1. Subject name	**Simulations planning**				
2. Subject name in Hungarian	Szimulációs tervezés				
3. Code	**BMEKOALM335**	4. Evaluation type	**mid-term grade**	5. Credits	**3**
6. Weekly contact hours	**1 (4) Lecture**	**1 (5) Practice**	**1 (5) 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					**90**
Contact hours	42	Preparation for seminars	13	Homework	15
Reading written materials	8	Midterm preparation	12	Exam preparation	0
10. Department	**Department of Material Handling and Logistics Systems**				
11. Responsible lecturer	Dr. Bóna Krisztián				
12. Lecturers	Dr. Bóna Krisztián, Dr. Bohács Gábor, Bakos András				
13. Prerequisites					

14. Description of lectures

The types of modells, the basics and mathematical rudiments of modelling. Stochastic and deterministic processes, and the main process properties. The definition of computer based simulation modelling and the application in the logistics system planning. Verification and validation. Queueing theory. Simulation algorithms and programming. Simulation and optimization, simulation based optimization methods. The simulation softwares and simulators. Application of simulation based optimization methods in logistics. Application of artificial intelligence in specific logistics optimization problems. Development of simulation systems and models in intra- and extra logistics systems.

15. Description of practices

Practicing the tasks related to modeling and parameterization, described in the lectures, through individual tasks, and preparation of the homework.

16. Description of labortory practices

Practicing the use of simulation techniques, simulators and simulation systems presented in the lectures within the framework of computer labs, through examples developed in the exercises, as well as the preparation of the homework.

17. Learning outcomes

A. Knowledge
- Knowledge of modeling and simulation basics.
- Knowledge of the typical features of simulation softwares.
- Knowledge of the simulation's relationship with optimization and with artificial intelligence.

B. Skills
- Ability to model logistics systems with analytical and simulation techniques.
- Ability to evaluate logistics systems with analytical and simulation tools.
- Ability to use simulation software or apply basic programming skills to simulation tasks.
- Ability to design logistics systems with simulation.

C. Attitudes
- Strive to maximize their abilities to make their studies at the highest possible level, with a profound and independent knowledge, accurate and error-free, in compliance with the rules of the applicable tools, in collaboration with the instructors.

D. Autonomy and Responsibility
- Take responsibility for the quality of the work and the ethical standards that set an example for the classmates, using the knowledge acquired during the course.

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

The requirement of the complete the subject is to fulfill the homework and two midterm test. The homework (30%), and the tests (35-35%) are included in the final grade.

19. Opportunity for repeat/retake and delayed completion

The homework can be resubmitted once. Both tests can be retaken 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