**515**	**1785**	**14**	**6**	**23**	**24**	**25**	**18**				
		Модуль4.Жаратылыс-ғылымдық дайындық/Модуль 4. Естественно-научная подготовка / Module 4 Natural Science Training		**15**	**450**	**45**	**75**	**15**		**90**	**225**	**5**	**5**	**5**							
9	ЖК ВК/ UC	М/ М/ М 1201	Математика 1 / Математика 1 / Mathematics 1	5	150	15	30		-	30	75	5								9	Exam

10	ЖК ВК/ UC	Fiz/Fiz /Phys 2203	Физика/Физика/ Physics	5	150	15	15	15	-	30	75			5						9	Exam
11	ЖК ВК/ UC	M/ M2/ M 1202	Математика2/ Математика2/ Mathematics 2	5	150	15	30	-	-	30	75		5							9	Exam
		Модуль 5. Базалық бағдарламалау. /Модуль 5. Базовое программирование/ Module 5. Basic programming		**17**	**510**	**45**	**45**	**60**	**20**	**75**	**265**	**4**	**2**	**6**	**5**						
12	ЖК ВК/ UC	DKB/ SDP/ DSP 1204	Деректер құрылымы және бағдарламалау/ Структуры данных и программирование/ Data structures and programming	5	150	15		30		30	75	5								9	Exam
13	ТК/ КВ/ СС	ОВР/ ООР/ OOP 2211	Объектілі-бағытталған программалау / Объектно-ориентированное программирование/ Object-oriented programming	5	150	15	15	15		30	75			5						9	Exam
		C#ТВ/ PC#/ C#P 2235	C# тілінде бағдарламалау/ Программирование на C # / C# Programming																		
14	ЖК ВК/ UC	PBTK Zh/PP YaPP/ DAPP	Python бағдарламалау тілінде қосымшаларды жобалау / Проектирование	5	150	15	30			30	75				5					9	Exam

		L 2205	приложений на языке программирования Python / Designing applications in the Python programming language																		
15	ЖК ВК/ UC	OP/UP/ EP 1206	Оқу практикасы/ Учебная практика/ Training practice	2	60				20		40		2							9	Report
		Модуль 6. Компьютерлік жүйелердің негіздері /Модуль 6. Основы компьютерных систем/ Module 6. Basics of computer systems		**32**	**960**	**84**	**84**	**112**	**40**	**140**	**500**			**12**	**20**						
16	ЖК ВК/ UC	CSD/ DCS/ DCD 2208	Цифрлық сұлбалар дизайны/Дизайн цифровых схем/Digital circuit design	5	150	15	15	15		30	75				5					9	Exam
17	ЖК ВК/ UC	KUA/ KOYaA/ COA 2209	Компьютерді ұйымдастыру және ассемблер/ Компьютерная организация и ассемблер/ Computer organization and assembler	6	180	15	15	30		30	90			6						9	Exam
18	ТК/ КВ/ СС	OZhD /DOS / OSD 2213	Операциялық жүйе дизайны/ Дизайн операционной системы/ Operating system design/	5	150	15	15	15		30	75				5					9	Exam
		ZNZh /NSSP/	Заманауи нейрондық желілер/ Нейронные сети в современном																		

		NNMV 2214	представлении/ Neural networks in the modern view																		
19	ТК/ КВ/ СС	IGZh/ IGS/ IGS 2215	Интерактивті графикалық жүйелер/Интерактивные графические системы/ Interactive graphic systems	5	150	15	15	15		30	75				5					9	Exam
		AKSA/MKSI/ ECM 2216	Ақпаратты кодтау және сығу әдістері/ Методы кодирования и сжатия информации/ Encoding and compression methods																		
20	ТК/ КВ/ СС	WB/WP/ WP 2217	Web -бағдарламалау / Web-программирование / Web programming	5	150	15	15	15		30	75			5						9	Exam
		HTMLTSK/ RSYaHTML/ HTMLWD 2218	HTML тілінде сайттарды құру/ Разработка сайтов на языке HTML/ HTML website development																		
21	ЖКВК/ UC	OP/ PP/PI 2207	Өндірістік **практика** / **Производственная практика/** Production practice	5	150				50		100ц				5					9	Report
		Модуль 7. Технологиялық дайындық және бизнес басқару/Модуль7. Технологическая подготовка и бизнес-		**25**	**750**	**75**	**95**	**80**		**125**	**375**					**25**					

		управление/ Module 7. Technology training and business management																			
22	ТК/ КВ/ CC	ZhMBK/ PSMS/ SMS 3219	Жүйені модельдеудің бағдарламалық құралдары / Программные средства моделирования систем/ System modeling software	5	150	15	15	15		30	75					5				9	Exam
		ZhTSHKT / SATPR/ SADT 3220	Жүйелік талдау және шешімдерді қабылдау теориясы/ Системный анализ и теория принятия решений Systems analysis and decision theory																		
23	ТК/ КВ/ CC	DM/ DM/DM 3221	3D –модельдеу/3D – моделирование/3D modeling	5	150	15	15	15		30	75					5				9	Exam
		KZhID / DIKS/ CSID 3222	Компьютерлік жүйелердің интерфейстерінің дизайны /Дизайн интерфейсов компьютерных систем/ Computer Systems Interface Design																		
24	ВК	AE / AE / AE 3233	Аграрлық экономика/ Аграрная экономика/ Agrarian Economy	5	150	15	30			30	75					5				2	Exam

25	ТК/ КВ/ СС	JB/PJ/ PJ 3224	Java-да бағдарламалау/Программирование на Java/ Java programming	6	180	15	15	30		30	90					6				9	Exam
		ST/ TS/ ST 3224	Скриптер – технологиясы / Технология скриптов/ Script Technology																		
26	ТК/ КВ/ СС	KZhK/ KSB/ CSS 3225	Компьютерлік жүйелер қауіпсіздігі /Компьютерная система безопасности/Compute r security system	5	150	15	15	15		3 0	75					5				9	Exam
		KZhK/ KBS/ CNS 3226	Криптография және желілердің қауіпсіздігі/ Криптография и безопасность сетей/ Cryptography and network security																		
		Модуль 8. Деректер қоры және басқару жүйелер / Модуль 8. Базы данных и системы управления/ Module 8. Databases and management systems		**28**	**840**	**66**	**86**	**68**	**60**	**110**	**450**				**5**	**5**	**18**				
27	ТК/ КВ/ СС	MB/ MP/M P 3227	Мобильдік бағдарламалау /Мобильное программирование/M obile programming	6	180	15	15	30		30	90						6			9	Exam
		IMK AKK	IOS-та мобильді құрылғыларға																		

		/RPD MUI/ DMAI 3228	арналған қосымшаларды құру/ Разработка приложений для мобильных устройств на IOS/ Developing mobile applications on IOS																		
28	ТК/ КВ/ СС	DKBZh/CBDZ/ DKS 2229	Деректер қоры мен білім жүйелері/ Системы баз данных и знаний/Database and knowledge systems	5	150	15	15	15		30	75				5				9	Exam
		BMA/ MMU/ MMM 2230	Басқару модельдері мен әдістері /Модели и методы управления/ Management models and methods																		
29	ЖК ВК/ UC	II / II/ II 3210	IT- инфрақұрылымы /IT -инфраструктура /IT-infrastructure	5	150	15	30			30	75					5			9	Exam
30	ТК/ КВ/ СС	UUAMB/PMBLA/PMUAV 3334	Ұшқышсыз ұшатын аппараттардың микрокомпьютерлерін бағдарламалау / Программирование микрокомпьютеров беспилотных летательных аппаратов/Programming microcomputers of unmanned aerial vehicles	6	180	15	15	30		30	90						6		9	Exam

		RZhK /RRS/ DRS 3332	Роботталған жүйелерді құру/ Разработка роботизированной системы/ Development of a robotic system																		
31	ЖК ВК/ UC	OP/ PP/ PI 3303	Өндірістік практика /Производственная практика/ Production practice	5	150				50		100						5			9	Report
	КП/ ПД/ MD	**Кәсіптік пәндер циклы / Цикл профилирующих дисциплин/ Cycle of majors disciplines**		**60**	**1800**	**156**	**180**	**184**	**80**	**260**	**940**						**12**	**31**	**17**		
		Модуль 9. БҚ құрастыру негіздері /Модуль 9. Основы создания ПО/ Module 9. Fundamentals of software development		**11**	**330**	**33**	**33**	**44**		**55**	**165**						**6**	**5**			
32	ЖК ВК/ UC	BKA/ APO/ SA 3301	Бағдарламалық қамтаманың архитектурасы/Архитектура программного обеспечения/Software Architecture	6	180	15	15	30		30	90						6			9	Exam
33	ЖК ВК/ UC	BI/PI/ SE 4302	Бағдарламалық инженерия /Программная инженерия /Software engineering	6	180	15	15	30		30	90							6		9	Exam
		Модуль 10. Компьютерлік жүйелерді зерттеу /Модуль 10. Исследование компьютерных систем.		**18**	**540**	**54**	**78**	**48**		**90**	**270**								**18**		

		Module 10. Computer Systems Research																		
34	ТК/ КВ/ CC	KSKZh/ PKSP / DCSA 4305	Клиент-серверлік қосымшаларды жобалау / Проектирование клиент-серверных приложений/ Design of client-server applications	6	180	15	15	30		30	90								6	9	Exam
		UKDT / ABD/ BDA 4306	Үлкен көлемді деректерді талдау Аналитика больших данных/ Big data analytics																	
35	ТК/ КВ/ CC	ASO/ COI/ DPI 4310	Ақпаратты сандық өңдеу/Цифровая обработка информации/Digital processing of information	6	180	15	15	30		30	90								6	9	Exam
		ODA/ ODA/ ODA 4308	Oracle Database әкімшілеу/Oracle Database администрирование/ Oracle Database Administration																	
36	ТК/ КВ/ CC	APZhM/MIPS/ MIPS 4309	Ақпараттық процесстерді және жүйелерді модельдеу /Моделирование информационных процессов и систем/Modeling of	6	180	15	15	30		30	90								6	9	Exam

			information processes and systems																		
		ASHO ZhM / MPSHP/ MAPP 4319	Ауыл шаруашылығы өндірісін жоспарлаудағы модельдеу / Моделирование в планировании с/х производства/ Modeling in agricultural production planning																		
		Модуль 11. Компьютерлік жүйелерді зерттеу / Модуль 11. Телекоммуникационные сети и прикладное программирование/ Module 11. Telecommunication networks and application programming		**35**	**1050**	**81**	**81**	**108**	**80**	**135**	**465**						**6**	**25**	**4**		
37	ТК/ КВ/ CC	KZh/ KS/CN 3310	Компьютерлік желілер/Компьютерные сети/Computer networks	6	180	15	15	30		30	90						6			9	Exam н
		ZhZhA / ASC/ SNA 3311	Жүйелер мен желілерді әкімшілеу/ Администрирование систем и сетей/ System and network administration																		
		BB/BP/BP 4316	Блокты бағдарламалау / Блочное программирование/ Block programming																		

38	ТК/ КВ/ CC	PTB/ PP/ PPHP 4312	PHP тілінде бағдарламалау / Программирование на PHP/ Programming in PHP	5	150	15	15	15		30	75							5		9	Exam
39	ТК/ КВ/ CC	FNW KA/ RWP OF/ FBW AD 4317	Framework негізіндегі web -қосымшаларды әзірлеу/ Разработка web приложения на основе Framework/ Framework based web application development	6	180	15	15	30		30	90							6		9	Exam
		WKA /AWS /WSA 4333	Web -қызметтерді әкімшілеу / Администрирование Web-сервисов/ Administration of Web services																		
40	ТК/ КВ/ CC	BET/ TOV/ CCT 4313	Бұлтты есептеу технологиясы/Технология облачных вычислений/ Cloud computing technology	6	180	15	15	30		30	90							6		9	Exam
		TET / TRV/ DCT 4313	Таратылған есептеулер технологиясы / Технология распределенных вычислений/ Distributed computing technology																		

41	ТК/ КВ/ CC	ZhP/PP/DP 4314	Жобалау паттерндері / Паттерны проектирования / Design patterns	6	180	15	15	30		30	90							6		9	Exam
		BKZhB/ UPPO/ SPM 4314	Бағдарламалық қамсыздандыру жобаларын басқару / Управление проектами программного обеспечения / Software project management																		
42	ЖК ВК/ UC	KP / PP/ PI 4304	Кәсібі практика / Профессиональная практика/ Proffessional practice	5	150				50		100								5	9	Report
		ИА	**Қорытынды аттестаттау / Итоговая аттестация/ Final assessment:**	**8**	**240**				**80**		**160**								**8**		
			Қорытынды аттестаттау /Итоговая аттестация/ Final assessment:	8	240				80		160								8	9	
			Итого/ Total	**244**	**7320**	**531**	**1325**	**484**	**320**	**1060**	**3685**	**32**	**32**	**28**	**32**	**31**	**29**	**29**	**31**		

[1] **Note:**

Number of the department	**Short name**	Name of the department
1	AAaF	Accounting Audit and Finance
2	MaOA	Management and organization of agribusiness
3	Law	Law
4	WRaLI	Water resources and land improvement
5	MU	"Machine use" named after I.V. Sakharov
6	PE	Professional education
7	MaDAE	Mechanics and design of agricultural equipment
8	AmaT	Agricultural machinery and technology
9	ITA	IT technology and automation
10	ESaA	Energy Saving and Automation
11	LRaC	Land Resources and Cadastre
12	FRaHM	Forest resources and hunting management
13	PPaQ	Plant Protection and Quarantine
14	FL	Foreign languages
15	KaRL	Kazakh and Russian languages
16	SSaA	Soil science and agrochemistry
17	Ecology	Ecology
18	HaWG	Horticulture and walnut growing
19	Agr	Agronomy
20	BS	Biological safety
21	CVM	Clinical Veterinary Medicine
22	OSaBR	Obstetrics, Surgery and Biotechnology Reproduction
23	MaNV	Microbiology and non-virology
24	VSEaH	Veterinary-sanitary examination and hygiene
25	FTaS	Food Technology and Safety
26	BPFaF	Beekeeping, poultry farming and fisheries
27	TLP	Technology of livestock production
28	PMaB	"Physiology, morphology and biochemistry" them. BUT. Bazanova
29	THKaTC	The history of Kazakhstan and the culture of the peoples of Kazakhstan
30	PEaS	Physical education and sport
31	MD	Military Department

4. Modules Competency Map

Codes	Module	Educational competence	Learning outcomes
MC1	**Cycle of general education disciple nes**	aimed at the formation of fundamental source and historiographic materials, as well as for the achievement of modern historical science of Kazakhstan; to determine the role of the history of Kazakhstan in the system of humanitarian knowledge; on revealing the specifics of the object and subject of history of Kazakhstan for the analysis of topical problems of the modern stage of development; on creation of scientifically grounded concept of history of Kazakhstan based on integral and objective coverage of the main stages of ethnogenesis of the Kazakh people, evolution of forms of statehood and civilization in the Great Steppe; on systematization of knowledge of the main events of the modern history of Kazakhstan.	- demonstrate knowledge and understanding of the main stages of development of the history of Kazakhstan - correlate the phenomena and events of the historical past with the general paradigm of world-historical development of human society through critical analysis; - possess the skills of analytical and axiological analysis in the study of historical processes and phenomena of modern Kazakhstan - be able to comprehend objectively and comprehensively the immanent features of the modern Kazakhstan model of development - to systematize and give a critical assessment of historical phenomena and processes in the history of Kazakhstan.
MC2		form a system of general competencies that ensure the socio-cultural development of the personality of the future specialist based on the formation of his ideological, civic and moral positions;	- to evaluate the surrounding reality on the basis of ideological positions, formed by the knowledge of the fundamentals of philosophy, which provide scientific understanding and study of the natural and social world by methods of scientific and philosophical knowledge; - to interpret the content and specific features of the mythological, religious and scientific worldview; - to give assessment to everything happening in the social and industrial spheres;
MC3		develop the ability to interpersonal social and professional communication in the state, Russian and foreign languages;	- implement the use of language and speech tools based on a system of grammatical knowledge; analyze information in accordance with the situation of communication; - to carry out the use of linguistic and speech means based on the system of grammatical knowledge; analyze information in accordance with the communication situation;
MC4	**Module. Professional and communicative**	The development of information literacy through the mastery and the use of modern information and communication technologies in all areas of life and work;	- evaluate the actvities and actions of communication participants. - to use in personal activities various types of information and communication technologies: Internet resources, cloud and mobile services for searching, storing, processing, protecting and distributing information;

MC5		Have an intolerant attitude toward corrupt behavior, respectful of legislation and law.	- analyze events and actions from the point of view of the area of legal regulation and be able to refer to the necessary regulatory acts; - to be guided in the current legislation; using the law, to protect their rights and interests, - to carry out professional activities on the basis of a developed legal awareness, legal thinking and legal culture; - to acquire a sufficient level of legal awareness; - be able to assess the facts and phenomena of professional activity from an ethical point of view; - apply moral rules and norms of behavior in specific life situations
MC6		Be competent to analyze and obtain information in accordance with the basic knowledge of the economy; use the basics of economic knowledge in various fields;able to apply this knowledge in solving situational and practical problems.	- to know the fundamental problems of the functioning of the economy, the mechanism of action and manifestation of economic laws, as well as the main features of the leading schools and areas of economic science; - to be aware of economic terms and categories, use them in their educational activities; - to understand and know the main events of the world and domestic economic history, the course of ongoing reforms in the light of the strategy "Kazakhstan - 2050", development trends in the field of modern business; - to distinguish and compare the behavior of market agents in different types of market structures; - to explain the interaction of economic agents in macroeconomic markets; - to compare the impact of macroeconomic policies in different countries; - to argue their own views on modern macroeconomic phenomena; - to use the knowledge gained in practice to assess the results of economic reforms in Kazakhstan
MC7		To be competent in the application of methods for the implementation of low-waste production and the assessment of the environmental efficiency of economic activity.	- know the contents of the basic terms in the field of ecology, environmental management; modern global and regional environmental problems and their solutions; - be able to apply environmental knowledge to solve and predict possible environmental problems; - apply methods for the implementation of low-waste production and assess the environmental performance of economic activity.

			- establish causal relationships between phenomena occurring in nature and society, - apply environmental knowledge to solve and predict possible environmental problems.
MC8		Contribute to the ability to apply this knowledge to address the issues of safety and reliability of operation of machinery and equipment and knowledge of the issues of social protection of workers.	- to know the main legislative acts on industrial safety, labor protection, environmental protection and civil protection; - apply the knowledge gained to address the safety and reliability of the operation of machinery and equipment; - ability to evaluate machinery and process equipment in terms of exposure to abnormal situations.
MC9	**Module. Socio-political knowledge and a healthy lifestyle**	form the skills of self-development and education throughout life;	-to assess situations in various spheres of interpersonal, social and professional communication, taking into account the basic knowledge of sociology, political science, cultural studies and psychology; - to synthesize knowledge of these sciences as a modern product of integrative processes; - to use scientific methods and approaches of research of a specific science, as well as the entire socio-political cluster; - develop their own moral and civic position; - operate with the social, business, cultural, legal and ethical norms of Kazakhstan society; - demonstrate personal and professional competitiveness; - to put into practice knowledge in the field of social sciences and humanities, having international recognition; - to make a choice of methodology and analysis; - summarize the results of the study; - to synthesize new knowledge and present it in the form of humanitarian socially significant products;
MC10		form a personality capable of mobility in the modern world, critical thinking and physical self-improvement.	- to build a personal educational trajectory throughout life for self-development and career growth, focus on a healthy lifestyle to ensure full social and professional activities through methods and means of physical culture.
		Basic competencies	**Learning outcomes**
		Formation of knowledge and ability to evaluate, develop and use new computer technologies	
MC 11	Module1.Natural-scientific training	The ability to understand the conduct of high-quality mathematical and physical research and on the basis of that develop practical recommendations, to use and	–to demonstrate knowledge of the basic concepts of Further Mathematic sandits application in various fields, to set mathematical tasks and select suitable mathematical methods and algorithms for solving the problem; to

		reasonably choose a mathematical apparatus in solving engineering problems; in assessing the degree of reliability of the results of experimental or theoretical research methods.	apply numerical methods for solving the problem using modern computing equipment; to be able to conduct high-quality mathematical research and on the basis of it to develop practical recommendations, – to master the skills of solving generalized typical tasks in various areas of physics as the basis for solving professional problems, independent cognitive activity, to simulate physical situations using a computer; to assess the degree of reliability of the results of experimental or theoretical research methods; analyze and evaluate the results, justify the results, draw conclusions and protect it
MC 12	**Module2. Basic programming**	To apply the fundamentals of algorithmization, methods for describing algorithms, basic information about high-level algorithmic languages, in mastering the work with standard procedures and functions, files when developing programs, designing program documentation, testing and debugging programs.	– to demonstrate knowledge and basic understanding of typical mathematical schemes for system modeling, diagrams of various algorithms, structures, syntax of programming languages and to justify their choice –to create algorithms for solving the tasks set, to optimize them, to code using C++, C# –to develop programs, to debug ,to test and to execute proper documentation, to code using Python and other high-level languages. –to choose a proper programming language, to develop programs in a good manner, to use computer hardware to solve automation problems
MC 13	**Module3. Basics of computer systems**	To master the principles, methods and ways of integrating hardware and software when creating computing systems, complexes and networks, principles of construction, operation and administration of modern operating systems.	–to demonstrate knowledge and understanding of typical circuit's solutions which are used in microcircuitry; to evaluate technical and operational capabilities of computers and computing systems. –to design and calculate chips using a computer; proper selectionas tructure of computing systems and the mode of its operation; –to demonstrate the knowledge and skills of the basic concepts, functions, composition and principles of operation of operating systems; principles of construction and computer architecture – to demonstrate the knowledge of building websites on the Internet; to

			master the main features, to be able to design and create simple websites; – to disassemble and to assemble a personal computer, install and configure operational and application software
MC 14	**Module4. Technological training**	Capable of using modern information processing technology, computing technology, computer systems technology and telecommunications in the design of automation systems, proper choice of technology for constructing multimedia and 3D objects on a PC, proper choice and developing interfaces for hardware and software, using Matlab software packages and its applications.	– to apply and to analyze modern methods of simulation modeling of physical control processes in the technical means of automation and technological processes in the MATLAB environment, to develop computer models of the studied processes and systems and to use them to determine the best options for project design, construction and technological solutions; –to demonstrate knowledge of the principles and algorithms for constructing interactive graphics systems; to create a program of target usage, to create an image based on the choice of tools; to work with graphic editors of various types, selection of objects for creating animation, to work in the environment of audio-video animation and graphics, in matters of choosing a technology for constructing multimedia objects. –to master the principles of organizing work with three-dimensional graphics; to be able to choose technologies for building 3D objects and build them on a PC; –to master the knowledge of structures and types of interfaces of the CS; to apply various types of interfaces in practice; to use technologies for designing hardware and software interfaces of the CS; – to demonstrate knowledge and understanding of the capabilities of modern information technologies in automation systems, basic methods of technical design and engineering; basic laws of the development of technical systems; typical mathematical schemes for system modeling.
MC 15	**Module5. Business management**	To master with the issues of organizing agribusiness and assessing its effectiveness, identifying causal relationships of economic phenomena and processes, making and substantiating any management	– to put into practice operational analysis mechanisms, to have skills in organizing agribusiness, in developing a financial profile of a business plan; – to form the ability to make and substantiate any managerial decision, in

		decision, in the field of methodological foundations of business planning; in conducting financial analysis of business processes of enterprises, innovative approaches to the study of the problem of financial sustainability of enterprises, in matters of competent communication, based on the goals and situation of communication;	the field of methodological foundations of business planning; –to apply the method of economic analysis in the practice of economic activity, to make management decisions based on the results of the analysis; to organize and conduct statistical observations; to build statistical tables and graphs; organize and conduct statistical observations; to build statistical tables and graphs – to apply acquired knowledge to build an effective business creation system and evaluate its effectiveness when collecting reliable economic information; in conducting financial analysis of business processes of enterprises, innovative approaches to the study of the problem of financial sustainability of enterprises and the ability give the rationale explanation for any management decisions; –to demonstrate the structure and pragmatics of scientific communication, features of the scientific style, to apply this knowledges for creating research works in written and oral form; to acquire the skills to search for authoritative articles in electronic resources and for self-create annotations.
MC 16	**Module 6. Professional programming**	Ability todevelop personal computer software, a modern mobile software, to develop application programs using modern tools.	- to know the basic ways of executing programs, the basic lexical constructs of the Java programming language, the CGI script language, built-in features of programming languages, principles of programming in high-level languages; to know how to execute programs, apply methods and means of solving practical problems of the subject area being mastered using programming languages; - to master the principles of programming for mobile technologies, to develop mobile programs in a good manner, debug and test them; to choose of programming style, debugging methods and testing programs for mobile technologies and the design and development of modern mobile software.
MC 17	**Module 7. Databases and DatabaseMan**	Ability to select a specific DBMS; to develop modern intelligent systems for UAV microcontrollers and other robotic systems, to analyze, to	- to generate the knowledge and understanding of the theoretical aspects of database development, to master the knowledge of the principles of organizing expert systems, design databases, and

	agement Systems	design, to program by using mathematical models and to optimize methods for solving managerial and engineering problems, to choose areas for information protection tools and methods; to know fundamentals of modern cryptography and architecture.	master the language of data manipulation and definition (SQL); - to master the knowledge of principles and programming of UAV microcontrollers, the basics of analyzing the results of solving managerial tasks; principles of construction and operation of technical and computer systems, design expert systems for UAVs and robots; - to set and solve specific tasks on the use of information security tools to optimize the functioning of computer systems and networks, the computational skills necessary for solving the simplest cryptographic tasks; – to apply methods and tools for the development of algorithms and programs, techniques for structured programming, methods for recording an algorithm in a high-level language, methods for debugging, testing and documenting programs.
		Professional competencies	**Learning outcomes**
		To form the ability to analyze, to design and to program applications and administration of computer systems, to compile high-quality software documentation.	
MC 18		**Module 8. Software Basics** To develop the ability to solve issues in the field of operating systems and system programming; application of modern engineering principles (methods) to create reliable, high-quality software and compile high-quality software documentation	– to build knowledge and understanding of the principles of developing system software and the main directions in the design, development of software products and a set of tools to ensure their life cycle; – to systematize and to use the theoretical foundations of the construction of tool software; to use international and domestic standards for software products development; – the ability to apply object-oriented and generalized programming technologies when creating system programs, using proper software tools for software development; – to master the skills of writing high-quality software documentation.
MC 19		**Module 9. Computer Systems Research** The ability to choose and master effective ways to manage and analyze databases, computer systems and	– to master the knowledge and understanding of database design and modeling principles; to master the principles of management and design of information systems and client-server applications;

		networks; computer processing of analog and digital information, methods of analysis, to research and model of computational and information processes related to the functioning of objects of professional activity and the way of development of modern programs.	– to master the knowledge of the basic methods of mathematical processing of information, the stages of production of a software product for the Internet. – to choose and to master effective ways of managing and analyzing databases, computer systems and networks; – to possess methods of analysis, research and modeling of computational and informational processes related to the functioning of objects of professional activity and methods of developing modern programs.
MC 20		**Module 10. Telecommunication networks and application programming** The formation of the ability to design and manage computer systems and networks, the analysis, design and programming of applied problems.	– to build and to select equipment for networking; the management in the operating environment; to build and to select equipment for networking; the management in the operating environment; – to apply knowledge of the basic capabilities and rules of management of various DBMS; principles of operation and the logical relationship of PHP with other elements of web-technologies, the development of relational databases; skills of working with a web server; –to anticipate and promptly prevent possible hazards in the production of cloud applications; – to apply the technologies of object programming, choice of programming style, methods of debugging and testing programs; to evaluate and work with modern means of designing information systems; to analyze, to design and to program applied tasks.

5. Summary table reflecting the amount of credits mastered in the context of the educational program:

Course of study	Semester	Number of studied disciplines			Number of academic credits						Total in academic hours	Military training	Amount	
		RC	UC	CC	Theoretical training	Educational practice	Internship	Undergraduate practice	Final examination	Total			Exam	Diff. check
I	**1**	4	2	1	32					32	960		7	
	2	5	1		30	2				32	960		6	1
II	**3**	2	2	2	28					28	840		6	
	4	1	1	4	27		5			32	960		6	1
III	**5**		1	5	31					31	930		6	
	6		1	3	24		5			29	870		4	1
IV	**7**		1	4	29					29	870		5	
	8			3	12		5		8	31	930		3	1
Total		**12**	**7**	**23**	**219**	**2**	**15**		**8**	**244**	**7320**	**588**	**43**	**4**

*Appendix1 **

Information about the disciplines

№	Name of discipline	**Short description of discipline (30-50 words)**	**Quantity of the credits**	**The formed competences (codes)**
Cycle of general education disciplines High school component / Component for choice				
1	History of Kazakhstan (SE)	The study of the course is aimed at the formation of students the concept of modern history of the Fatherland, based on a holistic and objective coverage of the problems of ethnogenesis of the Kazakh people, the evolution of forms of statehood and civilization in the great steppe and the totality of the most significant historical facts and events. Systematization of historical knowledge about the main events of modern history, forming a scientific worldview and citizenship. Creation of ideological and spiritual basis for consolidation of multi-ethnic and multi-confessional Kazakhstan society	**5**	**MC 1** LO 2
2	Philosophy	The course aims to form students` concepts of philosophy as a special form of knowledge of the world, its main sections, problems and methods, as well as skills of self-analysis and moral self-regulation, the development of research abilities and the formation of intellectual and creative potential.Special attention is paid to the problems of preserving national identity, the assimilation of such key ideological concepts as justice, dignity and freedom, and the role of philosophy in modernizing public consciousness and solving global problems of modernity.	**5**	**MC 2** LO 1 LO2

3	Foreign language	Learning a foreign language sets tasks for the development of foreign language communicative competence in the totality of its components: • Speech competence - the development of communication skills in four main types of speech activity; • language competence - mastering new language means (phonetic, spelling, lexical, grammar); • Socio-cultural competence - the formation of the ability to represent your country, its culture; • educational and cognitive competence - familiarity with the methods available to learners and methods of independent study of languages and cultures	**10**	**MC** 3 LO2
4	Kazakh (Russian) language	The discipline is intended to develop a languageidentity of the learner who is able to perform cognitive andcommunicative activities in Russian in the fieldsinterpersonal, social, professional, interculturalcommunication in the context of the implementation of state programs of trilingualism and spiritual modernization of the national consciousness. The discipline implies the successful mastery of the types of speech activity inaccording to the level preparation	**10**	**MC** 3 LO2
5	Information and communication technology (in English)	Formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, ways of collecting and transmitting information through digital technologies. Mastering the conceptual fundamentals of computer systems, operating systems and networks. Formation of knowledge about the concepts of development of network and web applications, information security tools.	**5**	**MC** 4 LO5 LO 6 LO11
6	The module of socio-political knowledge		8	
	Sociology	studies society, revealing the internal mechanisms of its structure and the development of its structures (structural elements: social communities, institutions, organizations and groups); patterns of social actions and mass behavior of people, as well as relations between the individual and society, sociology explains social phenomena, collects and summarizes information about them.	**2**	**MC 9** LO2

	Political science	the science of politics, the laws of the emergence of political phenomena (institutions, relationships, processes), the methods and forms of their functioning and development, the methods of managing political processes, political consciousness, culture, etc.	**2**	**MC 9** LO1
	Culturology	studies on culture, its history, essence, patterns of functioning and development, which can be found in the works of scientists representing various options for understanding the phenomenon of culture. In addition, cultural studies are engaged in studying the system of cultural institutions, through which the upbringing and education of a person are carried out and which produce, store and transmit cultural information.	**2**	**MC 9** LO1
	Psychology	Psychology is a science which goal is to study the mechanisms of the functioning of the human psyche. It examines the patterns of people's behavior in various situations, the resulting thoughts, feelings and experiences. Psychology is something that helps us to get to know ourselves more deeply, to understand our problems and their causes, to recognize our weaknesses and strengths. Studying Psychology contributes to the development of moral character and morality in man.	**2**	**MC 9** LO1 LO2
7	Physical education	Discipline covers a range of issues related to physical culture, as part of human culture, healthy lifestyle, its main components, socio-biological basis of human adaptation to physical and mental activity, preparation for independent physical culture and sports, age physiology, self-control physical condition, psychophysical basis of physical culture and sports, hygiene.	**8**	**MC** 10 LO1
8	Law and anti-corruption culture	The course provides for the disclosure of the main issues of the theory of the origin of the state and law, identifying the peculiarities of the branches of Kazakhstan's law, increasing the legal literacy of students in the field of anti-corruption legislation, the formation of an anti-corruption of behavior	**5**	**MC** 5 LO2
	Economy	The objectives of the discipline are: - the disclosure of the general foundations of economics theory; - the study of the laws of business management and rational behavior		**MC** 6 LO1 LO2

		of business entities at various levels, the elucidation of the principles and laws of economics development, the disclosure of the basic economic concepts and categories.		
	Ecology	The acquisition of theoretical knowledge in the field of ecology, improving environmental literacy, the ability to apply knowledge in professional and other activities		**MC** 7 LO2
	Life safety	The discipline is about human behavior in an emergency; features group psychology; special mental states; implementation of measures to protect facility personnel in the event of a threat and the occurrence of an emergency, sustainability of the organization.		**MC** 8 LO1, LO2
	Fundamentals of Scientific research	Training of bachelors in the theoretical foundations of organizing and planning scientific, technical and innovative activities, who are able to use this knowledge in solving specific problems with the widespread use of economic and mathematical methods, computer technology and telecommunications.	**5**	MC7 LO 1, LO 2, LO 7, LO 11
	Financial Literacy	The course "Financial Literacy" develops knowledge and skills in the field of finance, which allow students to correctly assess the market situation and make specific decisions. Knowledge of basic financial concepts and the ability to apply them in practice allows a person to competently manage their funds. That is, it teaches how to keep track of income and expenses, avoid excess debt, plan a personal budget, save, use based on the choice of products offered by financial institutions, use savings and insurance instruments	**5**	**MC** 7 LO2
	Entrepreneurship	The subject “Entrepreneurship” will teach you to develop the right competencies that will be useful in life for any entrepreneur, understand how to properly create a team for your project, learn how to choose the right business idea based on market needs, develop a business model and draw up a business plan to start your business	**5**	
9	Mathematics 1	The discipline studies sections of linear and vector algebra, mathematical analysis (introduction to analysis, indefinite integral, definite integral), analytical geometry for	**5**	CC11 LO1 LO4

		analysis, theoretical and experimental research and solving applied problems.		
10	Mathematics 2	The discipline studies sections of mathematical analysis (functions of several variables, series), differential equations, probability theory, mathematical statistics for analysis, mathematical modeling, theoretical and experimental research and solving applied problems.	**5**	CC11 LO1 LO4
11	Physics	Formation of an in-depth understanding of the structure of matter, the nature of the phenomena occurring in it, which determines the development of natural science and scientific and technological progress. The connection of physics with other natural sciences and related disciplines. The role of physics in the creation and development of new branches of engineering and new technologies. The influence of technology on the development of physics. Methods of physical research: experience.	**5**	CC11 LO1 LO3
12	Data structure and programming	Formation of basic knowledge about the basic algorithms and data structures used to store and retrieve information, analyze and implement basic programming algorithms and data structures, as well as design and development of means for implementing applied information technologies. Formation of knowledge of methods of structured and object-oriented programming, the ability to develop and debug programs using the Python language	**5**	CC12 LO4 LO6 LO8 LO9
13	Object oriented programming	Formation of basic knowledge about the basic elements, methods and principles of Object-Oriented Programming using the C++ language as an example. The use of OOP in the development of application programs.	6	CC12 LO4 LO6 LO8 LO9
14	C# programming	The main objectives of the course based on a systematic approach: introduction to the basic ideas of reusing code and application components, problems of collective application development; studying the basic	6	CC12 LO4 LO6 LO8 LO9

		concepts of the NET Framework platform and its components, studying C # as a language tool that most fully reflects the capabilities of the NET Framework; formation of skills for creating applications in C#.		
15	Designing applications in the Python programming language	At the moment, the Python language is recognized as the most common programming language in data processing tasks. We continue to study the problems of object-oriented and functional programming in creating event-driven programs.	5	CC12 LO4 LO6 LO8 LO9 LO11
16	Digital circuit design	Formation of the ability to systematize information about the structure and principles of operation of computing systems for various purposes. Mastering the basic methods of constructing and designing circuits of discrete and integrated elements, integrated circuits, blocks and devices. Mastering practical skills in the development and use of circuits of various levels and integrated circuits in the design of digital devices.	5	CC13 LO3 LO7
17	Computer organization and assembler	The discipline studies the fundamentals of computer systems architecture. The algorithms for executing instructions, control blocks and performance problems of computer systems are also considered. Students are introduced to the low-level assembly language, which is close to the machine code of a computer. The basics of syntax, processor commands, working with memory and registers, as well as developing and debugging programs are studied.	**6**	CC13 LO3 LO5 LO7 LO8
18	Operating system design	Acquaintance with the evolutionary development of the OS, its purpose and functions. The study of the classical foundations of modern operating systems and their architecture, algorithms and methods used in their development and design of the Microsoft OS..	**5**	CC13 LO3 LO5 LO7 LO8
19	Modern Neural networks	A neural network is considered as a mathematical model, its software or hardware implementation, built on the principle of organization and functioning of	**5**	CC13 LO3 LO5 LO7

		biological neural networks - networks of nerve cells of a living organism. A system of simple processors connected and interacting with each other (artificial neurons) deals with the signals that it receives or sends to other processors performing complex tasks.		LO8
20	HTML website development	Familiarization with the principles of the Internet, types of sites. Learn the HTML markup language and apply it in website building and web page design. Use graphics on web pages in various formats..	4	CC13 LO4 LO5 LO8 LO9
21	Web programming	It is an introductory cycle of works on web programming, which describes the basic terms and concepts that characterize the modern web, as well as technologies for web development, such as HTML, PHP.	4	C13 LO4 LO5 LO8 LO9
22	System modeling software	To develop theoretical knowledge about the principles of constructing simulation modeling systems, the ability to independently analyze the flow of physical processes of dynamic objects and their individual components using simulation methods, to conduct experimental studies using system modeling software (Matlab).	5	CC14 LO4 LO8 LO9
23	Systems analysis and decision making theory	The study of the course is aimed at the formation of students' theoretical foundations and patterns of building and functioning of systems, including economic, methodological principles, their analysis and synthesis, the application of the studied patterns to develop systemic approaches in decision-making, the methodology of system analysis.	5	CC14 LO4 LO8 LO9
24	Interactive graphics systems	Acquaintance with graphic systems: CorelDraw, PhotoShop, Adobe Flash Professional. Acquire skills in working with graphic systems and apply skills in the development of websites, advertisements, electronic textbooks, the development of animated films, etc.	6	CC14 LO4 LO5 LO6

25	Encoding and compression methods	Formation of students' theoretical foundations, practical skills and abilities to use modern graphic editors in the field of 3D modeling and teaching the basic principles of work. Learning to design three-dimensional values; obtaining knowledge on modeling and animation from a three-dimensional step; training in the compilation, modeling and use of three-dimensional values.	6	CC14 LO3 LO4 LO5 LO8
26	3D modeling	General information, technical information, 3D MAX interface and practical purpose. Simple modeling. Basics of creating splines. Simulation using boolean operations. Work with materials. Work with scene objects. Creating lighting in the scene. Visualization. Principles of animation. Hierarchical relationships.	5	CC14 LO3 LO4 LO6 LO8
27	Computer Systems Interface Design	The purpose of the discipline is to master the principles of organization and functioning of software and hardware interfaces in modern computer systems and to teach methods of designing user interfaces in their relationship with software and hardware interfaces at the application level	5	CC14 LO3 LO4 LO8 LO9
28	Agrarian Economics	Agrarian Economics" studies the actions of objective economic laws and the forms of their manifestation in agriculture, production relations in connection with other areas of material production, and is based on the results of research in natural, technical and other related sciences	5	CC15 LO2
29	Programming in Java	The discipline is designed to familiarize students with the basics of the Java programming language and develop application development skills on this platform. The purpose of this discipline is to teach students the basic concepts and techniques of Java programming, as well as to develop practical skills in creating Java applications.	5	CC16 LO4 LO6 LO8 LO9 LO11
	Script Technology	The discipline is aimed at studying the basic principles and methods for developing	5	CC16 LO4

30		script programs. A script is a small program or set of commands that is executed by an interpreter or virtual machine. The purpose of this discipline is to familiarize students with various scripting languages, their capabilities and applications in various fields.		LO6 LO8 LO9 LO11
31	Mobile programming	Acquire stable knowledge of programming mobile gadgets, services, services. It is planned to study the basic device of the Android platform and the opportunities that this platform provides for the development of mobile systems, gaining practical skills in creating user interfaces, services, as well as using alarms, hardware sensors and standard information stores within the specified platform.	6	CC16 LO4 LO5 LO6 LO9 LO11
32	Developing Mobile Applications on iOS	The purpose of this discipline is to study the basic device of popular mobile platforms and the opportunities offered by this platform for developing mobile systems based on emulators, gaining practical skills of creating user interfaces, services, as well as using signaling, hardware sensors and standard information stores of popular mobile platforms.	6	CC16 LO4 LO5 LO6 LO9 LO11
33	Database systems and knowledge	The acquisition by students of the theoretical foundations and practical skills in designing and maintaining databases using specific DBMS. Studying the methods of database development, designing hierarchical, network and relational databases and knowledge and building infological, conceptual models., SQL and QBE query languages	5	CC17 LO5 LO8 LO11
34	Models and methods of control	Possession of the basics of knowledge in the field of methods and models of management, the theoretical foundations of management, the current state and main directions of development of management. Formation of theoretical knowledge about statistical and quantitative methods for the development, adoption and implementation of managerial decisions and practical skills to find organizational and managerial decisions.	5	CC17 LO4 LO5 LO9 LO11
35	IT-infrastructure	To form students' solid knowledge of IS design by types of support, organization of	5	CC17 LO8

		IT infrastructure and information security management, and participation in the implementation of professional communications within project groups according to the ITIL / ITSM methodology		LO9 LO11 LO12
36	Programming microcomputers unmanned aerial vehicles	To develop in students a solid knowledge of the theory and technology of creating unmanned aerial vehicles and the ability to program UAV microcomputers and develop applications for UAVs	6	CC17 LO4 LO6 LO8 LO11
37	Development of a robotic system	The purpose of the discipline is to provide students with the necessary knowledge and skills in the field of organization and application of robotic systems, the acquisition of practical skills in designing robotic systems.	6	CC17 LO4 LO6 LO9 LO11
38	Computer security system	Forming the ability to ensure safety precautions during organizational and technical activities, the use of software, hardware and technical means of information protection at professional sites, to participate in the operation of systems and means of protecting information of protected objects, to record failures in the operation of means of protection, to identify and analyze possible threats to information security of objects.	5	CC17 LO8 LO9 LO10
39	Cryptography and network security	Familiarization of students with organizational, technical, algorithmic and other methods and means of protecting computer information, with modern cryptosystems, studying methods for protecting information.	5	CC17 LO8 LO9 LO10
40	Software Architecture	It studies system software, as a complex of programs that provide control of computer system components, such as a processor, RAM, input-output devices, network equipment.	6	CC18 LO6 LO8 LO9 LO11
41	Software engineering	To form knowledge in creating software, in choosing models and profiles of the life cycle, mastering the tools and methods of software engineering, skills in maintaining,	5	CC18 LO8 LO9 LO11 LO12

		testing software and managing software engineering workflows.		
42	Technologies for developing client-server applications	The discipline is designed to familiarize students with the principles and methods of developing applications in which the interaction between the client and server parts plays an important role. The goal of this discipline is to teach students the basic concepts and technologies used in creating client-server applications, as well as to develop practical skills in developing such applications.	6	CC19 LO5 LO9 LO11 LO12
43	Big Data Analytics	Familiarization with technologies for storing and processing Big Data, programming the processing and loading of Big Data in SAS, analytics in Big Data. Mastery of the principles of constructing and using database servers in various networks, tools for developing database applications in client-server technologies..	6	CC19 LO5 LO9 LO11
44	Digital information processing	The objectives of studying the discipline are: students' mastery of modern technologies for processing and analyzing information; mastering effective methods of information processing using modern computers; formation of an integral system of knowledge in the field of creation, accumulation, processing and use of information resources; acquisition of methodological foundations and practical skills in information processing.	5	CC19 LO5 LO8 LO11
45	Oracle Database Administration	This course provides basic knowledge and skills in database administration. Learn how the Oracle database is installed and managed, gain a conceptual understanding of the Oracle database architecture and how its components work and interact with each other.	5	CC19 LO5 LO8 LO9 LO11
46	Modeling information processes and systems	The subject of the course is familiarization with the basic models of information processes, the organization of information processes at the physical and channel levels. Study of modern methods and models for constructing information systems of various types of purpose and content.	6	CC19 LO4 LO8 LO10 LO11

47	Modeling in agricultural production planning	Studies objective cyclical genetic patterns of agricultural development based on the use of mathematical modeling methods. This approach is necessary to solve the problem of ensuring food security based on the innovative development of the agro-industrial complex.	6	CC19 LO4 LO8 LO10 LO11
48	Computer networks	The purpose of the course is to familiarize students with the principles of design and operation of computer networks, deepening knowledge, skills and abilities in the field of professional activity. The student must acquire practical experience in installing and configuring network protocols and network equipment in accordance with a specific task; ensuring safe storage and transmission of information in the local network.	6	CC20 LO5 LO7 LO10
49	System and network administration	The content of the discipline covers a range of issues related to the basics of computer network administration, installation and configuration of operating systems, the basics of building computer networks, server administration, and working with the basics of information security.	6	CC20 LO5 LO7 LO9 LO10
50	PHP in programming	The goal of the course is to acquire confident practical skills in web programming using the PHP language and skills in developing website-level applications. PHP programming course - purpose, language syntax, basic library functions, basic usage techniques, building web applications based on PHP scripts, using databases in interaction with applications in this language.	5	CC20 LO6 LO9 LO11
51	Block programming	Aimed at learning the basics of programming, solving problems using Scratch and Blockly, consolidating material and developing technical specifications, creating an individual project. Development of creative abilities and implementation of programming skills when creating cartoons, interactives and games in Scratch and Blockly.	5	CC19 LO4 LO6 LO8 LO9 LO11
52	Framework based web application development	The goal of mastering the discipline is to study modern trends in web programming: frameworks for creating applications, the latest technologies and tools for website	5	CC19 LO5 LO6 LO7 LO9

		development, as well as modern DBMS for working with website data		
53	Web services administration	Concepts related to Web services are considered, i.e. identified with a unique web address, a software system with standardized interfaces, displayed by the user's browser. The operating principle of Web services of various protocols.	5	CC20 LO5 LO9 LO10 LO11
54	Cloud computing technology	Familiarization with the main directions of development of infrastructure solutions, the concept of cloud computing. Solution providers - Microsoft, Amazon, Google. Development of these applications on these platforms, skills, as well as experience in ready-made cloud services Windows Live and Office 365.	5	CC20 LO5 LO9 LO10 LO11
55	Distributed computing technology	The discipline aims to provide an overview of the main trends in the development of infrastructure solutions that led to the emergence of the concept of cloud computing. Attention is paid to virtualization technologies. A review of solutions from leading vendors - Microsoft, Amazon, Google - is carried out..	5	CC20 LO5 LO9 LO10 LO11
56	Design patterns	Design pattern or pattern in software development - repeatable an architectural design that represents a solution to a design problem within some frequently encountered context. The template is not a complete example, so we consider converting it into code that can be used in various situations. A description is given of "Low-level" patterns covering the architecture of the entire software system	5	CC20 LO8 LO9 LO10 LO11
57	Software Project Management	Familiarization with existing software and its classification, non-application programs and software packages, internal and external software products; be able to formulate requirements for software products and compile them. Understand the structure of programs, develop application software packages to implement standard procedures for processing economic information and build new automated jobs	5	CC20 LO9 LO10 LO11

Appendix 2.

Base practice

№	Name of companies, enterprises, organizations	Contacts tel, e-mail
1	2	3
1	Institute of Information and Computing Technologies	Tel.: +7 (727)272-37-11 E-mail:info@ipic.kz
2	LLP «Scientific and Production Center of Agroengineering»	Tel.: +7 (727)247-96-04 +7(777)271-57-28 E-ail:**kazniimech@yandex.kz**
3	«Information and Computing Center of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan» in Almaty	tel.: +7 (727)331-27-15, +7(727)331-27-11, E-mail:s.saduov@statdata.kz
4	Department of Statistics of the Almaty region of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan	**tel: +7(727)271-54-98** E-mail:oblstat.almaty@mail.ru
5	Branch of National Company “Kazakhstan Temir Zholy” JSC - “Directorate of Automation and Digitalization”	Tel: 8(7172) 60-61-00 E-mail: makhuov@mail.ru
6	Branch of JSC "Eurasian Bank" Maktaral region of Turkestan region	Tel.:8(725)346-32-88 E-mail: eurasianbank@mail.ru
7	Kazpost JSC, Merkensky regional post office	Tel. +7(263)22-14-31 E-mail: E-mail:merkerp@kazpost.kz
8	LLP MFO Bolashak »	Tel: 8(7132)24-44-18 E-mail: mtobolashak@mail.ru
9	Kazpost JSC, “Sarkansky District Postal Communication Center”	Tel. +7(7263)22-14-31 E-mail:merkerp@kazpost.kz
10	Kazpost JSC, “Almaty city post office number 73”	Tel: 8 (707) 308-08-18 E-mail.: kazpost.kz@mail.ru
11	«NDK-Engineering» LLP	tel: **+7(727)356-08-68** E-mail:
12	«Nurmedinvest»LLP	Tel: +7(701)098-58-97 E-mail:office@mni.kz
13	«TransCom» LLP	Tel.:+7(727)244-29-90 E-mail:info-tc@erg.kz
14	«Nur-Asyl TransGroup» LLP	Tel.: +7(727)267-25-72 E-mail: info@jenty-spedition.com
15	«Технобел»LLP	Tel.: +7(727)267-25-72 E-mail: info@jenty-spedition.com
16	LLP "Ramstore Kazakhstan" in the city of Almaty	Tel.: +7(727)330 55 77 E-mail: infoonline@ramstore.kz
17	State Institution "Department of Entrepreneurship of Balkhash District"	Tel.: **+7**(727) 739 53 85 E-mail:balhash.otdel@mail.ru

18	"Department of Public Service Center of Sarkand District for Public Service" of the branch of the non-profit joint-stock company "State Corporation" "Government for Citizens" in Almaty region	Tel.: +7(728)3922627 E-mail: sarkan_con@mail.ru
19	KSU "Aktobe Regional Universal Scientific Library named after S. Baishev"	Tel.: +7(7132)237400 E-mail.: aktobe_kitap@mail.ru
20	State Institution "Akim's Office of the Orangai Rural District" of the Akimat of the city of Kentau of the Turkestan region	Tel.: +7(707)2314974 E-mail: orangay.akimat@mail.ru
21	JSC "Kazpost" Kyzylorda regional branch	Tel.: +7(7242) 23-54-32, (7242) 23-33-11, (7242) 23-54-91 E-mail: post-kzyl@kzylorda.kazpost.kz
22	SI "Department of Education" of the city of Arys	Тел.: +7(705)-225-86-89 E-mail gor.458565@mail.ru
23	Public utility company on the right of economic management "Shielinskaya interdistrict hospital" of the health department of the Kyzylorda region	Тел: +7(72432) 4-64-05 E-mail: kdp_shieli@mail.ru
24	LLP "Bayserke agro"	Тел.: +7 (701) 991-61-20, +7 (8701) 555-60-58 bajserke-agro.all.biz
25	"Aktobe signaling and communication distance" of the branch of the joint-stock company "National company" Kazakhstan Temir Zholy "-" Aktobe branch of the backbone network "	Тел: +7(7132)21-22-07, +7(7132) 97-52-49 E-mail: Ekibaev_S@Aktobe.Railways.kz
26	Branch of JSC Kazakhtelecom East Kazakhstan region, Urdzhar region	Тел: +7(722 39) 40000-42447
27	«Altair technology» LLP	Тел. +7(726)3221431 E-mail info.altech@mail.ru
28	LLP "EL-KUT"	Тел: +7(702)3117853, 87767324997 E-mail: i-ziahanova@mail.ru
29	LLP "Oil Gas Production Services" Aktau	тел: +7(707)6305843 E-mail.: zhomart1968@mail.ru
30	"Department of Agriculture of the Akimat of the Merken region"	Тел: +7(707)4874891 E-mail: merke_sh@mail.ru

Қазақ ұлттық аграрлық зерттеу университеті
Коммерциялық емес акционерлік қоғамы
«Инженерлік-техникалық» факультеті
«IT -технологиялар және автоматтандыру» кафедрасы

№6 ХАТТАМА КӨШІРМЕСІ

25 қаңтар 2024 жыл **Алматы қаласы**

«IT- технологиялар және автоматтандыру» кафедра мәжілісінің отырысы

Төрайым - Аманбаева Эльмира Амангельдиевна
Хатшы - Самбеткулова Назира Нургалиевна

Қатысқандар: 31 адам (тізімі қоса тіркелді)

КҮН ТӘРТІБІ

4. Әртүрлі мәселелер. 2024-2028 жылдарына арналған 6В06103 – «Есептеу техникасы және бағдарламалық қамтамасыз ету» білім беру бағдарламаларын талқылау.

ТЫҢДАЛДЫ: «IT- технологиялар және автоматтандыру» кафедрасының меңгерушісі Аманбаева Эльмира Амангельдиевна 2024-2028 жылдарға арналған 6В06103 – «Есептеу техникасы және бағдарламалық қамтамасыз ету» білім беру бағдарламаларын талқылау үшін сөз кезегін кафедраның профессор-оқытушыларына береміз.

СӨЗ СӨЙЛЕГЕНДЕР:кафедра профессоры Киргизбаева Б.Ж. қарастырылып отырған 2024-2028 оқу жылдарына арналған 6В06103-«Есептеу техникасы және бағдарламалық қамтамасыз ету» білім беру бағдарламасының мақсаттары оқыту және тәрбиелеу барысында түлектің дербес өмірге дайындығының жоғары деңгейіне қол жеткізуге бағытталған. ББББ интеллектуалды, жеке және мінез-құлық қасиеттерін, оның қазіргі қоғамдағы өнімді кәсіби қызмет қабілеттерін қалыптастыруға қатысты қоғамның әлеуметтік үміттеріне толық жауап береді.

Білім беру бағдарламасында қарастырылған пәндер ақпараттық ресурстар мен компьютерлік жүйелерді құру және басқару бойынша бакалаврдың кәсіби құзыреттілігін қалыптастыруға толық ықпал етеді. Модульдердің жекелеген жаңа пәндері бағдарламаға ЕСУВО сарапшыларының ескертулерін іске асыру мақсатында енгізілген, олар - Мәліметтер құрылымы және бағдарламалау, Web -бағдарламалау, Framework негізіндегі web -қосымшаларды әзірлеу, Клиент-сервер қосымшаларын әзірлеу технологиялары, Заманауи көріністегі нейрондық желілер. Жұмыс

берушілердің ұсынымдарын орындау мақсатында бағдарламаға Python -да қосымшаларды құрастыру, Ауыл шаруашылығы өндірісін жоспарлаудағы модельдеу сияқты пәндер енгізілген

Жұмыс беруші: Қазақстан Республикасының Білім және ғылым министрлігің Ғылым комитеті Ақпараттық және есептеуіш технологиялар институтының бас директорының орынбасары; PhD., қауым.профессоры Мамырбаев Ө. Бағдарламаның құрылымы тұтастай алғанда дәйекті және қисынды. Бағдарламаға енгізілген пәндер бүгінгі таңда Ақпараттық технологиялар саласындағы өзекті мәселелердің мәнін ашады. Ұсынымдар ретінде әзірлеушілерге кәсіби стандарттардың барлық қырларын тек жаңа пәндермен ғана емес, сонымен қатар Агроөнеркәсіптік өндірісті дамыту үшін АКТ саласындағы жаңа технологиялармен бірге қарастырылып отырған пәндерге жаңа тақырыптар түрінде ашылған.

Жұмыс беруші: «Агроинженерия ғылыми-өндірістік орталығы» ЖШС зертхана меңгерушісі, т.ғ.д., профессоры Алтыбаев А. Әзірленген Білім беру бағдарламалары бакалаврді дайындауға арналған. Ғылыми және кәсіби дайындықтан өтіп, заманауи ақпараттық технологияларды игеріп, ғылыми зерттеулер әдіснамасы саласында құзыретті болуы керек, заманауи ғылыми және практикалық мәселелерді тұжырымдай және шеше білуі керек. Зерттеу және басқару қызметін сәтті жүзеге асырады, осы білім беру бағдарламасы бойынша оқыту нәтижесінде қалыптасады. Басты талаптарға сай екенін айтып өтті.

ВТ-22-12к тобының студенті Оңалбай Е. Бұл енгізілген пәндер қазіргі жаңа IT бағытта шығып жатқан техникаларды игеруге мүмкіндік береді. Жаңадан енгізілген пәндер кредиттік технологиясының оқыту ережесінің талаптарына сай дайындалғанын айтты.

2023 жылғы түлек Әміт М. Бағдарламаның құрылымы тұтастай алғанда дәйекті және қисынды. Бағдарламаға енгізілген пәндер бүгінгі таңда Ақпараттық технологиялар саласындағы өзекті мәселелердің мәнін ашады, талаптарға сай екенін айтып өтті.

ҚАУЛЫ ЕТТІ: 2024-2028 оқу жылдарына арналған 6В06103-«Есептеу техникасы және бағдарламалық қамтамасыз ету» білім беру бағдарламаларының өзгертулерін қарастырып, талқылау үшін факультеттің академиялық комитетіне ұсынылсын.

Төрайым **Э. Аманбаева**
Хатшы **Н. Самбеткулова**

Хаттама көшірмесін растаймын: Н. Самбеткулова

«Қазақ ұлттық аграрлық зерттеу университеті»
коммерциялық емес акционерлік қоғамы
«Инженерлік-техникалық» факультеті

№6 ХАТТАМАСЫНАН КӨШІРМЕ

« 26 » қаңтар 2024 ж **Алматы қаласы**

«Инженерлік-техникалық» факультетінің Академиялық комитетінің кеңейтілген отырысы.

Факультет бойынша білім беру бағдарламаларының мазмұнын талқылау.

Төраға: Ибишев У.Ш.
Хатшы: Дюсенбиева А.Х.
Қатысқандар: Академиялық комитет мүшелері (кафедра меңгерушілері, жұмыс берушілер өкілдері, білім беру бағдарламаларын құрастыруға жауаптылар, түлектер, студенттер) барлығы 25 адам (тізімі қоса тіркелді).

КҮН ТӘРТІБІ:

1. 2024-2028 жылдарына арналған білім беру бағдарламаларын талқылау және оларды қарастыру үшін университеттің оқу-әдістемелік Кеңесіне ұсыну туралы.

ТЫҢДАЛДЫ:

Факультетің академиялық комитет төрағасы Ибишев Өмірбай Шәрібекұлы күн тәртібіндегі үш деңгейдегі барлық білім беру бағдарламаларын мазмұнын талқылау бойынша «Бакалавриат», «Магистратура», «Докторантура» деңгейлерінің білім беру бағдарламаларындағы өзгерістер мен оларға қойылатын талаптарды айтып жеткізді. Бакалавриат деңгейіндегі барлық білім беру бағдарламалары бойынша 2024-2028 оқу жылдарына жалпы білім беру пәндерінің кредит саны 56 кредит болып қалатындығын, ал базалық және бейіндік пәндердің кредит саны артатынын, себебі кәсіптік практикалар бойынша оқу практикасы 2 кредит, өндірістік практика 10 кредит, кәсіби практика 5 кредитке өзгертілгендігін айтып өтті. Осыған байланысты кафедралар өздеріне бекітілген білім беру бағдарламаларының мазмұнымен таныстыруын және қатысушылар оны талқылауға белсенді атсалысып, өз ұсыныстарын ашық білдіруді сұрады. «IT-технологиялар және автоматтандыру» кафедрасының ұжымымен дайындалған 2024-2028 оқу жылдарына арналған 6В06103 – «Есептеу техникасы және бағдарламалық қамтамасыз ету» білім беру бағдарламасын арнайы талқылауды ұсынды. Сөз кезегі Академиялық комитет мүшесі «IT-технологиялар және автоматтандыру» кафедрасының меңгерушісі Э.А. Аманбаеваға берілді.

СӨЗ СӨЙЛЕГЕНДЕР:

1. «IT-технологиялар және автоматтандыру» кафедрасының меңгерушісі, Академиялық комитет мүшесі Эльмира Амангельдиевна Аманбаева қарастырылып отырған 2024-2028 оқу жылдарына арналған 6В06103 – «Есептеу техникасы және

бағдарламалық қамтамасыз ету» білім беру бағдарламасына Қазақстан Республикасы Ғылым және жоғары білім министрінің 2022 жылғы 20 шілдедегі №2 бұйрығы негізінде Жоғары және жоғары оқу орнынан кейінгі білім берудің мемлекеттік жалпыға міндетті стандартының жаңартылуына байланысты Қазақстан Республикасы экономикасының көлік секторы еңбек нарығының сұраныстарының талаптарына сай өзгерістер енгізілгенін атап өтті. Білім беру бағдарламасын құрастыру барысында жұмыс берушілер: ҚР Ғылым және жоғары білім министрлігі ҒК Ақпараттық және есептеуіш технологиялар институтының бас директорының орынбасары, PhD, қауымдастырылған профессор Ө. Мамырбаев; ҚР стратегиялық жоспарлау және реформалар агенттігінің Ұлттық статистика бюросының «Ақпараттық-Есептеу Орталығы» РМК филиалының директоры Е. Иембердиев сонымен қатар осы білім беру бағдарламасы бойынша 2022 жылғы түлек М. Әміт, ВТ 22-12к топ студенті Е. Оңалбай атсалысқанын, сондай-ақ олардың талаптары мен тілектерінің ескерілгенін айтты. 6В06103 – «Есептеу техникасы және бағдарламалық қамтамасыз ету» білім беру бағдарламасына ҚР Ғылым және жоғары білім министрлігі ҒК Ақпараттық және есептеуіш технологиялар институтының бас директорының орынбасары, PhD, қауымдастырылған профессор Ө. Мамырбаев пен ҚР стратегиялық жоспарлау және реформалар агенттігінің Ұлттық статистика бюросының «Ақпараттық-Есептеу Орталығы» РМК филиалының директоры Е. Иембердиев оң пікір берген.

Аманбаева Э.А. ұсынылып отырған білім беру бағдарламасының талаптарға сай дайындалғанын айта келіп, университеттің оқу-әдістемелік Кеңесінде қарастыруға ұсыныс жасады.

2. 6В06103 – «Есептеу техникасы және бағдарламалық қамтамасыз ету» білім беру бағдарламасын құрастыруға жауапты, Академиялық комитет мүшесі, ф.-м. ғ. к., профессор Б.Киргизбаева қарастырылып отырған 2024-2028 оқу жылдарына арналған . 6В06103 – «Есептеу техникасы және бағдарламалық қамтамасыз ету» білім беру бағдарламасы көлік техникасын пайдалану бойынша білімі мен дағдыларды, технологиялық процестерді енгізу және өндірісті басқару бойынша практикалық дағдылары бар тәжірибеге бағытталған маманды дайындауға арналған. Қазақ ұлттық аграрлық зерттеу университеті әзірлеген және бекіткен құжаттар жүйесі болып табылады. Білім беру бағдарламасы базалық міндетті пәндер ретінде «Ғылым тарихы мен философиясы», «Шет тілі (кәсіптік)», «Жоғары мектептің педагогикасы» пәндері және «Басқару психологиясы», «Кәсіпкерліктегі жобаларды басқару», «Конфликтология», «Бизнес шешімдерді модельдеу» мамандықтары бойынша вариативтік бөлімнің базалық пәндері ұсынылған, «Есептеу техникасы және бағдарламалық қамтамасыздандырудағы ғылыми зерттеулер әдіснамасы». «Компьютерлік жүйелерді бағдарламалық қамтамасыз ету» білім беру траекториясы үшін бейіндік пәндер ретінде мынадай пәндер ұсынылды: «Бағдарламалық жүйелерді жобалау технологиясы», «Инженерлік есептердегі математикалық әдістер мен модельдер», «Мәліметтерді талдау технологиясы», «"IoT және жасанды интеллект"», «Автоматтандырылған жүйелерді ақпараттық және бағдарламалық қамтамасыз ету», «Визуалды бағдарламалау құралдарымен бағдарламалық қамтаманы құрастыру», «Жетілдірілген деректер қорлары». Ал «Компьютерлік жүйелерді әкімшілендіру» траекториясы үшін: «Ауыл-шаруашылығы алқаптарының ресурстық әлеуетін бағалау және талдау бойынша қашықтықтан зондтау», «Шешімдерді қабылдауға математикалық және құрылымдық әдістерді қолдану», «Операцияларды зерттеу», «Ақпараттық технологиялар саласындағы

жобаларды басқару», «Компютерлік көру», «Кәсіпорынның желісіне негізгі технологияларын енгізу және пайдалану», «Бірнеше пайдаланушылық дерекқорларды басқару».

Ұсынысты толық қолдайтынын айтты.

Академикалық комитет мүшелері түскен ұсынысты бірауыздан қолдап, университеттің оқу-әдістемелік Кеңесіне ұсынды.

ҚАУЛЫ ЕТТІ:

«IT-технологиялар және автоматтандыру» кафедрасының ұжымымен дайындалған 2024-2028 оқу жылдарына арналған 6В06103 – «Есептеу техникасы және бағдарламалық қамтамасыз ету» білім беру бағдарламасы қарастыру үшін университеттің оқу-әдістемелік Кеңесіне ұсынылсын.

Төраға Ибишев Ө.

Хатшы Дюсенбиева А.Х.

Хаттама көшірмесін растаймын: Дюсенбиева А.Х.

Рецензия

на образовательную программу по направлению подготовки 6В06103-
«Вычислительная техника и программное обеспечение»,
разработанную кафедрой «IT- технологии и автоматизация»
Казахского национального аграрного исследовательского университета
на 2024-2028 учебные годы

В рассматриваемой образовательной программе «6В06103-«Вычислительная техника и программное обеспечение» при построении применен компетентный подход с учетом Казахстанских условий труда, направленный на развитие и становление профессиональных и социальных компетенций у обучающихся. В структуре образовательной программы учтены наличие основных содержательных компонентов в соответствии с требованиями профессиональных стандартов в области информационно-коммуникационных технологий.

Данная образовательная программа (ОП) дает возможность обучающимся получить глубокие знания в области информационных технологий и стать конкурентоспособным, квалифицированным специалистом на современном рынке труда.

Представленная образовательная программа для бакалавриата по направлению подготовки 6В06103 - «Вычислительная техника и программное обеспечение» , разработанная кафедрой «IT-технологий и автоматизация» КазНАИУ в 2024 году обновлена в связи с увеличением кредитов в естественно-научной подготовке бакалавров. В новом ОП кредиты по итоговой аттестации уменьшились с 12 на 8 кредитов и вместо дипломного проекта будут сдавать два комплексных экзамена по направлению подготовки. В связи с введением в университете авторасписания количество аудиторных часов изменилось, также количество кредитов производственных практик на каждом курсе стало 5 кредитов, а на последнем курсе все практики объединили в один профессиональный.

В ОП структура и содержание дисциплин специальности усилились дисциплинами для создания различных Web-приложений, такими как: Структуры данных и программирование , Web-программирование, Разработка web приложения на основе Framework, Технологии разработки клиент-серверных приложений.

В ОП усилены позиции вузовского компонента дисциплинами «Разработка приложений на Python» и «IT -инфраструктура», которые обязательны для изучения всеми студентами, обучающихся по направлению подготовки ИКТ. К этой категории также относятся следующие дисциплины: Высшая математика I, Высшая математика II, Физика, Структуры данных и программирование , Дизайн цифровых схем, Компьютерная организация и ассемблер, Архитектура программного обеспечения, Программная инженерия. Все дисциплины подобраны так, чтобы раскрыть

профессиональные компетенции направления подготовки обучения и соответсвующих профстандартов.

Следует отметить последовательность и логичность в реализации компетентностного подхода в рецензируемой образовательной программе. Авторам ОП в качестве рекомендаций предлагаем увеличить предметы сельхоз уклона по направлению ориентации ВУЗа.

В заключении необходимо отметить, ОП бакалавриата, реализуемая в Казахском национальном аграрном университете по направлению подготовки 6В06103-«Вычислительная техника и программное обеспечение», имеет комплексный и целевой подход для подготовки квалифицированного бакалавра, обладающего необходимыми профессиональными навыками и компетенциями, необходимыми для дальнейшей деятельности по соответствующему направлению. Рецензируемая образовательная программа соответствует заявленному уровню подготовки и может быть использована для подготовки студентов по направлению «6В06103-«Вычислительная техника и программное обеспечение»

Заведующий лабораторией «Автоматика и информационные технологии» в ТОО «Научно-производственный центр агроинженерии», профессор, д.т.н. А. Алтыбаев

Подпись заверена

КАДР БӨЛІМІ
ОТДЕЛ КАДРОВ

Рецензия

на образовательную программу для специальности 6В06103-«Вычислительная техника и программное обеспечение» , разработанную кафедрой «IT- технологии и автоматизация» Казахского национального аграрного исследовательского университета на 2024-2028 годы

Цели настоящей образовательной программы 6В06103-«Вычислительная техника и программное обеспечение» ориентированы на достижение в ходе обучения и воспитания высокого уровня готовности выпускника к самостоятельной жизни. ОП полностью отвечает социальным ожиданиям общества относительно формирования интеллектуальных, личностных и поведенческих качеств, его способностей к продуктивной профессиональной деятельности в современном обществе.

. Представленная образовательная программа (ОП) дает возможность обучающимся получить глубокие знания в области информационных технологий и стать конкурентоспособным, квалифицированным специалистом на современном рынке труда.

При формировании образовательной программы «6В06103-«Вычислительная техника и программное обеспечение» применен компетентный подход с учетом Казахстанских условий труда, направленный на развитие и становление профессиональных и социальных компетенций у обучающихся. Данная образовательная программа соответствует требованиям ГОСО РК от 31 октября 2018 года, профессионального стандарта по ОП Предпринимателей РК «Атамекен», Приказа Министра образования и науки Республики Казахстан от дополнения в приказ МОН РК от 20 апреля 2011 года № 152 «Об утверждении правил организации учебного процесса по кредитной технологии обучения».

В образовательной программе предусмотрены также различные виды практик, влияющих на формирование профессиональных компетенций, практических умений и навыков: после 1-го курса – учебная, после 2,3,4-го курса – производственная, на 4-м курсе – преддипломная практика.

По специальностям бакалавриата студент, согласно ОП, осваивает 215 кредитов теоретического обучения, из них 56 кредитов отводится на дисциплины обязательного компонента общеобразовательных дисциплин, 115 кредитов приходится на базовые и 64 кредитов приходится на профилирующие дисциплины, а так же 129 кредитов на дисциплины компонента по выбору, Таким образом, дисциплины специальности, направленные на подготовку обучающегося по выбранной профессиональной деятельности приравнено к 168 кредитам – что составляет 69,14% от всех кредитов, осваиваемых по ОП.

Рассматриваемые в образовательной программе дисциплины в полной мере способствуют формированию профессиональных компетенций бакалавра по созданию и управлению информационными ресурсами и компьютерными системами. Отдельные новые дисциплины модулей включены в программу, в целях реализации замечаний экспертов ЕСУВО, это- Структуры данных и программирование , Web программирование, Разработка web приложения на основе Framework, Технологии разработки клиент-серверных приложений, Нейронные сети в современном представлении. С целью выполнения рекомендаций работодателей в программу включены такие дисциплины как: Разработка приложений на Python, Блочное программирование, Моделирование в планировании с/х производства

Представленная образовательная программа обеспечивает социально-гуманитарное образование на основе знания законов социально-экономического развития общества, современной истории Казахстана, государственного, русского и английского языков как средств межнационального общения; углубленных знаний естественно-научного, общетехнического и экономического характера как фундамента профессионального образования. Дает возможность приобретения глубоких теоретических знаний и

практического опыта на различных типах компьютерных систем, современных информационных технологий, интерактивных графических средств и мобильных приложений, применение современных языков программирования для создания различных Web-приложений, использование цифровых методов обработки информации для решения прикладных задач, инструментов программной инженерии и различных технологий создания баз данных.

Структура программы, в целом, последовательна и логична. Включённые в программу дисциплины раскрывают сущность актуальных на сегодняшний день проблем в области информационных технологий. В качестве рекомендаций разработчикам предлагаем раскрывать все грани профессиональных стандартов не только с новыми предметами, а с новыми технологиями в области ИКТ для развития агропромышленного производства в виде новых тем в рассматриваемые дисциплины.

В целом, образовательная программа по направлению подготовки «6В06103-«Вычислительная техника и программное обеспечение», разработанная кафедрой «IT-технологии и автоматизация» Казахского национального аграрного исследовательского университета соответствует заявленному уровню подготовки и может быть использована для подготовки студентов по направлению «6В06103-«Вычислительная техника и программное обеспечение»

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