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

SATBAYEV UNIVERSITY

APPROVE
Chairman of the Management Board-
Rector of Kaznitu named after K.Satpayev
M.M. Begentaev
«____» _____ 2021 г.

MODULAR EDUCATIONAL PROGRAM for recruitment to 2021-2022 academic year
Educational program 6B07109 - "Engineering Physics and Materials Science", 6B07207 - "Engineering Physics and Materials Science"
Group of educational programs B061 - "Materials Science and Technology", B069 - "Production of materials (glass, paper, plastic, wood)"

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

Year of study	Discipline code	Name of disciplines	semester	Cycle	Credits	Total hours	classroom volume of lek/lab/pr	SRS (including SRSP) in hours	Form of control	Competencies
		Language Training module								
		Required component								
1	LNG108	English language	1	O	5	150	0/0/3	105	E	
1	LNG108	English language	2	O	5	150	0/0/3	105	E	
1	LNG104	Kazakh (Russian) language	1	O	5	150	0/0/3	105	E	
1	LNG104	Kazakh (Russian) language	2	O	5	150	0/0/3	105	E	
		Module of social disciplines								
		Required component								
1	KFK101	Physical Culture I	1	O	2	60	0/0/2	30	E	
1	KFK102	Physical Culture II	2	O	2	60	0/0/2	30	E	
2	KFK103	Physical Culture III	3	O	2	60	0/0/2	30	E	
2	KFK104	Physical Culture IV	4	O	2	60	0/0/2	30	E	
1	HUM100	Modern History of Kazakhstan (state exam)	1	O	5	150	1/0/2	105	E	
2	HUM132	Philosophy	4	O	5	150	1/0/2	105	E	
2	CHE452	Ecology sustainable development	3	O	2	60	1/0/0	45	E	
2	CHE451	Life safety	4	O	2	60	1/0/0	45	E	
2	MNG487	Fundamentals of Entrepreneurship, leadership and anti-corruption culture	4	O	3	90	1/0/1	60	E	
		Socio-political knowledge module								
		Required component								
1	HUM129	Cultural studies	2	O	2	60	1/0/0	45	E	
2	HUM122	Psychology	4	O	2	60	1/0/0	45	E	
2	HUM127	Sociology	3	O	2	60	1/0/0	45	E	
1	HUM128	Political Science	1	O	2	60	1/0/0	45	E	
		Module of physical and mathematical training, computer science and chemistry								
		University component								
1	MAT101	Mathematics I	1	Б	5	150	1/0/2	105	E	
1	PHY111	Physics I. Mechanics. Molecular Physics and Termodynamics	1	Б	5	150	1/1/1	105	E	
1	MAT102	Mathematics II	2	Б	5	150	1/0/2	105	E	
1	PHY112	Physics II. Electricity and Magnetism	2	Б	5	150	1/1/1	105	E	
2	MAT103	Mathematics III	3	Б	5	150	1/0/2	105	E	
1	CHE495	General chemistry	2	Б	5	150	1/1/1	105	E	
2	CSE677	Information and communication technologies	3	O	5	150	2/1/0	105	E	
		Module of basic general technical training								
		University component								
1	GEN177	Engineering and computer graphics	1	Б	5	150	1/0/2	105	E	
1	PHY470	Physics of Matter. (Introduction to the Specialty)	2	Б	5	150	1/1/1	105	E	
2	PHY475	Physics III: Optics. Quantum physics. Atomic physics.	3	Б	5	150	1/1/1	105	E	
2	PHY476	Mechanics of Materials	3	Б	5	150	1/0/2	105	E	
2	PHY477	Quantum Mechanics	3	Б	5	150	2/0/1	105	E	
2	PHY478	Statistical physics and thermodynamics	4	Б	5	150	2/0/1	105	E	
2	PHY479	Methods of theoretical physics	4	Б	5	150	1/0/2	105	E	
2	GEN408	Strength of materials	4	Б	5	150	1/1/1	105	E	
		Professional activity module								
		University component								
3	PHY480	Technologies for obtaining nanomaterials and nanosites	5	Б	5	150	1/1/1	105	E	
3	PHY481	Condensed Matter Physics	5	Б	5	150	1/1/1	105	E	
3	PHY482	Functional Materials	5	П	5	150	1/0/2	105	E	
3	PHY483	Computational Physics	5	П	5	150	1/0/2	105	E	
3	PHY484	Modern Materials Research Methods	5	П	5	150	1/1/1	105	E	
3	PHY485	Basics of heat treatment and surface hardening	6	П	5	150	1/1/1	105	E	
3	PHY486	Non-metallic materials and technologies	6	П	5	150	1/1/1	105	E	
3	PHY487	Physics of semiconductor devices	6	П	5	150	1/1/1	105	E	
		Component of choice								
3	PHY498	Engineering Physics I	5	Б	5	150	0/0/3	105	E	
	PHY493	Technical Physics I					0/0/3			
	PHY494	Space physics					2/0/1			
	PHY495	Physics of strength and plasticity					1/1/1			
3	PHY496	Corrosion and anti-corrosion treatment	6	Б	5	150	2/0/1/	105	E	
	PHY497	Electronic Material Technology					1/1/1			

3	PHY492	Engineering Physics II	6	Б	5	150	0/0/3	105	E	
	PHY499	Technical Physics II					0/0/3			
	PHY500	Fundamentals of space technology					2/0/1			
	PHY501	Defects of the crystal structure of materials					1/1/1			
3	PHY502	Structural analysis and quality control methods	6	Б	5	150	1/1/1	105	E	
	PHY503	Methods for the formation of surface nanostructures					1/0/2			
	PHY504	Methods for deep cleaning of substances					2/0/1			
	PHY505	Methods for obtaining and researching nanostructured materials					2/0/1			
4	PHY506	Alternative technologies	7	П	5	150	1/1/1	105	E	
	PHY507	Basics of technological processes for the production of materials					1/1/1			
4	PHY508	Nuclear physics and particle physics	7	Б	5	150	2/0/1	105	E	
	PHY509	Physical foundations of microelectronics					2/1/0			
	PHY510	Physics and Optics of Photovoltaic Materials					1/1/1			
	PHY511	Computer simulation in materials science (thermocalc)					1/1/1			
4	PHY512	Nuclear technology	7	Б	5	150	2/0/1	105	E	
	PHY513	Applied Electronics					1/1/1			
	PHY514	Physics of Dielectric Materials					2/0/1			
	PHY515	Technological processes for the production of photovoltaic materials					1/1/1			
	PHY516	Reactor materials science					2/0/1			
4	PHY517	Physics and technology of particle accelerators	7	П	5	150	2/0/1	105	E	
	PHY518	Physical kinetics					2/0/1			
	PHY519	Vacuum technology and technology					1/1/1			
	PHY520	Physicochemical basics of coating					1/1/1			
	PHY521	Surface Engineering					1/1/1			
4	PHY528	Probe methods of materials research	7	П	5	150	1/1/1	105	E	
	PHY522	Methods for measuring the properties of electronic materials								
	PHY523	Micro and nanosystem design								
	PHY524	Electron microscopy and radiography								
4	PHY525	Methods for measuring parameters of electronic equipment	7	П	5	150	1/1/1	105	E	
	PHY526	Research methods for powder and composite materials								
	PHY527	Methods for obtaining powder materials								
4	PHY431	Advanced materials	8	П	5	150	1/1/1	105	E	
	PHY480	Technologies for obtaining nanomaterials and nanosystems								
	Practice-oriented module									
	Required component									
1	AAP101	Educational practice	2	Б	2					
2	AAP109	Production practice I	4	П	2					
3	AAP114	Production practice II	6	П	3					
	Module of final certification									
	Required component									
4	ECA003	Preparation and writing of a thesis (project)*	8	FC	6					
4	ECA103	Defense of the thesis (project)*	8	FC	6					
	Module of additional types of training									
	Component of choice									
	AAP107	Sports club sectional	5-7	O	0					
	AAP500	Military affairs	3-6	Б	0					

Number of credits for the entire period of study			
Cycles of disciplines	**Credits**		
	mandatory	**elective**	**Total**
Cycle of general education disciplines	58	0	58
Cycle of basic disciplines	82	30	112
Cycle of profile disciplines	35	25	60
Total for theoretical training:	**175**	**55**	***230***
Final certification	12		**12**
total:	**187**		**242**

The decision of the Academic Council of Kazntu named after K.Satpayev. Protocol № 3 **"** 25 **"** 06 **2021 г.**

Decision of the Academic Council of the MnM Institute. Protocol № 10 **"** 10 **"** 06 **2021 г.**

Vice-Rector for Academic Affairs **Zhautikov B.A.**

Director of the MnM Institute **Rysbekov K.B.**

Head of the MNnEP Department **Kakimov U.K**

Representative of the Specialty Council from employers **Serikkanov A.S.**