ÇANKAYA UNIVERSITY
Faculty of Engineering
Department of Industrial Engineering

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IE 326 – Quality Engineering (3 2 4) ECTS: 6
Fall 2020

Course objectives

- To introduce the concepts and statistical methods employed in the assurance of product conformance to specification limits.
- To introduce different statistical process control techniques.
- To enlighten students on the importance of reduction in variability in process.
- To introduce acceptance sampling techniques.
- To teach how to conduct and use design of experiments to improve quality of products and processes.

Teaching Assistant

Funda GÜNER, e-mail: fkarabak@cankaya.edu.tr

Course website

http://webonline.cankaya.edu.tr/, students will be automatically enrolled to IE326 course. Check the website frequently for announcements.

Text

Montgomery D.C. (2013), *Statistical Quality Control: A Modern Introduction*, 7th ed., Wiley

Lectures & Recitations

Lectures and recitations will be held at the time and place indicated in the following table. MS Powerpoint slides as well as on-the-board problem solving techniques will be used during the lectures. Recitations will cover the problems for the associated week. Bring your calculators to class.

Section	Lecture	First week zoom ID and passcode
01	Monday 10:20 – 13:10 Zoom	Meeting ID: 998 2634 8638 Passcode: 723427

Section	Recitation	First week zoom ID and passcode
01	Monday 16:20-17:10 Zoom	Meeting ID: 822 8094 4852 Passcode: aRff8T
01	Tuesday 12:20-13:10 Zoom	Meeting ID: 813 4432 7911 Passcode: Rexw48

Attendance:

- Minimum required attendance to lectures is 45%. Minimum required attendance to recitations is 45%. However, it is strongly recommended to attend all the lecture and recitation hours.
- Attendance will be taken every lecture and recitation hour.

Conditions that may lead to the letter grade "NA":

- Not attending the Midterm Exam and the Final Exam.
- Having less than 45% attendance to lectures and recitations.
- Not submitting a Term Project report.

Homework

There will be three homework assignments related to the recitation problems. Use of either Minitab or statistical functions in MS Excel might be required for homework assignments. Homework assignments are due **on Sunday of the submission week at 23:55** and should be uploaded to the course website (**not** to the teaching assistant). Homework assignments will be submitted as a group of at most 2 to 3 students. In case of **plagiarism (copying)**, students will get a zero from the homework assignment and university **discipline** regulations will be applied.

Term Project and Report

There will be a term project for the application/research of statistical concepts in this course. The term project will be done with project teams of **four or five students**. Guidelines for the term project will be provided at the course website. The term project report is going to be submitted **at the end of Week 14**.

At week 6, students should form their groups and inform course assistant by e-mail. The deadline of group formation is **Friday of week 6 at 23:55**. Groups will include **four or five students**. Those who do not/cannot form a group will be grouped by the instructor. These groups will be valid only for the term project. Detailed information about the content of the project will be announced later.

Tentative Course Schedule

Every student should check course web site regularly; and is responsible for the material of the week, and announcements made at the course web site.

Week	Lecture (Topic)	To-Do
1	Introduction to Quality and Quality Improvement Concept	Read Chapter 1
2	DMAIC Process	Read Chapter 2
3	Review of fundamental statistical concepts	Read Chapter 3 and 4
4	Graphical tools for quality improvement	Read Chapter 5, Upload **homework 1**
5	Statistical Process Control methods and techniques	Read Chapter 5,
6	Control Charts for Variables: X-R	Read Chapter 6 **E-mail project groups**
7	Control Charts for Variables: X-S	Read Chapter 6
8	Control Charts for Attributes	Read Chapter 7, Upload **homework 2**
9	Process Capability Analysis	Read Chapter 8
10	Acceptance Sampling for Attributes	Read Chapter 15
11	Acceptance Sampling for Variables	Read Chapter 16
12	Designed Experiments: 2^k Factorial Design	Read Chapter 13
13	Two Level Fractional Factorial Designs	Upload **homework 3**
14	Quality Management System Standards	**Submit term project report**

Tentative Grading (*)

Assessment Tool	Quantity	Percentage
Term Project	1	20
Homework	3	15
Midterm Exam	1	25
Final Exam	1	40

(*) Instructor reserves the right to change the grading policy

Exams & Make-Ups

Exams will include questions related to short description of main concepts (~15%) and quantitative (~85%) problems. Qualitative part will be from in-class lecture notes that do not appear in lecture slides. Quantitative questions will be similar to recitation and homework questions. Midterm exam will be held via webonline platform. Final exam might be face-to-face depending on the severity of Covid-19 pandemics.

Students should prepare **bring one A4 size formula sheet** that can be used during exams. Make sure that you **only** write formula to the sheet. **If you have solved problems and/or verbal explanations in your sheet, it will be collected in the exam.** If a student misses an exam with a valid excuse, then he/she will get a make-up exam according to the rules in university by-laws. A make-up exam might contain different type of questions than the regular exam.