

Head of ShCh-33, "Almaty Signaling and Communications Distance" of the Almaty Main Line Department of NC "KTZ" JSC

Kuanshbaev M.N.



## THE CATALOG OF DISCIPLINES OF THE COMPONENT OF CHOICE

### EDUCATIONAL PROGRAM

8D07167 – Automation and control

Education level: doctoral studies

Duration of study: 3 years

Year of admission: 2025

| Cycle | Component | Name of the discipline                                                              | Total labor intensity |                     | Term | Educational outcomes | Brief description of the discipline                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Prerequisites                              | Post-requirements                                              |
|-------|-----------|-------------------------------------------------------------------------------------|-----------------------|---------------------|------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------|
|       |           |                                                                                     | in academic hours     | in academic credits |      |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                            |                                                                |
| BD    | CC        | Methods and means of increasing the reliability of electrical complexes and systems | 150                   | 5                   | 1    | PO4                  | The discipline studies the basic reliability indicators of existing and prospective microelectronic complexes and systems, the analysis of reliability and safety of two- and three-channel structures, the regulation and proof of safety of various complexes and systems, the types of tests of safe systems on machine models, the reliability of devices and equipment of electrical automation and telemechanics systems, and the modeling of the reliability of electrical complexes and systems.            | Bachelor's and Master's degree disciplines | Doctoral Research Work, Final Certification, Research Practice |
|       |           | Methods and means of efficient operation of electrical complexes and systems        |                       |                     |      | PO4                  | The discipline studies the performance indicators of microprocessor complexes, the calculation of performance indicators for systems with complex structures, methods of standardization and conditional indicators, the intensity of failures, and internal and external factors affecting the performance reliability of complexes and systems.                                                                                                                                                                   | Bachelor's and Master's degree disciplines | Doctoral Research Work, Final Certification, Research Practice |
| PD    | CC        | Identification of automatic control systems                                         | 150                   | 5                   | 1    | PO5                  | The discipline provides general equations for control objects; identification of static and dynamic characteristics of industrial objects; methods for constructing models of control objects; an engineering method for determining a refined model of a process control system using regulators; selection of a regulator and its settings in an automatic stabilization system based on simplified dynamic characteristics of the object; and identification of the main elements of industrial electric drives. | Bachelor's and Master's degree disciplines | Doctoral Research Work, Final Certification, Research Practice |

|        |  |                                               |     |    |  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |                                                                |
|--------|--|-----------------------------------------------|-----|----|--|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------|
|        |  | Theory and technique of scientific experiment |     |    |  | PO6 | The discipline studies the basics of system analysis, models of complex systems, the principles and structure of system analysis, the basics of evaluating complex systems, methods of qualitative and quantitative evaluation of systems, the basics of management, models of the main functions of organizational and technical management, the quality of management, mathematical tools in project management taking into account risks, and forecasting the implementation of an investment project using logistic curves. | Bachelor's and Master's degree disciplines | Doctoral Research Work, Final Certification, Research Practice |
| Total: |  |                                               | 300 | 10 |  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                            |                                                                |

Head of the Department of "AC"



Suleimenova G.A.