

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

APPROVED
Director of the Mining and Metallurgical
Institute

_____ K.B. Rysbekov
« _ » _____ 2021 y.

ELECTIVE subjects for recruitment to the 2021-2022 academic year
Educational program 6B07203 - "Metallurgy and mineral processing"
Group of Educational programs B071 - "Mining and extraction of minerals"

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

Year of study	Elective code	Code of discipline	Name of discipline	Cycle	Credits	lec/lab/pr/si w	Prerequisites	
5th semester (AUTUMN 2023)								
3	3302	MET513	Theory and technology of steelmaking processes	S	5	2/0/1/2	MET619	
		MET515	Theory and technology of preparation of technogenic and secondary raw materials of ferrous and non-ferrous metallurgy for metallurgical processing			2/1/0/2	MET429	
		MET623	Powder metallurgy			2/0/1/2	CHE199	
		MET624	Experimental Foundations in Metallurgy			2/1/0/2	CHE192	
		MET516	Magnetic and special enrichment methods			1/1/1/2	MET163	
		MET517	Flotation reagents in mineral processing			2/1/0/2	CHE192	
	3303	MET518	Special electrometallurgy	S	5	2/0/1/2	MET619	
		MET520	Recycling of fine industrial waste			2/0/1/2	MET429	
		MET625	Corrosion and protection of metals			2/1/0/2	MET619	
		MET626	Technology of composite materials			2/0/1/2	CHE199	
		MET521	Processes and devices of processing production			2/1/0/2	MET163	
		MET522	Auxiliary economy in mineral processing			2/0/1/2	MET163	
	6th semester (SPRING 2024)							
	3	3304	MET553	Basics of scientific research in metallurgy	S	5	2/0/1/2	MET412
MET554			Processes of processing of technogenic waste	2/0/1/2			MET412	
MET555			Receive, the quality and certification of by-products in the process of recycling	2/0/1/2			MET619	
MET590			Consumer properties of metallurgical products	2/0/1/2			MET619	
MET591			Geotechnology in metallurgy	2/0/1/2			MET412	
MET571			Special and combined methods of dressing	1/1/1/2			MET180	
MET572			Fundamentals of scientific research in ore dressing	2/1/0/2			MET180	
3305		MET523	Processes and devices in the ferrous metallurgy	S	5	2/0/1/2	MET412	
		MET524	Processes and devices in non-ferrous metallurgy			2/0/1/2	MET412	
		MET578	Metallurgical furnaces			2/0/1/2	MET430	
		MET579	Types of coatings on metals and their production processes			2/0/1/2	MET619	
		MET526	Enrichment of gold-bearing and uranium ores			2/1/0/2	MET153	
		MET527	Modeling of enrichment processes			1/1/1/2	MET163	
3306		MET528	Alloys of non-ferrous and ferrous metals	S	5	2/0/1/2	MET412	
		MET529	Metallurgy of lead and zinc			2/1/0/2	MET429	
		MET580	Heat and mass transfer of metallurgical processes			2/0/1/2	MET430	
		MET581	Processes and devices of powder metallurgy			2/0/1/2	MET430	
		MET531	Enrichment of polymetallic ores			1/1/1/2	MET175	
MET532	Enrichment of rare metal ores	2/1/0/2	MET175					
Total:					25	25		
7th semester (AUTUMN 2024)								
4	4307	MET558	Modeling of metallurgical processes	S	5	2/0/1/2	MET412	
		MET573	Design of metallurgical units in ferrous metallurgy			2/0/1/2	MET412	
		MET592	Processing of uranium and rare metal raw materials of Kazakhstan			2/0/1/2	MET430	
		MET617	Theory and practice of metal refining			2/1/0/2	MET117	
		MET560	Assay and control of concentrating processes			1/1/1/2	MET180	
		MET574	Ore beneficiation research			2/1/0/2	MET180	
	4308	MET575	Fundamentals of metallurgical production design	S	5	2/0/1/2	MET412	
		MET563	Dust collection and gas cleaning in non-ferrous metallurgy			2/0/1/2	MET412	
		MET594	Technology of refractory and heat-insulating materials			2/0/1/2	MET412	
		MET618	Modern ecological schemes and forecasting in metallurgy			2/0/1/2	MET619	
		MET564	Design of concentrating factory			2/1/0/2	MET180	
		MET576	Digitalization of mining and processing and metallurgical plants			2/1/0/2	MET180	
	8th semester (SPRING 2025)							
	4	4309	MET533	Metallurgy of ferroalloys	S	5	2/0/1/2	MET412
MET534			Metallurgy of copper and nickel	2/1/0/2			MET429	
MET582			Advanced metallurgy and product design	2/0/1/2			MET619	
MET583			Metallurgical systems research	2/1/0/2			MET619	
MET536			Enrichment of mining and chemical and non-metallic raw materials	2/1/0/2			MET163	
MET537			Concentration of ferrous metals ores	1/1/1/2			MET163	
MET538			Foundry production of metals and alloys	2/0/1/2			MET412	

4310	METS39	Metallurgy of radioactive and related metals	S	5	2/0/1/2	MET412
	METS84	Production of special alloys			2/0/1/2	MET412
	METS85	Technology of firing and melting processes			2/0/1/2	MET430
	METS41	Enrichment of ores of ferrous metals			1/1/1/2	MET180
	METS42	Geotechnological methods of enriching			1/1/1/2	MET153
	Total:					20

Number of credits on elective subjects for the entire period of study	
Cycles of disciplines	Credits
Cycle of General subjects (G)	0
Cycle of basic disciplines (B)	0
Cycle of profiling disciplines (P)	45
Overall:	45

Decision of the Scientific Council of the Mining and Metallurgical Institute named after O. A. Baikonurov.
__, dated "__" _____ 20__.

Minutes

Head of department "Metallurgy and mineral processing"

M.B. Barmenshinova

Head of department "Metallurgical processes, heat engineering and technology of

T.A. Chepushtanova

Partner university:

Worcester Polytechnic Institute (USA)

B. Mishra

Representative of Specialty council of the LLP "Kazakhmys"

E.A. Ospanov

Representative of Specialty council of the LLP "KAZ Minerals"

U.K. Jetybaeva