San Jose State University
Department of Aviation and Technology
Charles W. Davidson College of Engineering

Tech 31: Quality Assurance and Control, Section 1, Fall, 2017

Course and Contact Information

Instructor: Dr. Samuel C. Obi

Office Room: IS 105

Office Phone: (408) 924-3218

Email Address: Samuel.obi@sjsu.edu

Office Hours: M: 12:00 Noon – 2:00 PM and by appointment

Class Day & Time: MW: 9:00 -10:15 Lecture

Class Location: IS 216

Prerequisite: BUS 90 or equivalent

Course Materials
Copies of the course materials including the syllabus, lecture slides, projects, etc. may be found at http://www.sjsu.edu/people/samuel.obi/

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. (Seminar 9 hours per week, 3 hours in class, 6 hours by arrangement)

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 lecture and activity 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 individual and group exercises designed for a comprehensive understanding of quality systems.

Course Learning Outcomes

1. Demonstrate strong communication, critical thinking and interpersonal skills
2. Demonstrate skills in team development, dynamics, and management to work as team players
3. Demonstrate skills in the planning and design of manufacturing processes.
4. Use the principles of production scheduling & planning in an industrial environment

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
1. industry.
2. Understand basic statistical principles inherent in modern quality control
3. systems.
4. Design appropriate quality systems to solve industrial quality problems.
5. Develop a higher responsible attitude regarding quality matters.

Required Textbook and Materials

1. Besterfield, D., (2012). Quality Improvement (9th. Ed). Englewood Cliffs, NJ: Prentice Hall. **(Required)**
2. Scientific hand calculator
3. Laptop/notebook computer with ample memory and speed (**highly recommended)**
4. Any handbook on learning Microsoft Excel or other spreadsheets
5. A digital caliper for taking linear measurements to 4 or more decimal places is highly recommended
6. A digital electronic test instrument for taking voltage, current, resistance or related measurements to 4 or more decimal places is highly recommended
7. There may be need to purchase about 1250, 1”-diameter (or square), ¼” thick wooden or plastic draughts (checkers) for group research activity. More details will be provided later.

<u>Outline of Course Content and Unit Objectives:</u>

UNIT 1: Introduction to Quality Improvement

a. Investigate the definitions and importance of quality
b. Review quality improvement techniques
c. Utilize quality management and planning tools
d. Conceptualize the importance of quality
e. Familiarize with the cost of quality

Reading List for Unit 1:

1. Besterfield, pp. 1-26; 184-193
2. Lecture, presentations, handouts, etc.

3. Videos:
   i. XS0527 vol.1: In search of quality
   ii. XS0528 vol.2: Quality through systems
   iii. XS-2767: Theory of Constraints: meeting customer demand with synchronized production

UNIT 2: Fundamentals of Statistics

a. Comprehend the role of statistics as essential components in quality control tasks
b. Recognize common statistical graphics used in quality control
c. Perform basic statistical computations used in quality control operations

Reading List for Unit 2:

1. Besterfield, pp. 27-57
2. Lecture, presentations, handouts, etc.
3. Videos:
   i. XU1286B
   ii. XU1287A
   iii. XU1287B

UNIT 3: Quality Systems I (Control Charts for Variables)

a. Conceptualize the principles of the control charts
b. Examine different control charts for variables
c. Investigate the statistical process control (SPC) technique
d. Design quality systems for variables

Reading List for Unit 3:

1. Besterfield, pp. 58-94
2. Lecture, presentations, handouts, etc.
3. Videos:
   i. XU1294B

UNIT 4: Quality Systems II (Control Charts for Attributes)

a. Review the fundamentals of probability
b. Examine different control charts for attributes
c. Apply control chart technique to attribute data
d. Design quality systems for attributes

Reading List for Unit 4:

1. Besterfield, pp. 110-148
2. Lecture, presentations, handouts, etc.
3. Video presentation on quality (contingent upon time availability)

UNIT 5. Quality Systems III (Total Quality Management)

a. Conceptualize the rationale in total quality management (TQM)
b. Review components of TQM and other quality tools

c. Examine TQM techniques
d. Comprehend the role of computers in quality control

Reading List for Unit 5:

1. Besterfield, Review of previous sections + pp. 95-109 and 149-168.
2. Lecture, presentations, handouts, etc.
3. Video presentation on TQM (XS0706) (contingent upon time availability)

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.

Course Requirements and Assignments

All assignments with description, due dates, and submission guidelines will be adhered to as specified on the schedule or by instructor. No late submissions will be accepted, unless special arrangements are made with the instructor before the posted due date.

A. Four (4) Unit Assignments @ 15 points apiece (60 points)

There will be four (4) take-home assignments. It will be the responsibility of the student to attend all classes so as not to miss any of these. **No makeups unless for extreme circumstances.**

B. Three (3) Quizzes @ 10 points apiece (30 points):

There will be three (3) announced quizzes. It will be the responsibility of the student to attend all classes so as not to miss any of these. **No makeups unless for extreme circumstances.**

C. Five In-Class Assignments @ 10 points apiece (50 points):

There will be five (5) in-class assignments. It will be the responsibility of the student to attend all classes so as not to miss any of these. **No makeups unless for extreme circumstances.**

D. Mid-Term 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.**

E. Research Assignments (130 points):

Each student will be responsible for the completion of three (3) research assignments designed for familiarization of quality systems, distributed in the following categories:

1. Two (2) individual research assignments @ 40 points apiece (80 points)
2. One (1) group research assignment (50 points)

No late assignment will be accepted. Each student will be evaluated on his or her activities based on participation in those activities as evidenced by quality of work, instructor's observation, documentation, presentations, etc. Students also should behave in an orderly manner in all class activities.

Semester Grading:
Specific research assignments, quizzes, exams or exercises will be equated and graded as follows:

Four take-home assignments	= 60
Three Quizzes (10 x 3)	= 30
Five Class assignments (10 X 5)	= 50
One mid-term	= 75
One final exam	= 100
Two individual research exercises @ 40 points apiece	= 80
One group research exercise	= 50
Total possible points	**= 445**

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%		

Percentages will be adjusted to accommodate + and - grades

University Policies
Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/**"**

Class Usage and Housecleaning
Since the bulk of the course will be undertaken using class computers and other equipment, it is imperative that all students use those equipment and class rooms in a safe manner as outlined. Specifically, the following rules must be followed:

a) No drinking, eating or smoking around any computing equipment
b) No horse play or disorderly conduct in the classroom or lab environment

c) All computer usage during class time must be related to the course (Tech 31) assignment at hand
d) All workstations and surrounding must be cleaned by the students who made use of them at the end of class and lab sessions
e) All computers and peripherals should be used in a responsible manner. Students may be charged for damages to any equipment resulting from their fault
f) If any equipment is found to be in repair, report it to the instructor immediately. Do not attempt to use the equipment or repair it.
g) Class participation and attendance are strongly encouraged. No cell-phones are allowed during class.

Schedule of Course Semester Activities

Week Of:	**Topics to Be Discussed**	**Assignments**	**Due**
Aug. 23 (Wed)	Orientation	**Buy Materials**	
Aug. 28	Review of Microsoft Excel	Excel Material	
~~Sep. 4~~ (Wed 6)	Unit 1: Introduction To QC (Besterfield, PP. 1-26; 184-193)	**Assignment 1 Issued**	**Quiz 1**
Sep. 11	Unit 1: Introduction To QC (Besterfield, PP. 1-26; 184-193)	**Research 1 Begins**	**Assignment 1**
Sep. 18	Unit 2: Fund. of Statistics (Besterfield, PP. 27-57)	Research 1	
Sep. 25	Unit 2: Fund. of Statistics (Besterfield, PP. 27-57)	Research 1	
Oct. 2	Unit 3: Quality Systems (Control Charts for Variables) (Besterfield, PP. 58-94)	**Presentations** **Assignment 2 Issued**	**Research Report (1)**
Oct. 9	Unit 3: Quality Systems (Control Charts for Variables) (Besterfield, PP. 58-94)	**Research 2 Begins**	**Quiz 2**
Oct. 16	**Mid-Term Exam** Unit 4: Quality Systems Ii (Control Charts for Attributes) (Besterfield, PP. 110-148)	Research 2	**Assignment 2**

Oct. 23	Unit 4: Quality Systems Ii (Control Charts for Attributes) (Besterfield, PP. 110-148)	**Presentations** **Group Exercise Begins**	**Research Report (2)**
Oct. 30	Unit 5: Quality Systems III (Total Quality Management) (Besterfield, Review of Previous Sections + PP. 95-109 And 149-168)	**Assignment 3 Issued**	
Nov. 6	Unit 5: Quality Systems III (Total Quality Management) (Besterfield, Review of Previous Sections + PP. 95-109 And 149-168)	Group Exercise	**Assignment 3**
Nov. 13	Other Quality Topics	**Assignment 4 Issued**	
Nov. 20/~~22~~	Review/Adjustment, Etc.	Group Exercise	**Assignment 4**
Nov. 27	Last Week of Research	Group Exercise	**Quiz 3**
Dec. 4	**Group Presentations**	**Group Presentations**	**Group Reports**
Dec 11	**Last Day of Class** **Final Exam Review**	**Study for Final Exam**	
Dec 18	**Final Examination**	**Monday, Dec. 18, From 7:15 - 9:30 AM**	

THIS SCHEDULE IS SUBJECT TO CHANGES DUE TO CIRCUMSTANCES DURING THE SEMESTER

Posted Weeks are Mondays Unless Specified

Information in Bold Indicates Importance

All Assignments are Due on Wednesdays Unless Changed by Instructor

Monday, September 4 is Labor Day (Campus Closed)

Friday, November 10 is Veteran's Day (Campus Closed)

November 22 is Non-instructional Day

November 23 – 24 is Thanksgiving Holiday (Campus Closed)