



**CURRICULUM**  
of Educational Program on enrollment for 2024-2025 academic year

Educational program 6B06102 - "Computer Science"  
Group of educational programs B057 - "Information Technology"

Form of study: full-time

Duration of study: 4 years

Academic degree: Bachelor in Information and Communication Technology

Discipline code	Name of disciplines	Cycle	Total amount in credits	ECTS credits	ABET credits	Total hours	classroom volume of lek/lab/p	SIS (including TSIS) in	Form of control	Allocation of face-to-face training based on courses and semesters															
										I course		II course		III course		IV course									
										1 semester	2 semester	3 semester	4 semester	5 semester	6 semester	7 semester	8 semester								
<b>CYCLE OF GENERAL EDUCATION DISCIPLINES (GED)</b>																									
<b>M-1. Module of language training</b>																									
LNG108	Foreign language	GED, RC	5	5	3	150	0/0/3	105	E	5															
LNG108	Foreign language	GED, RC	5	5	3	150	0/0/3	105	E		5														
LNG104	Kazakh (russian) language	GED, RC	5	5	3	150	0/0/3	105	E	5															
LNG104	Kazakh (russian) language	GED, RC	5	5	3	150	0/0/3	105	E		5														
<b>M-2. Module of physical training</b>																									
KFK101-104	Physical culture	GED, RC	8	8	8	240	0/0/8	120	Difered it	2	2	2	2												
<b>M-3. Module of information technology</b>																									
CSE843	Information and Communication technologies	GED, RC	5	5	3	150	2/1/0	105	E			5													
<b>M-4. Module of socio-cultural development</b>																									
HUM137	History of Kazakhstan	GED, RC	5	5	3	150	1/0/2	105	SE				5												
HUM132	Philosophy	GED, RC	5	5	3	150	1/0/2	105	E											5					
HUM120	Module of socio-political knowledge (sociology, political science)	GED, RC	3	3	2	90	1/0/1	60	E												3				
HUM134	Module of socio-political knowledge (cultural studies, psychology)	GED, RC	5	5	3	150	2/0/1	105	E												5				
<b>M-5. Module of anti-corruption culture, ecology and life safety base</b>																									
HUM136	Fundamentals of anti-corruption culture and law	GED, EC	5	5	3	150	2/0/1	105	E																
MNG489	Fundamentals of economics and entrepreneurship																								
ELC577	Fundamentals of scientific research methods																								
CHE656	Ecology and life safety																								
MNG564	Basics of Financial Literacy																								
<b>CYCLE OF BASIC DISCIPLINES (BD)</b>																									
<b>M-6. Module of physical and mathematical training</b>																									
MAT101	Mathematics I	BD, UC	5	5	3	150	1/0/2	105	E	5															
PHY468	Physics	BD, UC	5	5	3	150	1/1/1	105	E	5															
MAT102	Mathematics II	BD, UC	5	5	3	150	1/0/2	105	E		5														
CSE603	Discrete Mathematics	BD, UC	5	5	3	150	2/0/1	105	E			5													
<b>M-7. Module of basic training</b>																									
CSE554	Algorithmization and programming basics	BD, UC	4	4	3	120	1/1/1	75	E	4															
CSE662	Introduction to Web programming	BD, UC	5	5	3	150	1/1/1	105	E	5															
CSE678	Algorithms and Data Structures	BD, UC	5	5	3	150	1/1/1	105	E		5														
CSE127	Object oriented programming	BD, UC	5	5	3	150	1/1/1	105	E				5												
CSE676	Computer architecture and consistency of operations	BD, UC	5	5	3	150	1/1/1	105	E				5												
CSE608	Mathematics and Statistics	BD, EC	5	5	3	150	2/1/0	105	E																
CSE831	Fundamentals of Artificial Intelligence						1/0/2																		
MNG562	Legal regulation of intellectual property						2/0/1																		
CSE844	Artificial intelligence	BD, UC	5	5	3	150	2/1/0	105	E				5												
CSE845	Application design patterns	BD, UC	4	4	3	120	1/0/2	75	E				4												
CSE679	Databases	BD, UC	5	5	3	150	1/1/1	105	E				5												
CSE869	Operating systems	BD, UC	5	5	3	150	2/1/0	105	E				5												
SEC162	Information security and data protection	BD, UC	5	5	3	150	2/1/0	105	E											5					
CSE122	Computer Networks	BD, UC	5	5	3	150	1/1/1	105	E					5											
CSE847	Data Visualization	BD, EC	5	5	3	150	1/0/2	105	E																
MAT456	Numerical methods and programming						1/0/2																		
MNG563	Fundamentals of sustainable development and ESG projects in Kazakhstan						2/0/1																		
AAP173	Practical training	BD, UC	2	2	2							2													
<b>CYCLE OF PROFILE DISCIPLINES (PD)</b>																									
<b>M-8. Module of professional activity</b>																									
CSE860	Web application development	PD, EC	5	5	3	150	1/0/2	105	E				5												
CSE674	Functional Programming						2/1/0																		
CSE632	Enterprise Web Programming	PD, UC	4	4	3	120	1/1/1	75	E											4					
CSE513	UX/UI design	PD, UC	5	5	3	150	1/1/1	105	E				5												
CSE178	Machine Learning	PD, EC	5	5	3	150	1/1/1	105	E																
CSE636	Mobile Programming																								
CSE537	Computer graphics																								



CS4333	Design & Analysis of Algorithms	MR Core	3															3		
GE-7 / GE1356	GE-7 Gateway Education – GE (7) GE1356 - Introduction to Data Science	GE	3															3		
CS-E / CS1483	CS Elective (1) Multimodal Interface Design	MR Elective	3															3		
CS-E / CS4296	CS Elective (2) Other Electives Cloud Computing	MR Elective	3															3		
CS-E / CS4182	CS Elective (3) Computer Graphics	MR Elective	3																3	
CS-E / CS4486	CS Elective (4) Artificial Intelligence Stream Artificial Intelligence	MR Elective	3																3	
CS-E / CS3481	CS Elective (5) Data Science Stream Fundamentals of Data Science	MR Elective	3																3	
GE-8 / GE2129	Gateway Education – GE (8) (Arts and Humanities) Psychology for Young Professionals	GE	3																3	
CS4514	Project	MR Core	3																	3
CS-E / CS4487	CS Elective (6) Artificial Intelligence Stream Machine Learning	MR Elective	3																	3
EN4262	English Communication Skills for Computing	MR Core	2																	2
DR-2 / CB2500	Department Required Supporting: @CB / ^GE Course - DR (2) Information Management	MR Core	3																	3
GE-9 / GE2259	GE-9 Gateway Education – GE (9) Study of Societies, Social and Business Organisations GE2259 - Technology Ventures: From ICT Innovation to Enterprise	GE	3																	3
CS-E / CS4480	CS-E CS Elective (7) Data Science Stream CS4480 Data-Intensive Computing	MR Elective	3																	3
GE1501	[GE] Chinese Civilization – History & Philosophy – GE (5)	GE	3																	3
CS-E / CS4186	CS-E CS Elective (8) Artificial Intelligence Stream CS4186 Computer Vision & Image Processing	MR Elective	3																	3
GE-10 / GE2343	GE-10 Gateway Education – GE (10) Science and Technology GE2343 - Data Visualization	GE	3																	3
CS-E / CS4187	CS-E CS Elective (9) Artificial Intelligence Stream CS4187 Computer Vision & Interactivity	MR Elective	3																	3
CS-E	CS Elective (10)	MR Elective	3																	3
CS4514	Project	MR Core	6																	6
<b>Total based on UNIVERSITY:</b>										15	12	15	22	15	12	20	18			
										27		37		27		38				

Note:  
Gateway Education GE  
College requirement CR  
Major requirement Core MR Core  
Major requirement Elective MR  
Elective Elective

Cycle code	Cycles of disciplines	Number of credits for the entire period of study				
		required component (RC)	university component (UC)	elective component (EC)	Total ECTS	Total ABET
GED	Cycle of general education disciplines	51		5	56	37
BD	Cycle of basic disciplines		75	10	85	53
PD	Cycle of profile disciplines		39	52	91	59
	<b>Total for theoretical training:</b>				<b>232</b>	<b>149</b>
FA	Final attestation				8	8
	<b>TOTAL:</b>				<b>240</b>	<b>157</b>

Decision of the Academic Council of KazNRTU named after K.Satpayev. Protocol №12 dated "22" April 2024 y.

Decision of the Educational and Methodological Council of KazNRTU named after K.Satpayev. Protocol №6 dated "19" April 2024 y.

Decision of the Academic Council of the Institute of Automation and Information Technology. Protocol №8 dated "29" February 2024 y.

Vice-Rector for Academic Affairs

Acting Director of the Institute of A&IT

Head of the Department of Software Engineering

Specialty Council representative from employers, President of the Association of Innovative Companies of the SEZ "PIT", Ph.D.

Uskenbayeva R.K.

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Abdoldina F.N.

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