NON-PROFIT JOINT STOCK COMPANY
"KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY NAMED AFTER K.I. SATBAYEV"

«APPROVED»
Decision of the Academic Council
NPJSC«KazNRTU
named after K.Satbayev»
dated 06.03.2025 Minutes № 10

WORKING CURRICULUM

Academic year	**2025-2026 (Autumn, Spring)**
Group of educational programs	**B063 - "Electrical engineering and automation"**
Educational program	**6B07104 - "Electronic and Electrical Engineering"**
The awarded academic degree	**Bachelor of engineering and technology**
Form and duration of study	**full time - 4 years**

Discipline code	Name of disciplines	Block	Cycle	Total ECTS credits	Total hours	lek/lab/pr Contact hours	in hours SIS (including TSIS)	Form of control	Allocation of face-to-face training based on courses and semesters								Prerequisites
									1 course		2 course		3 course		4 course		
									1 sem	2 sem	3 sem	4 sem	5 sem	6 sem	7 sem	8 sem	
CYCLE OF GENERAL EDUCATION DISCIPLINES (GED)																	
M-5. Module of anti-corruption culture, ecology and life safety base																	
CHE656	Ecology and life safety	1	GED, CCH	5	150	30/0/15	105	E			5						
HUM136	Fundamentals of anti-corruption culture and law	1	GED, CCH	5	150	30/0/15	105	E			5						
MNG489	Fundamentals of economics and entrepreneurship	1	GED, CCH	5	150	30/0/15	105	E			5						
ELC577	Fundamentals of scientific research methods	1	GED, CCH	5	150	30/0/15	105	E			5						
MNG564	Basics of Financial Literacy	1	GED, CCH	5	150	30/0/15	105	E			5						
M-1.Module of language training																	

LNG108	Foreign language		GED, RC	5	150	0/0/45	105	E	5								
LNG104	Kazakh (russian) language		GED, RC	5	150	0/0/45	105	E	5								
LNG108	Foreign language		GED, RC	5	150	0/0/45	105	E		5							
LNG104	Kazakh (russian) language		GED, RC	5	150	0/0/45	105	E		5							
M-2.Module of physical training																	
KFK101	Physical culture I		GED, RC	2	60	0/0/30	30	E	2								
KFK102	Physical culture II		GED, RC	2	60	0/0/30	30	E		2							
KFK103	Physical culture III		GED, RC	2	60	0/0/30	30	E			2						
KFK104	Physical culture IV		GED, RC	2	60	0/0/30	30	E				2					
M-3.Module of information technology																	
CSE677	Information and communication technology		GED, RC	5	150	30/15/0	105	E				5					
M-4.Module of socio-cultural development																	
HUM137	History of Kazakhstan		GED, RC	5	150	15/0/30	105	GE	5								
HUM132	Philosophy		GED, RC	5	150	15/0/30	105	E			5						
HUM120	Module of socio-political knowledge (sociology, political science)		GED, RC	3	90	15/0/15	60	E			3						
HUM134	Module of socio-political knowledge (cultural studies, psychology)		GED, RC	5	150	30/0/15	105	E				5					
CYCLE OF BASIC DISCIPLINES (BD)																	
M-6.Module of physical and mathematical training																	
MAT101	Mathematics I		BD, UC	5	150	15/0/30	105	E	5								
PHY111	Physics I		BD, UC	5	150	15/15/15	105	E	5								
PHY112	Physics II		BD, UC	5	150	15/15/15	105	E		5							PHY111
MAT102	Mathematics II		BD, UC	5	150	15/0/30	105	E		5							MAT101

MAT423	Mathematics		BD, UC	5	150	15/0/30	105	E			5						
M-7.Module of basic training																	
GEN429	Engineering and computer graphics		BD, UC	5	150	15/0/30	105	E	5								
ELC589	Theoretical Foundations of Electrical Engineering I		BD, UC	6	180	15/15/15	135	R			6						
ELC587	Simulation software	1	BD, CCH	5	150	15/15/15	105	R			5						
ELC588	Simulation of electronic circuits in MatLab and other software products	1	BD, CCH	5	150	15/15/15	105	R			5						
MNG563	Fundamentals of sustainable development and ESG projects in Kazakhstan	1	BD, CCH	5	150	30/0/15	105	E			5						
ELC590	Theoretical Foundations of Electrical Engineering II		BD, UC	5	150	15/15/15	105	R				5					
ELC544	Physical fundamentals of electronics		BD, UC	5	150	15/15/15	105	E				5					
ROB504	High-level Programming	1	BD, CCH	5	150	30/15/0	105	E					5				
ROB505	Methods of Computation and Programming	1	BD, CCH	5	150	15/15/15	105	E					5				
CSE831	Fundamentals of Artificial Intelligence	1	BD, CCH	5	150	15/0/30	105	E					5				
ELC802	Inclusive technologies and universal design in engineering systems	1	BD, CCH	5	150	30/0/15	105	E					5				
M-8.Module of electronics and artificial intelligence																	
ELC479	Introduction to Electronic Science and Engineering		BD, UC	4	120	30/0/15	75	E		4							
ELC573	Fundamentals of electronics and measuring technique		BD, UC	5	150	15/15/15	105	E				5					
ELC591	Electronics and circuitry		BD, UC	5	150	15/15/15	105	R					5				
ELC100	Fundamentals of optoelectronics		BD, UC	5	150	15/0/30	105	E					5				
ELC574	Electrical devices		BD, UC	5	150	30/0/15	105	E						5			
ROB411	Embedded system programming	1	BD, CCH	5	150	15/15/15	105	E						5			
ROB195	Programming for microcontrollers	1	BD, CCH	5	150	30/15/0	105	E						5			
MNG562	Legal regulation of intellectual property	1	BD, CCH	5	150	30/0/15	105	E						5			
M-9.Module of electric drives and measuring devices																	
ELC578	Digital control of the electric drive	1	BD, CCH	4	120	30/0/15	75	E							4		

ELC579	Frequency control of the electric drive	1	BD, CCH	4	120	30/0/15	75	E							4		
M-10.Module of production automation																	
AUT424	Basics of automation		BD, UC	5	150	30/15/0	105	E					5				
ELC581	Power electronics in automation		BD, UC	4	120	30/0/15	75	E					4				
ELC633	Embedded control systems		BD, UC	5	150	30/15/0	105	E						5			
M-11.Module of creativity development																	
ELC492	TRIZ in solving engineering problems		BD, UC	6	180	30/0/30	120	E							6		
M-13.Module of professional activity																	
AAP173	Practical training		BD, UC	2				R		2							
CYCLE OF PROFILE DISCIPLINES (PD)																	
M-8.Module of electronics and artificial intelligence																	
ELC685	Technology Internet of things		PD, UC	5	150	30/0/15	105	E						5			
ELC677	Electronic sensors and transducers	2	PD, CCH	4	120	30/0/15	75	E						4			
ELC807	Measuring and control devices in communication systems	2	PD, CCH	4	120	15/15/15	75	E						4			
ELC585	Digital circuitry	1	PD, CCH	5	150	30/15/0	105	E							5		
ELC565	Electronic engineering	1	PD, CCH	5	150	30/0/15	105	E							5		
ELC596	Security alarm systems	1	PD, CCH	6	180	30/0/15	135	E								6	
ELC597	Design of security systems	1	PD, CCH	6	180	30/0/15	135	E								6	
M-9.Module of electric drives and measuring devices																	
ELC580	Basics of electric drive		PD, UC	4	120	15/15/15	75	R						4			
ELC634	Microprocessor systems	2	PD, CCH	5	150	30/15/0	105	E							5		
AUT411	Linear System of Automatic Control	2	PD, CCH	5	150	15/15/15	105	E							5		
ELC524	Programmable logic integrated circuits		PD, UC	5	150	30/0/15	105	E								5	
ELC631	Dynamics and control of electric drives	1	PD, CCH	4	120	30/15/0	75	E								4	

ELC632	Design and management of electrotechnical devices	1	PD, CCH	4	120	30/15/0	75	E								4	
M-10.Module of production automation																	
ELC584	Electric measuring instruments of automation		PD, UC	5	150	30/0/15	105	E					5				
ELC642	Voltage and energy		PD, UC	6	180	30/0/30	120	C							6		
ELC582	Technical means of automation and control	1	PD, CCH	6	180	30/0/15	135	E								6	
ELC635	Automation systems	1	PD, CCH	6	180	30/0/30	120	E								6	
M-13.Module of professional activity																	
AAP102	Production practice I		PD, UC	2				R				2					
AAP183	Production practice II		PD, UC	3				R						3			
M-14.Module of final attestation																	
ECA103	Final examination		FA	8												8	
M-12.Module of "R&D"																	
ELC594	Design of electrotechnical devices	1	PD, CCH	5	150	15/15/15	105	R							5		
ELC595	Design of electronic means	1	PD, CCH	5	150	15/15/15	105	R							5		
Additional type of training (ATT)																	
AAP500	Military training																
Total based on UNIVERSITY:									32	28	31	29	29	31	31	29	
									60		**60**		**60**		**60**		

Number of credits for the entire period of study

Cycle code	Cycles of disciplines	Credits			
		Required component (RC)	University component (UC)	Component of choice (CCH)	Total
GED	Cycle of general education disciplines	51	0	5	56
BD	Cycle of basic disciplines	0	92	19	111
PD	Cycle of profile disciplines	0	30	35	65
Total for theoretical training:		**51**	**122**	**59**	**232**
FA	Final attestation				8
TOTAL:					**240**

Decision of the Educational and Methodological Council of KazNRTU named after K.Satpayev. Minutes № 3 dated 20.12.2024

Decision of the Academic Council of the Institute. Minutes № 1 dated 22.11.2024