1. Subject name	**Planning of plant logistics systems**				
2. Subject name in Hungarian	Üzemi logisztikai rendszerek tervezése				
3. Code	**BMEKOALM327**	4. Evaluation type	**exam grade**	5. Credits	**5**
6. Weekly contact hours	**2 (10) Lecture**	**2 (11) Practice**	**0 (0) Lab**		
7. Curriculum	**Logistics Engineering MSc (L)**	8. Role	**Mandatory (mc) at Logistics Engineering MSc (L)**		
9. Working hours for fulfilling the requirements of the subject					**150**
Contact hours	56	Preparation for seminars	12	Homework	40
Reading written materials	16	Midterm preparation	6	Exam preparation	20
10. Department	**Department of Material Handling and Logistics Systems**				
11. Responsible lecturer	Dr. Bóna Krisztián				
12. Lecturers	Dr. Bóna Krisztián, Bertalan Marcell				
13. Prerequisites	**strong: KOALM331 - Process planning** **strong: KOALM336 - Logistics planning softwares** **week: KOALM335 - Simulations planning**				

14. Description of lectures

The specific properties and planning process of intralogistics systems in case of plant facilities. The main steps and tasks of intralogistics planning. How to create a logistics system plan in case of a plant logistics system. The facility layout planning techniques and methods, the systematic facility layout planning. The applied specific facility layout topologies and the mathematical modelling approaches of the theoretical facility layout planning problems. The models of the value creating objects, modelling the single, workshop, group and line based intralogistics networks, supporting the decisions regarding to the spatial layout. Choosing the theoretical layout planning models regarding to the previous decided spatial layouts. Defining of the linear and the quadratic facility layout planning problems. The main heuristic and optimization methods and algorithms for solving the linear and quadratic facility layout planning problems. Defining the main staps of the detailed facility layout design. The material flow system architecture in a plant. The planning steps of the material flow systems in a plant. The methodology of material flow system planning, the main heuristic and optimization modells. Analitical queueing theory models and simulation methods in the planning of facility logistics systems. Specific system planning and sizing task regarding to the application of the continuous and discontinuous operated material handling machines. Integration of the basic arguments of lean philosophy in the planning process.

15. Description of practices

Practical application of the planning techniques and methods presented on the lectures through a complex facility layout planning homework, preparation of the individual facility layout planning tasks.

16. Description of labortory practices

17. Learning outcomes

A. Knowledge

- Knowledge of the planning process and specialties in the development of the intralogistics system.
- Knowledge of the main KPIs of the intralogistics system.
- Knowledge of the individual, linear, group-based, and workshop-based topologies and models.
- The student has comprehensive knowledge of the approximation and optimization methods for solving linear and quadratic layout planning tasks.
- Knowledge of the detailed plant layout planning methodologies.
- The student knows the application of the analytical queuing models that can be used in material flow system planning.
- Knowledge of the specific system planning and system sizing methods that can be used in material flow systems.
- Knowledge of the application of lean philosophy that can be used in the planning processes.

B. Skills

- Can apply the modelling approach.
- Can interpret the intralogistics network of the production objects.
- Can decide the right topology of the objects and able to select the theoretical layout planning method for this topology.
- Can apply the approximation and optimization methods of the linear and quadratic layout planning tasks.
- The student is capable of modeling material flow systems using analytical queuing theory.
- Able to use simulation systems and models in planning material flow systems.

C. Attitudes

- Student is opened to use math and information technology tools.
- Endeavor to understand and routinely use the methodology and tools required to solve the problems.

D. Autonomy and Responsibility

- Makes responsible and independent suggestions for planning problems.
- Take responsibilities for the consequences of decisions made during the planning process.
- Uses systemic approach.

18. Requirements, way to determine a grade (obtain a signature)

The requirement of the signature is to fulfill the homework and one midterm test. The homework (30%), the test (20%) and the exam result (50%) are included in the final grade.

19. Opportunity for repeat/retake and delayed completion

The midterm test, the part-performance check and the final submission can both be resubmitted once.

20. Learning materials

Students can download the subject notes in pdf format via Moodle.

Effective date	10 October 2019	**This Subject Datasheet is valid for**	Inactive courses