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

SATBAYEV UNIVERSITY

APPROVED
Chairman of the Board
Rector of KazNRTU named after K.I.Satbayev
M.M. Begentayev
«29» 09 2023 г.

CURRICULUM

of Educational Program on enrollment for 2024-2025 academic year
Educational program 6B07130 - "Mechanical Engineering and Modeling"
Group of educational programs in 064 - "Mechanics and metalworking"

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 volume of lek/lab/pr	SIS (including TSIS) in hours	Form of control	Allocation of face-to-face training based on courses and semesters							
								I course		II course		III course		Ivcourse	
								1 term	2 term	3 term	4 term	5 term	6 term	7 term	8 term
CYCLE OF GENERAL EDUCATION DISCIPLINES (OOD)															
M-1. Language Training module															
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. Physical training module															
KFK 101-104	Physical Culture	GED, RC	8	240	0/0/8	120	Difcredit	2	2	2	2				
M-3. Information Technology module															
CSE 677	Information and communication technologies (in English)	GED, RC	5	150	2/1/0	105	E				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	Module of socio-political knowledge (sociology, political science)	GED, RC	3	90	1/0/1	60	E				3				
HUM 134	Module of socio-political knowledge (cultural studies, psychology)		5	150	2/0/1	105	E			5					
M-5. Module fundamentals of anti-corruption culture, ecology and life safety															
HUM 136	Fundamentals of Anti-Corruption Culture and Law	GED, CCH	5	150	2/0/1	105	E			5					
MNG 489	Fundamentals of Economics and Entrepreneurship														
MSM500	Scientific research methods														
CHE 656	Ecology and life safety														
MNG564	Basics of Financial Literacy														
CYCLE OF BASIC DISCIPLINES (DB)															
M-6. Module of physical and mathematical training															
MAT 169	Mathematical Analysis I	BD, UC	5	150	1/0/2	105	E	5							
PHY 469	Physics I: Molecular Physics. Thermodynamics	BD, UC	5	150	1/1/1	105	E	5							
MAT189	Linear algebra and analytic geometry	BD, UC	5	150	1/0/2	105	E	5							
MAT 170	Mathematical Analysis II	BD, UC	5	150	1/0/2	105	E		5						
PHY 471	Physics II: Electricity and Magnetism. Nuclear physics	BD, UC	5	150	1/1/1	105	E		5						
MAT171	Mathematical Analysis III	BD, UC	5	150	1/0/2	105	E			5					
MAT110	Ordinary differential equations	BD, UC	5	150	1/0/2	105	E			5					
MAT172	Mathematical Analysis IV	BD, UC	5	150	1/0/2	105	E				5				
MAT448	Equations of mathematical physics	BD, UC	5	150	1/0/2	105	E					5			
M-7. Module of basic training in engineering mechanics and Modeling															
GEN 177	Engineering and computer graphics	BD, UC	5	150	1/1/1	105	E	5							
GEN409	Statics and kinematics	BD, UC	5	150	1/0/2	105	E			5					
GEN198	Dynamics	BD, UC	5	150	1/0/2	105	E				5				
CHE495	General chemistry	BD, UC	5	150	1/1/1	105	E					5			
GEN413	Theory and design of mechanisms and machines	BD, UC	5	150	1/1/1	105	E					5			
GEN199	Engineering thermodynamics	BD, UC	5	150	1/0/2	105	E					5			
GEN414	Numerical methods and programming	BD, UC	5	150	1/1/1	105	E					5			
GEN404	Fluid and gas mechanics	BD, UC	5	150	1/1/1	105	E						5		
GEN405	Solid state mechanics	BD, UC	5	150	1/0/2	105	E						5		
GEN504	Computational hydromechanics and modeling	BD, UC	5	150	1/0/2	105	E						5		
GEN185	Statistical Mechanics	BD, CCH			1/1/1										
GEN407	The strength and reliability of machines				1/1/1										
CSE831	Fundamentals of Artificial Intelligence			150	1/0/2	105	E					5			
MNG563	Fundamentals of sustainable development and ESG projects in Kazakhstan				2/0/1										
MNG562	Legal regulation of intellectual property				2/0/1										

GEN447	Modeling and design of mechanical systems	BD, UC	5	150	1/1/1	105	E							5		
GEN448	Modeling and design of thermal systems	BD, UC	5	150	1/1/1	150	E								5	
GEN100	Educational practice	BD, UC	2						2							
CYCLE OF PROFILE DISCIPLINES (PD)																
M-8. Module of professional training in engineering mechanics and Modeling																
GEN426	Strength of materials	PD, UC	5	150	1/1/1	105	E				5					
GEN505	Object oriented programming	PD, UC	5	150	1/1/1	105	E							5		
GEN419	Design of machine elements and parts	PD, UC	5	150	1/1/1	105	E						5			
GEN508	Dynamics of Machines and Computer Analysis	PD, UC	4	120	1/1/1	75	E						4			
GEN509	Control of Dynamic Systems				1/1/1											
GEN512	Filtration theory and applied problems	PD, CCH	4	120	1/2/0	75	E						4			
GEN511	Finite volume method in fluid mechanics				1/2/0											
GEN510	Basics of heat transfer	PD, UC	5	150	1/0/2	105	E							5		
GEN421	Introduction to Robotics	PD, UC	5	150	1/1/1	105	E							5		
GEN160	The finite element method in engineering	PD, CCH	5	150	1/1/1	105	E							5		
MSM468	Interchangeability and technical measurements	PD, CCH	5	150	1/1/1	105	E							5		
GEN425	Computational mechanics				1/1/1											
GEN462	Machine learning and data analysis in engineering	PD, CCH	6	180	2/1/1	120	E								6	
GEN446	Renewable Energy Systems				2/1/1											
GEN438	3D Printing of Machine Elements	PD, CCH	6	180	2/1/1	120	E								6	
GEN442	Biofluid Mechanics				2/1/1											
GEN506	Laboratory: Fluid Flowes	PD, UC	4	120	0/3/0	75	E								4	
GEN507	Laboratory: Heat Transfer				0/3/0											
GEN500	Industrial practice I	PD, UC	2								2					
GEN501	Industrial practice II	PD, UC	3										3			
M-9. Module of final certification																
ECA108	Writing and defense of the thesis	FA	8												8	
M-10. Module of additional types of training																
AAP500	Military training	DVO	0													
Total based on UNIVERSITY:								32	29	27	32	30	31	30	29	
								61		**59**		**61**		**59**		

Number of credits for the entire period of study					
Cycle code	Cycles of disciplines	Credits			
		required component (OK)	university component	component of choice (CCH)	Total
GED	Cycle of general education disciplines	51		5	56
BD	Cycle of basic disciplines		107	5	112
PD	Cycle of profile disciplines		34	30	64
	Total for theoretical training:	*51*	*141*	*40*	*232*
FA	Final certification	8			8
	Total:	59	141	40	240

Decision of the Academic Council of Kazntu named after K.Satpayev. Protocol №12 от "22" 04 2024 y.

Decision of the Educational and Methodological Council of Kazntu named after K.Satpayev. Protocol №6 от "19" 04 2024 y.

Decision of the Academic Council of the Institute IEiM. Protocol №4 от "19" 01 2024 y.

Vice-Rector for Academic Affairs — **R.K. Uskenbayeva**

Director of the Institute of Energy and Mechanical Engineering — **K.K. Yelemessov**

Head of department "Mechanical Engineering" — **A. Kaltayev**

Representative of Specialty council — **A.K. Tuleshov**