

Course title: Theory of Material Flow Systems	Neptun code: GEALT408-a
Course coordinator: Dr. Tamás Bányai, PhD, dr. habil., professor	
type of lesson and number of lessons: lecture (2)	
method of evaluation: colloquium	
curriculum location of the subject: (autumn/spring semester): autumn and spring	
pre-study conditions (<i>if any</i>): -	
The task and purpose of the subject:	
The aim of the course is likely to provide students with an understanding of the mathematical and analytical methods used to design, analyze, and optimize material flow systems within various industrial settings.	
Course description:	
Mathematical description of material flow. Methods of analysis and evaluation of material flow systems. Facility location problems. Loading unit building. Routing problems, TSP, milkrun. Performance analysis of material flow systems. Optimization of system parameters. Planning of supermarkets and in-plant storages. roller conveyor, hanger conveyor, vertical track forklift, conveyor belt, homogeneous and inhomogeneous material handling systems. Reliability of a material handling system.	
Required literature:	
1. Kuliwicz, R. A.: Materials handling handbook, John Wiley and sons, New York, 1985.	
2. Bányai, T.: Design of Material flow systems. 2021. ISBN 978-963-358-237-4	
Recommended literature:	
1. Langford, J.: Logistics principles and applications, Sole Press, ISBN-10: 0-07-147224-X, 2007.	