

THE UNIVERSITY OF TEXAS AT EL PASO – COLLEGE OF ENGINEERING
DEPARTMENT OF INDUSTRIAL, MANUFACTURING, AND SYSTEMS ENGINEERING

IE 4385 Statistical Quality Control & Reliability

1. **Course number and name:** IE 4385 Statistical Quality Control
2. **Credits and contact hours:** 3 credits – 2 lectures per week - 1.5 hours per lecture
3. **Instructor's or course coordinator's name:** Dr. Francisco Oswaldo Aguirre
4. **Text book, title, author, and year:** Montgomery D. C. (2012). Introduction to Statistical Quality Control. 7th Edition. Ed. Wiley

a. **other supplemental materials:**

reference books:

1. Besterfield D. H. (2009). Quality Control. 8th Edition. Ed. Prentice Hall.
2. Krishnamoorthi K. S. (2006). A First Course in Quality Engineering. 1st Edition. Ed. Prentice Hall.
3. Devor R. E., Chang T-H. and Sutherland J. W. (2006). Statistical Quality Design and Control. 2nd Edition. Ed. Prentice Hall.
4. Elsayed E. A. (2012). Reliability Engineering, 2nd Edition, Ed. Wiley
5. Nachlas J. A. (2005). *Reliability Engineering: Probabilistic models and maintenance methods*, 1st Edition, CRC Press
6. Leemis L. M. (2009). Reliability: Probabilistic Models and Statistical Methods, 2nd Edition, Prentice Hall.
7. Vardeman, S. B. and Jobe, J. M. (1998). Statistical Quality Assurance Methods for Engineers. 1st Edition, Ed. Wiley

b. **software:** Minitab (available on my.apps.utep.edu)

5. **Specific course information**

a. **brief description of the content of the course (catalog description):**

The objective of this course is to teach students statistical methods for quality control and reliability. Topics include control charts for variables and attributes data, process capability studies acceptance sampling procedures and reliability engineering. New topics and recent trends in quality engineering are introduced including SPC for Short Production Runs, EWMA chart and Six Sigma. The Philosophies of Dr(s). Deming, Juran, and Taguchi are surveyed.

b. **prerequisites or co-requisites:** IE 3373 with a grade of "C" or better.

c. **indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program:** Required course.

6. **Specific goals for the course**

a. **specific outcomes of instruction:**

- Students will know major concepts of operations research, such as linear programming, simplex algorithm, and optimization

- Student will develop skills for identifying; formulating, solving, and interpreting appropriate models.
- Students will understand how the mathematical concepts are applied in the real-world and to learn to effectively use computing software to solve more complicated problems such as they arise in the real world.
- Students will understand the important of quality and the prevailing quality philosophy in use today.
- Students will learn the importance of "statistical thinking" in industry.
- Students will understand concepts of common and special cause random variation.
- Students will understand sampling techniques for assessing product quality.
- Students will understand the usefulness and theory behind use of Shewhart control charts.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course:

Student Outcomes						
1	2	3	4	5	6	7
X					X	

7. Brief list of topics to be covered

Probability Theory, Random Variables, Probability Mass Function, Probability distributions, Hypothesis Testing, Variable Control Charts, Attribute Control Charts, Source of Variation, Six Sigma, Quality Tools.