

San Jose State University
Department of Aviation and Technology
Charles W. Davidson College of Engineering
Tech 31 – Quality Assurance and Control
Spring, 2015

Instructor: **Ali M. Zargar, Ph.D.**
Class Time: Th: 9:00 -10:45 Lecture
Class Location: Mac Quarry Hall Room 324 for Lecture

Lab Time: Tu: 9:00-11:45 for Section 11 &
Monday: 9:00 – 11:45 for Section 12
Lab Location E 103

Office Hours: Tu: 1:30 – 3:30 PM and by appointment
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Catalog Description

Introduction to concepts and statistical methods that companies use to manage and improve quality. Sampling inspection, statistical process control, quality function deployment, cost of quality, design of experiment and Taguchi's method for designing in quality. Prerequisite: BUS 90 or equivalent. Misc/Lab: Lecture 2 hours/lab 3 hours.

Purpose of Course

This course is required for all majors with concentration in manufacturing systems and computer electronics technology programs, and is designed for developing an understanding and working knowledge of the concepts, principles, and applications of Quality as related to an industrial environment. Tech 31 has both lecture and lab components designed to augment the contents of its instructional units. The course is divided into five (5) instructional units. Each unit has associated objectives and assigned readings related to those objectives. Within these are lab exercises, individual and group projects designed for a comprehensive understanding of quality systems.

Required Textbook and Materials

1. Besterfield, D., (2013). Quality Improvement (9th. Ed). Englewood Cliffs, NJ: Prentice Hall.

General Course Goals

1. Comprehend quality issues and their implications to industry and society.
2. Develop a general understanding of common quality systems employed in industry.
3. Understand basic statistical principles inherent in modern quality control systems.
4. Design appropriate quality systems to solve industrial quality problems.
5. Develop a higher responsible attitude regarding quality matters.

Outline of Course Content and Unit Objectives:

UNIT 1: Introduction to Quality Improvement

- a. Introduction
- b. Lean Enterprise
- c. Six Sigma
- d. Statistical Process Control (SPC)
- e. Fundamentals of Statistics
- f. Fundamentals of Probability

Reading List for Unit 1:

1. Besterfield, pp. 1-53
2. Lecture, presentations, handouts as needed

UNIT 2: Control Charts for Variables

- a. Introduction
- b. Control Chart Techniques
- c. State of Control
- d. Specification
- e. Process Capability
- f. Other Control Charts

Reading List for Unit 2:

1. Besterfield, pp. 58-90
2. Lecture, presentations, handouts as needed

UNIT 3: Additional SPC Techniques for Variables

- a. Continuous and Batch Processes
- b. Multi Vari Chart
- c. Short-Run SPC
- d. Gauge Control

Reading List for Unit 3:

1. Besterfield, pp. 95-108
2. Lecture, presentations, handouts as needed

UNIT 4: Control Charts for Attributes

- a. Control Chart for Nonconforming (Defective) Units
- b. Control Charts for Count of Nonconformities (Number of Defects)
- c. Quality Rating Systems

Reading List for Unit 4:

- 1. Besterfield, pp. 123-142
- 2. Lecture, presentations, handouts as needed.

UNIT 5. Acceptance Sampling

- a. Fundamental Concepts of Sampling
- b. Statistical Aspects
- c. Sampling Plan Design
- d. Sampling Plan Systems
- e. Reliability
 - i. Fundamental Aspects
 - ii. Statistical Aspects
 - iii. Life & Reliability Testing Plans

Reading List for Unit 5:

- 1. Besterfield, pp. 149-166 & pp. 169- 175
- 2. Lecture, presentations, handouts as needed

Reading Assignments

All reading assignments should be completed before their assigned dates. Students are expected to be prepared to discuss them on those dates. Reading materials should be read before they are discussed in class.

Evaluations

Quizzes/In-Class Assignments (30 points):

There will be quizzes and pop in-class assignments. It will be the responsibility of the student to attend all classes, **no makeups unless for extreme circumstances.**

Mid-Terms and Final (175 points):

There will be two (2) exams in the course of the semester, **one mid-term and one final.** The mid-term is worth 75 points; the final is worth 100 points. The final exam **will be comprehensive** and will be administered during the scheduled time in exam week, **no makeups unless for extreme circumstances.**

Research and Laboratory Assignments (205 points): Please refer to and follow Dr. Obi's Lab Greensheet. Points earned in Dr. Obi's Lab and the Lecture points earned will be added to calculate your final grades as shown below:

Semester Grading:

Specific laboratory assignments, quizzes, exams or exercises will be equated and graded as follows:

One mid-term (Lecture)	= 75
One final exam (Lecture)	= 100
Lab exercises and assignments	= 75
One group laboratory research activity	= 50
Lab activity presentation	= 80
Quizzes/In-class Assignments (Lecture)	= 30
Total possible points	=410

All of the above criteria will be logged in by the point system and will be totaled at the end of the semester to be converted to the following letter grades:

A+ = 100-97%	A = 96-93%	A- = 92-90%
B+ = 89-87%	B = 86-83%	B- = 82-80%
C+ = 79-77%	C = 76-73%	C- = 72-70%
D+ = 69-67%	D = 66-63%	D- = 62-60%
F = 59-0%		

University Policy Information

a) Academic integrity statement (from Office of Judicial Affairs): “Your own commitment to learning, as evidenced by your enrollment at San José State University, and the University’s Academic Integrity Policy requires you to be honest in all your academic course work.

Faculty members are required to report all infractions to the Office of Judicial Affairs. The policy on academic integrity can be found at (<http://www2.sjsu.edu/senate/S04-12.pdf>).

b) Campus policy in compliance with the Americans with Disabilities Act: “If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with DRC to establish a record of their disability.”

TECH 31 – Quality Assurance and Control, Spring 2015 Course Schedule
The schedule is subject to change with fair notice given orally in class.

Course Schedule

Week	Date	Topics, Readings, Assignments
1	1/22/2015	Orientation to the course. Please start reading Unit 1.
2	1/29/2015	Lecture on Unit 1 covering pp. 1-53. Please finish reading Unit 1
3	2/05/2015	Lecture on Unit 1 continued. Start the reading for Unit 2, we need more time to finish Unit 1. Unit 2 should be read/studied thoroughly.
4	2/12/2015	Lecture on Unit 2. Control charts concept is the backbone of quality assurance and we will spend quite a bit of time on it. We may do some in-class problems.
5	2/19/2015	Lecture on Unit 2 will continue and time permitting we will do some in-class problems. Start glancing through Unit 3
6	2/26/2015	Finish up Unit 2 and time permitting Start lecturing on Unit 3. Finish reading Unit 3.
7	3/05/2015	Lecture on Unit 3 and do some problem in class. Start preparing for the Midterm
8	3/12/2015	Finish Unit 3 lecture and do some typical problems at the end of chapters similar to the one that may appear in Midterm.
9	3/19/2015	Midterm - it will cover everything that we have covered in the course up to this point. The midterm is close book and notes. Glance through Unit 4
10	3/26/2015	Spring Recess – No Class
11	4/02/2015	Review Midterm , start lecture on Unit 4. Please Finish reading for Unit 4. Unit 4 is about control charts for attributes and it is important.
12	4/09/2015	Continue lecturing on Unit 4 and do some problems in class. Please glance through Unit 5.
13	4/16/2015	Wrap up Unit 4 and start lecture on Sampling. Sampling concept is not as intuitive as control charts so study it carefully.
14	4/23/2015	Continue Unit 5 lecture and do some example problems in class. Please finish reading for Unit 5 and carefully study the Reliability section pp. 169-175.
15	4/30/2015	Lecture on Unit 5 is continued. In-class problems if time permits,
16	5/07/2015	Catching up and review for the final exam – Last Day of Instruction
Final Exam	5/21/2015	Mac Quarry Hall Room 324; Time 7:15 – 9:30