Course: ISE 435/535 Quality Control and Reliability 3 credit hours

Description: Application of statistics to control of quality and reliability in products and services. Design of acceptance sampling and process control systems, including attention to inspection and test methods. Design and implementation of quality assurance programs, including nonstatistical dimension of quality systems

Sessions: MWF 11:10 AM 203 RTEC Final Exam Tuesday, 3/17 at 8:10 AM

Instructor: Dr. Trevor S. Hale 275 Stocker 3-1543
halet@ohio.edu http://www.ent.ohiou.edu/~thale

Office hours: M 2:00 to 5:00 and by appointment

Textbook: Introduction to Statistical Quality Control, Montgomery, 4th edition

Objectives: To learn, acquire, and develop a set of engineering tools that the student can use to help solve quality problems.

Prerequisite: ISE 306

Outcomes: Apply appropriate charting techniques
Estimate process capability measures
Develop appropriate sampling plans
Construct and utilize models which describe equipment failure
Determine and utilize mean time between failures (MTBF)
Explain basic reliability models

Homework: No late homework will be accepted.

Grading: 40% Homework and pop quizzes
17.5 % First midterm: Friday, 2/11
17.5 % Second midterm: Friday, 3/4
25% Final exam: Tuesday, 3/17 at 8:10 AM

Attendance: Attendance is not required but it is encouraged. Prior notification of absences is also encouraged.

Academic: At the discretion of the instructor, an F for the course will be given for the first academic misconduct offense.

Schedule: Quality improvement today (Chp. 1)
Modeling process quality (Chp. 2)
Inferences about process quality (Chp. 3)
Statistical process control (Chp. 4)
Control charts for variables (Chp. 5)
Control charts for attributes (Chp. 6)
Process measurement system and capabilities (Chp. 7)
CUSUM and EWMA control charts (Chp. 8)
Acceptance sampling plans (Chp. 14)
Intro to design of experiments (Chp. 12 – time permitting)

ISE 435/535 Homework Assignments

Present and annotate all work
You may seek help from other students however…
You must list the names of those students on your cover page
All assignments are to be professionally word-processed
Computer use in working the problems is encouraged but is not required
Staple all assignments in upper left hand corner (no paperclips or torn edges)

Assignment 1: Due January 17

Chapter 2: 1, 2, 5, 6, 15, 16, 17, 18, 21, 22

Assignment 2: Due January 31

Chapter 3: 6, 8, 14, 18, 25
Chapter 4: 21, 23, 24, 28, 32

Assignment 3: Due February 14

Chapter 5: 4, 5, 11, 16, 35, 37, 43
Chapter 6: 2, 8, 15, 29, 36, 40, 53, 58

Assignment 4: Due February 28

Chapter 7: 4, 5, 6, 13, 15, 22, 23, 27, 34
Chapter 8: 1, 4, 8, 9, 30, 31

Assignment 5: Due March 11

Chapter 14: 1, 2, 3, 4, 5, 7, 10, 12
Chapter 12: 2, 4 (time permitting)

ISE 435/535 Sample Homework Solution

(staple)

Last Name, First
Student number

Assignment Z

Page 252 #13

A machine is producing metal pieces that are cylindrical in shape…

Sample statistics: $\bar{x} = 1.0056$
$s = 0.024552$
$n = 9$

A (1-α) 100% confidence interval for m with σ unknown is

$$\bar{x} - t_{\alpha/2}\frac{s}{\sqrt{n}} < \mu < \bar{x} + t_{\alpha/2}\frac{s}{\sqrt{n}}$$

$\alpha = 0.01$ and $v = 9$

Therefore $t_{\alpha/2} = 3.355$

Substituting known values, a 99% confidence interval for the mean diameter is

$$1.0056 - 3.355\frac{0.024552}{\sqrt{9}} < \mu < 1.0056 + 3.355\frac{0.024552}{\sqrt{9}}$$

$$0.9781 < \mu < 1.0331$$

ISE 435/535 Sample Cover Sheet

(staple)

ISE 435/535
Assignment Z

Received help from:
Student name
Student name
Student name

Submitted by:
Student name
Student number
Date