

INDUSTRIAL ENGINEERING DEPARTMENT

IE 256

Statistics for Industrial Engineers

Spring 2017

Type:	Required
Credits/ECTS:	3 Credits / 6 ECTS
Class/Laboratory/PS schedule:	Tuesday 09:00-10:50 (M1100) – Regular Class Thursday 09:00-09:50 (M1100) – Regular Class Thursday 10:00-10:50 (M1100) – Problem Session
Instructor:	Mustafa Gökçe Baydoğan Office: M4082 (mustafa.baydogan@boun.edu.tr) Office Hours: TBD
Teaching assistant:	TBD
Student assistant:	TBD
Prerequisite(s):	IE 255 (Probability for Industrial Engineers) or equivalents.

Course Description:

This course is organized to introduce the students to basic topics in parametric statistics; estimation, confidence intervals, and hypothesis testing; analysis of variance, regression and correlation analysis and goodness of fit tests. Elementary design of experiments and data collection and computer implementations using available up-to-date statistical software will be covered.

Textbook(s) / other required material:

Walpole, Myers, Myers, Ye: “Probability and Statistics for Engineers and Scientists”, 9th ed., Prentice Hall, New Jersey, USA 2007.

Course objectives (and program outcomes):

This course aims to provide students the fundamentals of statistical methods for collecting, presenting, analyzing and interpreting data. Students will be able to gain knowledge and skills on collection, presentation, analysis, and use of data to make intelligent judgments and informed decisions, solve problems, and design products and processes in the presence of uncertainty and variation. You will be able to draw inferences about the populations based on the sample data analysis. The course should also sharpen individual ‘intuition’ and ‘critical thinking’ about how to read data, interpret data, and judge others’ claims about data. By the completion of the course, the students will be able to;

- Collect, summarize, and interpret data about organizations in a sector or industry
- Designing and analyzing experiments
- Improve quality (e.g., reducing variability, sampling procedures) in production processes
- Presenting government statistical data to lay audiences
- Conducting academic research to generate new data
- Redesign processes based on historical data

Considering these objectives, this course mainly addresses the following student outcomes of

the industrial engineering undergraduate program;

- Student Outcome (a): An ability to apply knowledge of mathematics, science, and engineering
- Student Outcome (b): An ability to design and conduct experiments, as well as to analyze and interpret data
- Student Outcome (e): An ability to identify, model, formulate and solve industrial engineering problems
- Student Outcome (k): An ability to use the techniques, skills, and modern engineering tools necessary for industrial engineering practice.

Topics covered:

1. Review of Probability (Ch 1-7)
2. Collecting Data, Summarizing and Exploring Data (Ch 8)
3. Sampling Distributions of Statistics (Ch 8)
4. Basic Concepts of Inference, Inferences for Single Samples, Two Samples, Proportion and Count Data (Ch 9)
5. Estimation and Hypothesis Testing (Ch 10)
6. Regression Analysis (Ch 11 & 12)
7. Elementary Design of Experiments, Analysis of Variance (ANOVA) (Ch 13)
8. Nonparametric Statistics (Ch 16)

Grading:

Quiz I:	5%
Midterm I:	20%
Project part II:	3%
Quiz II:	5%
Midterm II:	25%
Quiz III:	5%
Final:	30%
Project part II:	7%
Participation (Bonus 2%)	

Prepared by, and date of preparation: Mustafa Gökçe Baydoğan, January 2017