

Course title: Engineering application of experimental design methods	Neptun code: GEGTT413-a
Course coordinator: Dr. Gyula Varga, associate professor	
type of lesson: 2 lectures weekly	
method of accountability: colloquium	
curriculum location of the subject: Spring	
pre-study conditions: -	
The task and purpose of the subject:	
The purpose of experimental design is to separate the significantly influencing factors from the less important ones. Determining the optimal setting value of important parameters. The different chapters of the subject also keep this in mind.	
Course description:	
Place of experiment in the research process. Statistical experiment design options. Steps of the experimental methodology: Preparation; Planning; Implementation; Analysis; Verification. The importance of modelling in research. Possibility to check the usability of the model. Problem formulation, problem analysis. The role and importance of experimental design. The process of implementing a full factorial experimental design. Levels and classification of factors. Main effects and interactions. Presentation of the main features of the partial factorial experimental design and the main steps of implementing the gradient optimization method named after Box-Wilson. Linear and quadratic factorial experimental designs	
Required literature:	
<ol style="list-style-type: none"> 1. Peter Woolf et al.: Chemical Process Dynamics and Controls, Chapter 14: Design of Experiments, The LibreTexts, 2023 2. Shina, S.: Three-Level Factorial Design and Analysis Techniques. In: Industrial Design of Experiments. Springer, Cham. (2022). 3. Paul D. Berger, Robert E. Maurer, Giovana B. Celli: Experimental Design, With Application in Management, Engineering, and the Sciences, Springer International Publishing AG 2018 4. Philip Cash, Tino Stanković, Mario Štorga: Experimental Design Research, Approaches, Perspectives, Applications, Springer International Publishing Switzerland 2016, 5. Taguchi, G.: System of Experimental Design, (Volume I and II), UNIPUB, Kraus International Publications, White Plains, New York, 1987 	
Recommended literature:	
<ol style="list-style-type: none"> 1. Angela Dean, Daniel Voss, Danel Draguljic: Design and Analysis of Experiments, Springer; 2nd Edition, 2017 2. Lauro, C.H., Pereira, R.B.D., Brandão, L.C., Davim, J.P.: Design of Experiments—Statistical and Artificial Intelligence Analysis for the Improvement of Machining Processes: A Review. In: Davim, J. (eds) Design of Experiments in Production Engineering. Management and Industrial Engineering. Springer, Cham. (2016). 3. Jiju Antony: Design of Experiments for Engineers and Scientists, Second edition, Elsevier, 2014 4. Krishnaiah K, Shahabudeen: Applied Design of Experiments and Taguchi Methods, PHI Learning Private Limited, New Delhi-110001, 2012 5. Fisher, R. A.: The Design of Experiments, 8th edition, Hafner Publishing Company, New York, 1966 	