**AGREED** 

**Deputy Chief** 

«Almaty power supply distance»

branch of NC KTZ JSC -

«Almaty branch of the backbone network»

Orymbaev B.I.

« DA 50 03 20 25

"Automation and telecommunications"

Toygozhinova A.Zh.

"144"

"2013

## CATALOG OF ELECTIVE DISCIPLINES

**EDUCATIONAL PROGRAMS** 

7M07149 - Electrical power engineering

**Education level:** 

master's degree

Duration of study: 1,5 years

Year of admission: 2023 y.

|  | Cycle | Compo | Name of the discipline                | Overall labor intensity in in |                   | Seme | Lagraina            |  |                              |                                 |
|--|-------|-------|---------------------------------------|-------------------------------|-------------------|------|---------------------|--|------------------------------|---------------------------------|
| Module                                 |       |       |                                       | academic<br>hours             | academic<br>Ioans | ster | Learning<br>outcome | Brief description of the discipline  | Prerequisites                | Postrequisites                  |
| 1                                      | 2     | 3     | 4                                     | 5                             | 6                 | 7    | 8                   | 9  | 10                           | 11                              |
| Module 3 –<br>Research<br>Competencies | BD    | EC    | SMART<br>technologies in<br>transport | 270                           | 9                 | 1    | LO 1, 4             | Pассматриваются и изучаются The intellectual technologies used in railway transport are considered and studied. The basic concepts of the current state and prospects for the development of railway transport infrastructure based on SMART technologies are described. Familiarization of students and the formation of skills for assessing the improvement of operational safety of railway infrastructure facilities, taking into account the development of computer technologies, software and artificial intelligence. Active teaching methods and brainstorming are used. | Undergraduate<br>disciplines | ERWM,<br>Industrial<br>practice |

|  |    |       | Lean<br>manufacturing   |     |   |   | LO 4 | The discipline studies the basics of organization management based on the principles of lean production: minimizing all types of losses in the course of activity, achieving the maximum possible result in the shortest possible period of time, rational use of all types of resources, improving aspects of the organization's activities, involving employees in technological processes; formation of lean thinking among future managers, correlated with relevant ideas for the modern world concepts of sustainable development and conscious consumption.  | Undergraduate<br>disciplines | ERWM,<br>Industrial<br>practice |
|--|----|-------|---|-----|---|---|------|---|------------------------------|---------------------------------|
| Module 5 –<br>Professional<br>Competencies | PD | PD EC | Rational<br>resource<br>conservation  | 270 | 9 | 1 | LO 2 | The methods of resource-saving management at industrial enterprises are analyzed depending on the factors and the sphere of use of material resources. The objectives of enterprises in the field of resource conservation are studied by determining the correlation between the sources and causes of losses of material resources at industrial enterprises, rational use of natural resources and resource conservation, international experience in the field of environmental protection and sustainable use of natural resources to ensure economic and energy security, focused on planning and forecasting promising areas of development in the field of ecology and rational use of natural resources. | Bachelor's<br>majors.        | Final<br>assessment             |
|  |    |       | Energy-saving technologies and energy inspection in the electric power industry |     |   |   | LO 7 | When studying the discipline, questions are considered on the principles, methods and technical means of rational use of electricity and reducing energy losses in the power supply system of an industrial enterprise, providing consumers with electric energy with standardized quality, reliability and efficiency. Within the framework of the discipline, guest lectures are provided by top managers and specialists of scientific and design institutes. Teaching methods - case-study, group   | Bachelor's<br>majors.        | Final<br>assessment             |

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|  |    |       |   |       |   |   |      | discussions.  |                       |  |
|--|----|-------|---|-------|---|---|------|---|-----------------------|--|
| Module 5 –<br>Professional<br>Competencies | PD | EC    | Ways to improve the quality of electricity                      | 180   | 6 | 1 | LO 3 | Studies methods and technical means of rational use of electricity and reduction of energy losses in the power supply system of an industrial enterprise, providing consumers with electric energy with standardized quality, reliability and efficiency. Formation of stable knowledge of undergraduates on problematic issues of power supply systems of various industries. The discipline uses interactive teaching methods, case methods, group work. Within the framework of the discipline, guest lectures are provided by top managers of JSC NC KTZ. | Bachelor's<br>majors  | Mutual<br>electromagnet<br>influence in<br>electrical<br>equipment           |
|  |    |       | Ways to improve reliability                                     |       |   |   | LO 3 | Studies the main methods of calculating the reliability of power supply systems, analyzing the reliability of individual power supply systems, the main ways to improve the operational reliability of energy systems, providing consumers with electric energy with standardized quality, reliability and efficiency. Active teaching methods: teamwork, discussions. Within the framework of the discipline, guest lectures are provided by top managers of JSC NC KTZ.   | Bachelor's<br>majors. | Mutual<br>electromagnetic<br>influence in the<br>electric power<br>industry  |
|  | PD | PD EC | Mutual electromagnetic influence in electrical equipment        | 180 6 | 6 | 2 | LO 6 | The issues of a complex of concepts, concepts and requirements for electromagnetic compatibility of electrical and power equipment in transport and industrial enterprises are considered. Active teaching methods used in the discipline are an individual task. Within the framework of the discipline, guest lectures are provided by stakeholders of scientific and design institutes, top managers of JSC NC KTZ.  | Bachelor's<br>majors. | Scientific and<br>technical<br>problems of the<br>electric power<br>industry |
|  |    |       | Mutual electromagnetic influence in the electric power industry |       |   |   | LO 6 | The issues of electromagnetic compatibility of electrical equipment in power supply systems in transport, industrial and other facilities are considered. The discipline uses active teaching methods: teamwork, discussions, brainstorming, express survey. Within the framework of the  | Bachelor's<br>majors. | Scientific and<br>technical<br>problems of the<br>electric power<br>industry |

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|                               | TOTAL | Electrical<br>installations in<br>technological<br>processes                         | 1080 | 36 |   | LO 6 | processes with an automated electric drive and the determination of parameters under various modes of its operation are considered. The task of the discipline is to study the interaction of elements in the technological processes of systems. Teaching methods: teamwork, discussions, individual tasks. Within the framework of the discipline, guest lectures are provided by top managers of energy companies.   | Bachelor's<br>majors. | Industrial<br>practice, Final<br>assessment |
|-------------------------------|-------|--|------|----|---|------|---|-----------------------|---|
| Competencies                  |       |  |      |    |   |      | When studying the discipline, the issues of the use of electrical installations in technological  |                       |   |
| Module 5 –<br>Professional PD | D EC  | Electrotechnical<br>complexes and<br>electric drive of<br>technological<br>processes | 180  | 6  | 2 | LO 6 | discipline, guest lectures are provided by top managers of JSC NC KTZ.  Studies the general physical laws of the electric drive, the features of the interaction of the elements of the electromechanical system, the nature of dynamic processes and the features of static modes. Acquires knowledge on the properties and characteristics of automated electric drive systems, methods of calculating parameters, static and dynamic characteristics and selection of elements. Active teaching methods: group work, discussions. Within the framework of the discipline, guest lectures are provided by top managers of energy companies. | Bachelor's<br>majors. | Industrial<br>practice, Final<br>assessment |

Head of the Department «Energy»

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