

School of Engineering and Natural Sciences / Industrial Engineering (English)

2023 - 2024 Academic Year

DESIGN of EXPERIMENT

Syllabus

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
DESIGN of EXPERIMENT	IND4210796	Spring Semester	3+0	3	6
Prerequisites Courses	OLASILIK VE RASSAL DEĞİŞKENLER				
Recommended Elective Courses					
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Elective				
Course Coordinator	Assoc.Prof. Melis Almula KARADAYI				
Name of Lecturer(s)	Assoc.Prof. Melis Almula KARADAYI				
Assistant(s)					
Aim	This course aims to teach the basic principles and methods of statistical experimental design.				
Course Content	This course contains; Review of Basic Statistical Concepts,Introduction to Design of Experiments,Comparing Multiple Means. Analysis of Variance (ANOVA),Single Factor Experiments & One-Way Analysis of Variance,One-Way Analysis of Variance. Simultaneous Confidence Intervals. Parameter Estimation.,Expected Mean Square (EMS) & Power Calculations,Special Case of Two Averages,Random Effects Model,Randomized Block Designs,Multifactor Designs,Two-Factor Experiments I,Two-Factor Experiments II,Mixed Effect Models,2k Multifactor Designs.				
Course Learning Outcomes		Teaching Methods	Assessment Methods		
5.Use statistical package SPSS.		13, 14, 9	F		
4.Evaluate random effects and mixed effects		12, 13, 9	A		
3.Analyze the results of the experiment with Analysis of Variance (Anova)		12, 13, 9	A		
1. Collect, analyze, interpret and present data		13, 14, 16, 9	A		
2. Design Engineering Experiments		13, 16, 9	A		
Teaching Methods	12: Problem Solving Method, 13: Case Study Method, 14: Self Study Method, 16: Question - Answer Technique, 9: Lecture Method				
Assessment Methods	A: Traditional Written Exam, F: Project Task				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	Review of Basic Statistical Concepts				
2	Introduction to Design of Experiments				
3	Comparing Multiple Means. Analysis of Variance (ANOVA)				
4	Single Factor Experiments & One-Way Analysis of Variance				
5	One-Way Analysis of Variance. Simultaneous Confidence Intervals. Parameter Estimation.				
6	Expected Mean Square (EMS) & Power Calculations				
7	Special Case of Two Averages				
8	Random Effects Model				
9	Randomized Block Designs				
10	Multifactor Designs				
11	Two-Factor Experiments I				
12	Two-Factor Experiments II				
13	Mixed Effect Models				
14	2k Multifactor Designs				
Evaluation Methods		Weight(%)			
Midterm Exam		30			
General Exam		70			
Resources					
Design and Analysis of Experiments, 7th Ed. D. C. Montgomery, John Wiley & Sons, 2009.Probability and Statistics for Engineers and Scientists, 9th Ed. R. E. Walpole, R. H. Myers, S. L. Myers and K. Ye , Pearson Education 2012.					