KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY named after K.I.SATPAYEV

SATBAYEV UNIVERSITY

CURRICULUM
of Educational Program on enrollment for 2022-2023 academic year

Educational program 6B07113 - "Robotics and mechatronics"
Group of educational programs B063 - "Electrical engineering and automation"

Form of study: full-time — Duration of study: 4 years — Academic degree: Bachelor of Engineering and Technology

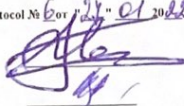| Discipline code	Name of disciplines	Cycle	Total amount in credits	Total hours	Classroom amount lec/lab/pr	SIS (including TSIS) in hours	Form of control	1 semester	2 semester	3 semester	4 semester	5 semester	6 semester	7 semester	8 semester
						I course		II course		III course		IV course			
M-1. Module of language training															
LNG 108	English language	GED, RC	10	300	0/0/6	210	E	5	5						
LNG 104	Kazakh (Russian) language	GED, RC	10	300	0/0/6	210	E	5	5						
M-2. Module of physical training															
KFK 101-104	Physical Culture	GED, RC	8	240	0/0/8	120	Diforedit	2	2	2	2				
M-3. Module of information technology															
CSE 677	Information and communication technologies (in English)	GED, RC	5	150	2/1/0	105	E			5					
GEN 429	Engineering and computer graphics	BD, UC	5	150	1/0/2	105	Э		5						
M-4. Module of socio-cultural development															
HUM 137	History of Kazakhstan	GED, RC	5	150	1/0/2	105	SE	5							
HUM 132	Philosophy	GED, RC	5	150	1/0/2	105	E		5						
HUM 120	Socio-political knowledge module (sociology, politology)	GED, RC	3	90	1/0/1	60	E			3					
HUM 134	Socio-political knowledge module (culturology, psychology)	GED, RC	5	150	2/0/1	150	E				5				
M-5. Module of anti-corruption culture, ecology and life safety base															
HUM 133	Fundamentals of anti-corruption culture	GED, CCH	5	150	2/0/1	150	E				5				
MNG 488	Fundamentals of Entrepreneurship and Leadership														
CHE 656	Ecology and life safety														
M-6. Module of physical and mathematical training															
MAT 101	Mathematics I	BD, UC	5	150	1/0/2	105	E	5							
MAT 102	Mathematics II	BD, UC	5	150	1/0/2	105	E		5						
MAT 103	Математика III	BD, UC	5	150	1/0/2	105	Э			5					
M-7. Module of physical and chemical preparation															
PHY 111	Physics I	BD, UC	5	150	1/1/1	105	E	5							
CHE846	General chemistry	BD, UC	4	120	1/1/1	75	E	4							
PHY 112	Physics II	BD, UC	5	150	1/1/1	105	E		5						
M-8. Robotics Module															
2201	Elective	BD, EC	5	150		105	E			5					
2202	Elective	BD, EC	5	150		105	E				5				
M-9. Electronics and Circuit Engineering module															
ROB538	Fundamentals of Electromechanics and electronics	BD, UC	6	180	2/1/1	120	E			6					
ROB154	Electronics	BD, UC	5	150	1/1/1	105	E				5				
ROB573	Integrated and microprocessor circuitry	BD, UC	5	150	2/1/0	105	E					5			
M-10. Robot Mechanics Module															
ROB503	Robot mechanics	BD, UC	5	150	2/0/1	105	E				5				
ROB173	Mechanics of manipulators	BD, UC	5	150	2/0/1	105	E					5			
ROB534	Mechanics of controlled machines	BD, UC	5	150	2/0/1	105	E						5		
M-11. Robot Control System Module															
ROB515	Basics of automation	BD, UC	5	150	2/1/0	105	E					5			
3203	Elective	BD, EC	5	150		105	E					5			
3204	Elective	BD, EC	4	120	1/1/1	75	E						4		
3206	Elective	BD, EC	6	180	1/1/2	120	E							6	
M-12. Measurement and power supply module															
ROB187	Fundamentals of information and measurement technologies	BD, UC	5	150	2/1/0	105	E					5			
ROB574	Power sources	PD, UC	4	120	1/1/1	75	E						4		
4302	Elective	PD, EC	5	150		105	E							5	
M-13. Module of robotic systems															
ROB535	Engineering thermodynamics and electrodynamics	PD, UC	5	150	2/0/1	105	E						5		
ROB552	Embedded systems in robotics	PD, UC	6	180	1/1/2	120	E							6	
4301	Elective	PD, EC	5	150		105	E							5	
4303	Elective	PD, EC	6	180		120	E							6	
M-14.Modeling module															
ROB550	Programming for engineers with MATLAB	PD, UC	4	120	1/1/1	75	E						4		
4305	Elective	PD, EC	5	150		105	E								5
4306	Elective	PD, EC	5	150		105	E								5
M-15. R&D модуль															
ROB527	Fundamentals of research methodology	BD, UC	5	150	2/0/1	105	E					5			
3205	Elective	BD, EC	5	150		105	E						5		
4304	Elective	PD, EC	5	150		105	E							5	
4307	Elective	PD, EC	5	150		105	E								5
M-16. Practice-oriented module															
AAP179	Educational practice	BD, UC	2							2					
AAP174	Industrial practice I	PD, UC	2									2			
AAP193	Industrial practice II	PD, UC	3											3	
M-17. Module of final certification															
ECA103	Final examination	FC	12												12
M-18. Module of additional types of training															
								31	29	31	29	30	30	33	27
									60		60		60		60

Total based on UNIVERSITY:

Cycle code	Cycles of disciplines	Number of credits for the entire period of study			
		Credits			
		required component (RC)	university component (UC)	component of choice (CCB)	Total
GED	Cycle of general education disciplines	51		5	56
BD	Cycle of basic disciplines		82	30	112
PD	Cycle of profile disciplines		24	36	60
	Total for theoretical training:	*51*	*106*	*71*	*228*
FA	final attestation	12			12
	TOTAL:	63	106	71	240

Decision of the Academic Council of Kazntu named after K.Satpayev. Protocol №*3* от "*28*" *04* 20*22*г.

Decision of the Educational and Methodological Council of Kazntu named after K.Satpayev. Protocol № *7* от "*26* *04* 20*22*г.
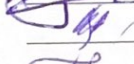
Decision of the Academic Council of the Institute of A&IT. Protocol № *6* от "*27*" *01* 20*22*г.

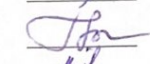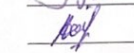|	
Vice-Rector for Academic Affairs	B.A. Zhautikov
Director of the Institute of Automation and Information Technology	R.K. Uskenbayeva
Head of the Department "Robotics and technical means of automation"	K.A. Ozhikenov
Specialty Council representative from employers	A.K. Dzhumagulov

SATBAYEV UNIVERSITY

ELECTIVE DISCIPLINES for 2022-2023 academic year enrolment
Educational program 6B07113 - Robotics and mechatronics
Group of educational programs B063 - Electrical engineering and automation

Full-time study　　　　Study duration : 4 years　　　　Academic degree: bachelor of engineering and technology

Year of study	Elective code according to the curriculum	Discipline code	Name of disciplines	Term	Cycle	Credits	Total hours	lek/lab/pr	SRS (including SRSP) in hours
			Robotics Module						
2201		ROB185	Industrial Robotics	3	BD, EC	5	150	2/0/1	105
		ROB553	Service robotics					2/0/1	
2202		ROB523	Phytomorphic and anthropomorphic robotics	4	BD, EC	5	150	2/0/1	105
		ROB511	Autonomous mobile robots					2/0/1	
			Robot Control System Module						
3203		ROB195	Programming for microcontrollers	5	BD, EC	5	150	2/1/0	105
		ROB504	Programming in a high-level language					2/1/0	
3204		ROB544	Microprocessor control devices of robots	6	BD, EC	4	120	1/1/1	75
		ROB545	Microcontroller control systems					1/1/1	
3206		ROB570	Robot management	7	BD, EC	6	180	1/1/2	120
		ROB571	Control and dynamic systems					1/1/2	
			Measurement and power supply module						
4302		CSE577	Measuring instrument accuracy	7	PD, EC	5	150	2/1/0	105
		ROB189	Control and measuring Instrumentation					2/1/0	
			Robotic systems module						
4301		ROB139	Sensor systems in robotics	7	PD, EC	5	150	2/1/0	105
		ROB138	Touch electronics, sensors					2/1/0	
4303		ROB548	Robot drives	7	PD, EC	6	180	1/1/2	120
		ROB549	Hydropneumatic drives of robots					1/1/2	
			Simulation module						
4305		ROB551	Simulation of dynamic systems	8	PD, EC	5	150	1/1/1	105
		ROB168	Modeling of measuring systems					2/1/0	
4306		ROB144	Machine Learning Theory and Neural Networks	8	PD, EC	5	150	2/1/0	105
		ROB126	Fuzzy logic and neural networks					2/1/0	
			R&D module						
3205		ROB141	Statistical Methods in Engineering Research	6	BD, EC	5	150	2/0/1	105
		ROB153	Fundamentals of engineering creativity					2/0/1	
4304		ROB109	Electronic circuit design	7	PD, EC	5	150	2/1/0	105
		ROB540	Capstone research project 1					0/0/3	
4307		ROB166	Robot design	8	PD, EC	5	150	2/1/0	105
		ROB541	Capstone research project 2					0/0/3	

Number of credits in elective disciplines for the entire period of study	
Cycles of disciplines	Credits
Cycle of basic disciplines (BD)	30
Cycle of major disciplines (PD)	36
TOTAL:	66

Decision of the Academic Council of the Institute_____ . Protocol № 6 от " 27 " 01 20 22 y.

Head of the Department "Robotics and technical means of automation" _____ K.A. Ozhikenov

Specialty Council representative from employers _____ A.K. Dzhumagulov