



MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN
KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY named after K. I. SATBAYEV



WORKING CURRICULUM for 2019-2020 academic year admission
Educational program 6B07106 - "Mechanical Engineering"
Group of Educational programs B064 - "Mechanics and metal working"

Full-time study Study duration : 4 years

Academic degree: bachelor of Engineering and Technology

Year of study	Code	Name of discipline	Cycle	Total Credits	Total hours	lec/lab/pr	IWS (including IWS1), in hours	Code	pre-requisites
1 semester (fall 2019)									
1	LNG 1051	Beginner (A1)	G	6	180	0/0/3	135	S4	Diagnostica n. Test
	LNG 1052	Elementary English (A1)							
	LNG 1053	General English 1 (A2)							
	LNG 1054	General English 2 (A2)							
	LNG 1055	Academic English (B1)	G	4	120	0/0/2	90	S1	Diagnostica n. Test
	LNG1056	Business English (B2)							
	LNG1012	Kazakh (Russian) language (A2)							
	LNG1012.1	Academic Kazakh (Russian) language (B1)							
	LNG1012.2	Business Kazakh (Russian) language (B2)							
	MAT100	Algebra and beginning of mathematical analysis	B	6	180	1/0/2	135	S2	Diagnostica n. Test
	MAT101	Mathematics I							
	PHY400	Physics	B	6	180	1/1/1	135	S3	Диагност. Тест
	PHY413	Physics I: Mechanics. Molecular physics and thermodynamics							
	GEN111	Engineering Graphics	B	6	180	1/1/1	135	no	no
HUM100	Contemporary History of Kazakhstan	G	6	180	1/0/2	135	S6	no	
AAP106	Physical education I	G	4	60	0/0/2	30			
Total:				38	1080	38			

Year of study	Code	Name of discipline	Cycle	Total Credits	Total hours	lec/lab/pr	IWS (including IWS1), in hours	Code	pre-requisites
2 semester (spring 2020)									
1	LNG 1052	Elementary English (A1)	G	6	180	0/0/3	135	S4	LNG 1051
	LNG 1053	General English 1 (A2)							
	LNG 1054	General English 2 (A2)							
	LNG 1055	Academic English (B1)							
	LNG1056	Business English (B2)	G	4	120	0/0/2	90	S1	LNG1012.1
	LNG1057	Professional English (B2+)							
	LNG102.1	Academic Kazakh (Russian) language (B1)							
	LNG102.2	Business Kazakh (Russian) language (B2)							
	1106	ELECTIVE							
	MAT101	Mathematics I	B	6	180	1/0/2	135	HET	MAT100
	MAT102	Mathematics II							
	PHY413	Physics I: Mechanics. Molecular physics and thermodynamics	B	6	180	1/1/1	135	HET	PHY110
	PHY414	Physics II: Electricity and magnetism							
	MAT124	Linear Algebra and Analytic Geometry	B	6	180	1/0/2	135		
CHE495	Chemistry	B	6	180	2/1/0	135		HET	
AAP118	Physical education II	G	4	60	0/0/2	30			
Total:				38	1080	38			

Year of study	Code	Name of discipline	Cycle	Total Credits	Total hours	lec/lab/pr	IWS (including IWS1), in hours	Code	pre-requisites	
3 semester (fall 2020)										
2	LNG 1053	General English 1 (A2)	G	6	180	0/0/3	135	no	LNG 1052	
	LNG 1054	General English 2 (A2)								
	LNG 1055	Academic English (B1)								
	LNG1056	Business English (B2)								
	LNG 1057	Professional English (B2+)								
	MAT102	Mathematics I	B	6	180	1/0/2	135	no	MAT101	
	CHE199	Physical Chemistry								
	CSE174	Information and communication technologies (Eng)	G	6	180	2/1/0	135	S5	no	
	PHY414	Physics II: Electricity and magnetism	B	6	180	1/1/1	135	HET	PHY413	
	PHY415	Physics III: Optics. Atomic physics								
	MAT103	Mathematics III	B	6	180	1/0/2	135	no	MAT101, MAT102	
	MAT105	Ordinary Differentiation Equations MatLab	B	6	180	1/0/2	135	no	MAT101, MAT102	
	Total:				30	1050				

Year of study	Code	Name of discipline	Cycle	Total Credits	Total hours	lec/lab/pr	IWS (including IWS1), in hours	Code	pre-requisites	
4 semester (spring 2021)										
2	LNG 1054	General English 2 (A2)	G	6	180	0/0/3	135	HET	LNG 1053	
	LNG 1055	Academic English (B1)								
	LNG1056	Business English (B2)								
	LNG 1057	Professional English (B2+)								
	2109	ELECTIVE(B2+)								
	MAT127	Partial Differentiation Equations MatLab	B	6	180	1/0/2	135		MAT105, MAT102	
	GEN154	Numerical Methods and Programming	B	6	180	1/1/1	135		MAT105, CSE174	
	HUM124	Philosophy	G	6	180	1/0/2	135	S6	no	
	PHY415	Physics III: Optics. Atomic physics	B	6	180	1/1/1	135	HET	PHY414	
	PHY421	Физика материалов								
	GEN171	Statistic and Kinematics	B	6	180	1/0/2	135	S5	MAT101, MAT102, PHY413	
	Total:				36	900	36			

Year of study	Code	Name of discipline	Cycle	Total Credits	Total hours	lec/lab/pr	IWS (including IWS1), in hours	Code	pre-requisites
5 semester (fall 2021)									
3	GEN198	Dynamics	B	5	150	1/0/2	105	no	MAT105, PHY413, GEN153
	GEN410	Strength of Materials	S	5	150	1/1/1	105	no	GEN171
	GEN199	Engineering Thermodynamics	B	5	150	1/0/2	105		
	ROB529	Intro to Electronic Measuring Systems	B	5	150	1/1/1	105	P1-3	PHY414
	GEN404	Fluid Mechanics	B	5	150	2/1/0	105		GEN198
	GEN185	Statistical mechanics	B	5	150	1/1/1	105		MAT103
	GEN178	Computational Mechanics	B	5	150	1/1/1	105		GEN154
Total:				30	1050				

Year of study	Code	Name of discipline	Cycle	Total Credits	Total hours	lec/lab/pr	IWS (including IWS1), in hours	Code	pre-requisites	
6 semester (spring 2022)										
3	GEN405	Solid Mechanics	B	5	150	1/0/2	105		MCH445	
	GEN402	Engineering Materials	S	5	150	1/1/1	105	no	MCH445	
	GEN413	Theory and Design of Mechanism and Machines	B	5	150	1/1/1	105	no	GEN115, GEN171	
	GEN419	Machine Element Design	S	5	150	1/1/1	105	no	GEN115, GEN171	
	GEN420	Mechanical Systems Design	B	5	150	1/1/1	105		GEN173	
	GEN415	Numerical methods for solving engineering problems	S	5	150	1/0/2	105		MAT103	
	GEN188	Computational hydromechanics								
	HUM126	Social & Political Knowledge	G	8	240	4/0/0	180	S6		
	Total:				38	1250				

Year of study	Code	Name of discipline	Cycle	Total Credits	Total hours	lec/lab/pr	IWS (including IWS1), in hours	Code	pre-requisites
7 semester (fall 2022)									
4	GEN186	Fundamentals of mechatronics	B	5	150	1/1/1	105	no	GEN171
	GEN418	Heat Transfer	S	5	150	1/0/2	105	no	
	GEN421	Intro to Robots	S	5	150	1/1/1	105	no	EN115, GEN171
	GEN191	Design of thermal and ventilation systems	S	5	150	1/2/0	105	no	MCH445
	GEN192	Renewable Energy Systems							
	GEN159	Dynamics of Machines and Computer Analysis	S	5	150	2/1/0	105		GEN115
	GEN189	Control of Dynamic Systems							
Total:				25	750				

Year of study	Code	Name of discipline	Cycle	Total Credits	Total hours	lec/lab/pr	IWS (including IWS1), in hours	Code	pre-requisites
8 semester (spring 2023)									
4	GEN193	3D Printing of Machine Elements	S	5	150	2/1/0	135	no	
	GEN194	Biofluid Mechanics	S	5	150	2/1/0	135	no	
	GEN422	Laboratory: Fluid Flows	S	4	60	0/2/0	30	no	
	GEN423	Laboratory: Heat Transfer							
	ECA003	Preparation and writing of the thesis (project)	FA	6					
	ECA103	Graduate thesis (project) defense	FA	6					
Total:				21	210	6			

Year of study	Code	Name of discipline	Cycle	Credits	Semester
Mandatory types of training with a P/NP rating					
1	AAP101	Internship	B	2	2
2	AAP109	Industrial internship I	S	2	4
3-4	AAP181	Industrial internship II	S	4	6
Additional types of training					
1	AAP107	Sports club sectional	G	0	5-7
2-3	AAP500	Military training	B	0	3-6

Total number of credits			
Cycle of disciplines	mandatory	additional	Total
Cycle of basic disciplines (B)	135	2	137
Cycle of special disciplines (S)	49	6	55
Total of theoretical study:			250
Final attestation (FA)	12	0	12
TOTAL:			262

Decision of the Academic Council of KazNRTU named after K. Satbayev. Minutes # 3, dated 25.06.2021.
Decision of the Academic Council of the School of Energy and Mechanical Engineering. Minutes # 13, dated 07.06.2021.

Vice-Rector for Academic Affairs
Director of the Institute of Energy and Mechanical Engineering
Head of department "Mechanical Engineering and modelling"
Representative of Specialty council

B.A. Zhautikov
K.K. Yelemessov
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