

**ENGINEERING AND TECHNOLOGY MANAGEMENT
GRADUATE PROGRAM
ETM501
APPLIED STATISTICS AND DESIGN OF EXPERIMENTS
Fall 2020**

INSTRUCTOR : Ali Rıza Kaylan (E-mail: kaylan@boun.edu.tr)
OFFICE-HOURS : By appointment
LECTURE HOURS : Saturday 10:00-13:00

Oct.24, 31, Nov. 7, 14, 21, 28, Dec. 5, 12, 19, 26, Jan. 2, 9, 16.

COURSE DESCRIPTION : This course aims to expose experimental design concepts and related statistical modeling tools of data analysis. The students are expected to learn how to plan, design and conduct experiments efficiently and effectively, and also how to analyze the data collected to draw recommendations for the decision makers. Tools and techniques covered are readily usable to solve real life problems in new product design and development, process development, and manufacturing process improvement. Computer software packages (Design-Expert, Minitab) are employed to illustrate the methods presented throughout the course.

COURSE TEXTBOOK : Douglas C. Montgomery, **Design and Analysis of Experiments**, Ninth Edition, John Wiley and Sons, 2017.

COURSE OUTLINE :

	Chapter
1. Role of experimental design in engineering studies	1
2. Review of fundamental statistical concepts	2
a) Descriptive statistics	
b) Random sampling and related distributions	
c) Statistical Inference : Estimation and Hypothesis Testing	
d) Comparison of two treatments, t-test	
3. Comparison of more than two treatments	3-4
a) Analysis of variance	
b) Randomized block design	
c) Latin squares and other block designs	
d) Multiple comparisons	
4. Measuring the effects of variables	5-9
a) Factorial designs	
b) Fractional factorial designs	
5. Regression and correlation analysis	10-11
a) Linear regression	
b) Detection and correction of model violations	
c) Stepwise regression	
d) Response surface methodology	
6. Taguchi Methods	
7. Data Mining and Knowledge Discovery	
8. Six Sigma Methodology	

GRADING:

%30 (3 Quizzes) + %20 (Project) + %20 (Assignments and Class Participation)
+ %30 (Fin) = %100

Software Tools: Design-Expert (Web Site: www.statease.com)
Minitab (Web Site: www.minitab.com)