**Deputy Director General IICT**
**KN of the MIAR RK, professor, PhD**
**_____ Mamyrbayev O.Zh.**
**«__18__» __03__ 2025 y.**

**APPROVED**
**Director of the E&DT Institute**
**_____ A. Toygozhinova**
**«__18__» __03__ 2025 y.**

# CATALOG OF DISCIPLINES OF THE OPTIONAL COMPONENT

## EDUCATIONAL PROGRAM 7M06135 – IT SYSTEMS MANAGEMENT

**Level of Education: Specialized Master's** **Duration of Study: 1 year** **Year of Admission: 2025**

| Cycle | Component | Course Title | Total Workload | | Semester | Learning Outcomes | Course Description | Prerequisites | Postrequisites |
|---|---|---|---|---|---|---|---|---|---|
| | | | in academic hours | in academic credits | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| BD | KV | Lean Manufacturing | 120 | 4 | 1 | PO2 | Studies the fundamentals of organizational management based on lean manufacturing principles: minimizing all types of losses in processes, achieving the maximum possible results in the shortest possible time, rational use of all types of resources, improving various aspects of organizational activities, and involving employees in technological processes. It aims to develop lean thinking in future managers, aligned with contemporary concepts of sustainable development and conscious consumption. | Courses of the Bachelor's Specialized Discipline Cycle (SD) | Final Assessment |
| BD | KV | SMART Technologies in Transport | | | | PO2 | The course examines intelligent technologies for digital monitoring, automation, and management of transport infrastructure objects using modern IT solutions. It develops competencies in applying the Internet of Things, artificial intelligence, digital twins, and predictive analytics to enhance the safety, reliability, and efficiency of transport systems. Students learn methods for building SMART systems, digital modeling, and forecasting to support sustainable development in the transport sector. | Courses of the Bachelor's Specialized Discipline Cycle (SD) | Final Assessment |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PD | KV | Neural Network Technologies in Software Engineering | 150 | 5 | 1 | PO5 | This course explores the application of artificial intelligence and neural network technologies in software engineering. Students study machine learning algorithms, neural network architectures, and methods for integrating them into practical software solutions. The course also covers the fundamentals of designing intelligent systems. | Courses of the Bachelor's Specialized Discipline Cycle (SD) | Final Assessment |
| PD | KV | Big Data and Analytics in IT Systems Management | 150 | | | PO6 | The course covers modern technologies for big data processing and analysis, as well as machine learning methods. Students study data storage, distribution, and processing systems, along with tools such as Python, TensorFlow, and Spark. The course aims to teach students how to extract valuable insights from large datasets and develop intelligent decision support systems. | Courses of the Bachelor's Specialized Discipline Cycle (SD) | Final Assessment |
| PD | KV | Advanced Applications and Network Security | 150 | 5 | 1 | PO7 | The course covers the development of complex applications and ensuring their security in network environments. Students study types of network attacks, protection methods, security protocols, and encryption technologies. Special attention is given to securing web and mobile applications, as well as ensuring safe data transmission. The course also addresses modern threats and response methods, with a focus on practical application of knowledge. | Courses of the Bachelor's Specialized Discipline Cycle (SD) | Final Assessment |
| PD | KV | Cloud Computing Management | | | | PO7 | The course covers methods for planning, deploying, and managing cloud computing resources. Students study popular platforms such as AWS, Microsoft Azure, and Google Cloud. Topics include security, scalability, availability, and cost optimization. The course includes practical case studies and real-world scenarios, with the primary goal of preparing specialists for effective cloud infrastructure management. | Courses of the Bachelor's Specialized Discipline Cycle (SD) | Final Assessment |
| **Total:** | | | **420** | **14** | | | | | |

**Head of the Department "ICT"** _____ **D.T. Kasymova**