**Logistics Engineering MSc Program in English**

**Final Examination Question List**

**Final Examination Subjects:**

* 1. Final Examination Theme: Theory of Logistics Systems

1. subject: System Engineering and System Modeling (Dr. Gabriella Vadászné Bognár)

2. subject: Intelligent Material Handling Machines and Systems (Dr. Péter Telek)

3. subject: Design of Material Handling Systems and Warehouses (Dr. Tamás Bányai)

4. subject: Quality Management of Logistics Systems (Dr. Ágota Bányainé)

* 2. Final Examination Theme: Digital Logistics

1. subject: Simulation Examination of Logistics Systems (Dr. Péter Tamás)

2. subject: Industry 4.0 and Logistics (Dr. Tamás Bányai)

3. subject: Standard Solutions in Logistics Networks (Dr. János Juhász)

4. subject: Modeling and Simulation of Transport Systems (Dr. Róbert Skapinyecz)

**System Engineering and System Modeling (Dr. Gabriella Vadászné Bognár)**

1. Deterministic and stochastic systems. Give an example of analysis and synthesis. Introduce the system identification.
2. Structural hierarchy of machine configurations: element, element group, subsystem, machine and machine group.
3. Characterization of systems with impact diagrams. Give an example of the construction of an effect scheme.
4. Analysis and management of roads and networks. Give an example and explain it.
5. Modeling of a machine structure, levels of functions, function structures. Give an example and explain it.
6. Modeling of a special logistics system. Give an example and explain it.

**Intelligent Material Handling Machines and Systems (Dr. Péter Telek)**

1. Variations, operation characteristics, automation and application possibilities of floor level mobile material handling machines.
2. Variations, operation characteristics, automation and application possibilities of overhead mobile material handling machines.
3. Variations, operation characteristics, automation and application possibilities of mounted material handling machines.
4. Variations, operation characteristics, automation and application possibilities of storage-retrieval machines.
5. Variations, operation characteristics, automation and application possibilities of continuous material handling equipment.
6. Definition, structure and operation characteristics of material handling systems. Objectives, variations and application possibilities of the planning of material handling.

**Design of Material Handling Systems and Warehouses (Dr. Tamás Bányai)**

1. Layout design in logistics. Objectives, constraints and decision variables. Types of facility layouts.
2. Routing problems. Objectives, constraints and decision variables. Types of routing problems.
3. Scheduling in logistics. Objectives, constraints and decision variables. Types of scheduling problems.
4. Inventory management. Economic Order Quantity. Material Requirement Planning.
5. Loading unit. Choosing loading units.
6. Reliability in logistics. Models and methods for the analysis of materials handling systems.

**Quality Management of Logistics Systems (Dr. Ágota Bányainé)**

1. The concept of quality.
2. Logistics system performance. Logistics costs.
3. The 3 important components of customer satisfaction, the relationship between quality assurance and logistics.
4. The structure of the quality loop.
5. Purpose and functional components of CRM.
6. The concept of TQM.

**Simulation Examination of Logistics Systems (Dr. Péter Tamás)**

1. House of the Toyota Production System (TPS). The meaning and principles of the Lean philosophy. Types of activities and losses.
2. The concept of simulation, its possible objectives. Classification possibilities of simulation models.
3. Types of value stream mapping, steps of their implementation. Application of dynamic value stream mapping method.
4. Features of discrete, event-driven simulation programs. Principles of kanban system operation, its objects defined in simulation framework.
5. Types of simulation testing methods, the process of their application.
6. Possibilities of connection between lean tools and simulation examination.

**Industry 4.0 and Logistics (Dr. Tamás Bányai)**

1. The emergence of Industry 4.0 along the industrial revolutions. The main topics of industrial revolutions and their impact on materials handling and logistics.
2. IT trends in logistics: IoT, big data, cloud and fog computing, digital twin.
3. Digital factory.
4. Describe the development trends of Logistics 4.0.
5. Materials handling 4.0.
6. Gentelligent products. Lifecycle of gentelligent products. Intelligent tools.

**Standard Solutions in Logistics Networks (Dr. János Juhász)**

1. What we call a standard and what characteristics does it have. What sets a standard apart from general corporate management documentation. Describe the notation system of the standards.
2. What are the groups of standards and describe them. What are the most known and most used standards in the corporate sector!
3. Describe the GS1 standard system and what units does it contains. Give an example of field of application.
4. What are the typical GS1 and non-GS1 data structures and data elements. Group and characterize them!
5. Provide the main questions, steps, items, and tools for building a supply chain tracking network.
6. What does IoT and Blockchain mean. What the two technologies are all about. Give an example of their role in a logistics network.

**Modeling and Simulation of Transport Systems (Dr. Róbert Skapinyecz)**

1. Give the definition of transport! Define the purpose of transport and the meaning of scheduled and public transport! Provide definitions of mobility and modal split!
2. Give the most important qualitative and quantitative indicators of public transport!
3. Give the most important parameters describing the traffic flows of road traffic!
4. Determine the reasons for the use of traffic simulations and the typical application possibilities!
5. Determine the reasons for the application of network-level traffic modeling and traffic planning, as well as the typical application possibilities!
6. What does sustainability mean in transport? Describe the most important goals to be achieved for the implementation of sustainable transport systems!