

**Tech 31-01 – Quality Assurance and Control  
Course Syllabus and Outline, Spring, 2017**

**General Course Information**

Instructor:	Ali M. Zargar, Ph.D.
Class Time:	Mon & Wed: 9:00 – 10:15
ENGR:	E-301
Office Hours:	Mon.: 11:00 – 12:00 & Tue.: 12:00 – 1:00
Office Room:	IS 102
Office Phone:	(408) 924-3194
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	(assignments are not accepted by FAX)
E-mail Address:	<a href="mailto:ali.zargar@sjsu.edu">ali.zargar@sjsu.edu</a>
<b><u>Prerequisite:</u></b>	<b><u>BUS 90 or equivalent.</u></b>

**Course Format**

This course is a Lecture course, combining weekly lectures with various assignments to support the material learned in lectures. Delivery is in-person with web augmentation for course documents, assignments, and record keeping, using the SJSU Campus CANVAS shell. Students will find it convenient, but not required, to have access to a laptop computer during class meetings.

**Faculty Web Page and MYSJSU Messaging**

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the Canvas learning management system course website. You are responsible for regularly checking with the messaging system through MySJSU (or other communication system as indicated by the instructor) to learn of any updates. In addition, lecture notes, slides presented in class, and other course material will be posted in the CANVAS learning system shell. The material will normally be posted the evening of the class meeting in which it was discussed.

**Catalog Description and Overview**

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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. Lecture 3 hours.

## Overview of Course

This is a core course required for all BS Industrial Technology majors and is designed to help students develop an understanding and working knowledge of the concepts, principles, and applications of Quality as related to industrial and business environments. Tech 031 includes lecture, activity, and homework 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 class activities, and individual and group projects designed for a comprehensive understanding of quality systems.

## Student Learning Objectives

Students who complete this course will be able to

1. SLO1 List and describe quality issues and their implications to industry and society.
2. SLO2 Demonstrate through discussion and writing a general understanding of common quality systems employed in industry.
3. SLO3 Identify and discuss basic statistical principles inherent in modern quality control systems.
4. SLO4 Design and prepare for implementation of appropriate quality systems to solve industrial quality problems.
5. SLO5 Demonstrate and discuss ethics as they apply to this discipline, demonstrating a responsible attitude regarding quality issues.

## Required Textbook and Materials

1. Besterfield, D., Quality Improvement (9th. Ed, 2012). Prentice Hall publisher.
2. Scientific hand calculator
3. Any handbook on learning the Microsoft Excel spreadsheet program
4. Recommended: Laptop/notebook computer running a current version of MS Excel

## 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

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

## Evaluations

### Quizzes and In-Class Assignments (100 points):

There will be pop quizzes and in-class assignments. It will be the responsibility of the student to attend all classes and complete all class activities. There will be no makeups except for extreme circumstances that must be documented.

### 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. Both exams will be comprehensive and the final will be administered during the scheduled time in exam week. There will be no makeups unless for extreme circumstances that are documented.

### Research Project Assignment (125 points):

Please refer to and follow the Research Project Assignment Guide.

### Semester Grading:

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

Midterm Examination	75
Final Examination	100
Class quizzes, exercises, and assignments	100
Research project deliverables	100
Class research project presentation	25
Total possible points	400

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

### Grading Scale:

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%		

## **Classroom Protocol**

To facilitate learning, **please have all cell phones turned off or on “silent” during class.** Please **do not send text messages, listen to music, or browse the internet during class,** as this is a distraction to you and the other students. Computers may be used for taking notes, but other uses are a distraction and not permitted. No food is allowed in the classroom. Students are expected to attend class regularly, arrive on time, and be prepared to participate (see [University policy F69-24](#), above).

## **University Policies**

### **General Expectations, Rights and Responsibilities of the Student**

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU’s policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arise. See [University Policy S90–5](#) at <http://www.sjsu.edu/senate/docs/S90-5.pdf>. More detailed information on a variety of related topics is available in the [SJSU catalog](#), at <http://info.sjsu.edu/web-dbggen/narr/catalog/rec-12234.12506.html>. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

### **Dropping and Adding**

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s [Catalog Policies](#) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](#) at [http://www.sjsu.edu/provost/services/academic\\_calendars/](http://www.sjsu.edu/provost/services/academic_calendars/). The [Late Drop Policy](#) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes. Information about the latest changes and news is available at the [Advising Hub](#) at <http://www.sjsu.edu/advising/>.

### **Consent for Recording of Class and Public Sharing of Instructor Material**

[University Policy S12-7](#), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor’s permission to record the course and the following items to be included in the syllabus:

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for

your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”

- It is suggested that the greensheet include the instructor’s process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
- In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

### **Academic integrity**

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct) is available at <http://www.sjsu.edu/studentconduct>.

### **Campus Policy in Compliance with the American Disabilities Act**

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with your instructor as soon as possible, or see him/her during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at [http://www.sjsu.edu/president/docs/directives/PD\\_1997-03.pdf](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

### **Accommodation to Students' Religious Holidays**

San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. See [University Policy S14-7](http://www.sjsu.edu/senate/docs/S14-7.pdf) at <http://www.sjsu.edu/senate/docs/S14-7.pdf>.

### **Student Technology Resources**

Computer labs for student use are available in the [Academic Success Center](http://www.sjsu.edu/at/asc) at <http://www.sjsu.edu/at/asc> located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be

available in your department/college. Computers are also available in the Martin Luther King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

## **SJSU Peer Connections**

Peer Connections, a campus-wide resource for mentoring and tutoring, strives to inspire students to develop their potential as independent learners while they learn to successfully navigate through their university experience. You are encouraged to take advantage of their services which include course-content based tutoring, enhanced study and time management skills, more effective critical thinking strategies, decision making and problem-solving abilities, and campus resource referrals.

In addition to offering small group, individual, and drop-in tutoring for a number of undergraduate courses, consultation with mentors is available on a drop-in or by appointment basis. Workshops are offered on a wide variety of topics including preparing for the Writing Skills Test (WST), improving your learning and memory, alleviating procrastination, surviving your first semester at SJSU, and other related topics. A computer lab and study space are also available for student use in Room 600 of Student Services Center (SSC).

Peer Connections is located in three locations: SSC, Room 600 (10th Street Garage on the corner of 10<sup>th</sup> and San Fernando Street), at the 1st floor entrance of Clark Hall, and in the Living Learning Center (LLC) in Campus Village Housing Building B. Visit [Peer Connections website](http://peerconnections.sjsu.edu) at <http://peerconnections.sjsu.edu> for more information.

## **SJSU Writing Center**

The SJSU Writing Center is located in Clark Hall, Suite 126. All Writing Specialists have gone through a rigorous hiring process, and they are well trained to assist all students at all levels within all disciplines to become better writers. In addition to one-on-one tutoring services, the Writing Center also offers workshops every semester on a variety of writing topics. To make an appointment or to refer to the numerous online resources offered through the Writing Center, visit the [Writing Center website](http://www.sjsu.edu/writingcenter) at <http://www.sjsu.edu/writingcenter>. For additional resources and updated information, follow the Writing Center on Twitter and become a fan of the SJSU Writing Center on Facebook. (Note: You need to have a QR Reader to scan this code.)



## **SJSU Counseling Services**

The SJSU Counseling Services is located on the corner of 7th Street and San Fernando Street, in Room 201, Administration Building. Professional psychologists, social workers, and counselors are available to provide consultations on issues of student mental health, campus climate or psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit [Counseling Services website](http://www.sjsu.edu/counseling) at <http://www.sjsu.edu/counseling>.

### **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

##### **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. 58-86
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 A: Fundamentals of Probability

- a. Introduction
- b. Basic Concepts
- c. Theorems of probability
- d. Discrete Probability Distributions
- e. Continuous Probability Distribution
- f. Distribution Interrelationship

##### Reading List for Review Unit

1. Besterfield, pp. 110-120
2. Lecture, presentations, handouts as needed

#### UNIT 4 B : Control Charts for Attributes

- a. Introduction
- b. Control Chart for Nonconforming (Defective) Units
- c. Control Charts for Count of Nonconformities (Number of Defects)
- d. 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

##### Reading List for Unit 5:

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

#### UNIT 6. Reliability

- a. Fundamental Aspects
- b. Statistical Aspects
- c. Life & Reliability Testing Plans

##### Reading List for Unit 6:

1. Besterfield, 169- 175
2. Lecture, presentations, handouts as needed

**TECH 31-01: Quality Assurance and Control**  
**Spring 2017 Course Schedule**

*This schedule is subject to change with fair notice, given orally in class.*

<b><i>Date</i></b>	<b><i>Topics, Readings, and Assignments</i></b>
1/30/17	Orientation to the course. Start reading Unit 1
2/01/17	Lecture on Unit 1. Lean Enterprise, Six Sigma, SPC, Fundamental of
2/06/17	Lecture on Unit 1 continued.
2/08/17	Lecture on Unit 2. Control Charts for Variables, Control chart Techniques, State of Control, Specifications, and Process Capability.
2/13/17	Unit 2 continued...
2/15/17	Unit 2 continued + In-class problem, time permitting.
2/20/17	Lecture on Unit 3. Additional SPC Techniques for Variables - Continuous and Batch Processes , Multi Vari Chart , Short-Run SPC, Gauge Control
2/22/17	Lecture on Unit 3 Continued...
2/27/17	Lecture on Unit 3. Will do some in class problems.
3/01/17	Finish Unit 3 lecture.
3/06/17	Lecture Unit 4A – Fundamentals of Probability – Discrete Probability Distributions, Continuous Probability Distributions, Distribution Interrelationship.
3/08/17	Unit 4A continued
3/13/17	Finish Unit 4A and time permitting do In-class problems
3/15/17	Catching up as needed and do in-class problem.
3/20/17	Discus Midterm and how to prepare for it.
<b>3/22/17</b>	<b>Midterm – the exam will be comprehensive, covering everything in the course up to this point. The midterm is closed book and notes.</b>
3/27 & 3/29	<i>Spring Recess – No School</i>
4/03/17	Review Midterm. Start lecture on Unit 4B – Control Charts for Attributes; Control Charts for Nonconforming Units; Control Charts for Count of nonconformities.
4/05/17	Continue lecture on Unit 4B. Time permitting, do in-class problems.

4/10/17	Finish Unit 4B. Start lecture on Unit 5. Fundamental Concepts, Statistical Aspects, Sampling Plan Design, Sampling Plan Systems.
4/12/17	Continue Unit 5.
4/17/17	Continue Unit 5 lecture. Work some in-class example problems. Study Unit 6 - the Reliability section pp. 169-175.
4/19/17	Open for assignment presentations
4/24/17	Open for assignment presentations
4/26/17	Open for assignment presentations
5/01/17	Open for assignment presentations
5/03/17	Unit 6 – Reliability: Fundamental Aspects, Additional Statistical Aspects, Life and Reliability Testing Plans, Test Design, Availability and Maintainability.
5/08/17	Lecture on Unit 6 continued. In-class problems if time permits,
5/10/17	Finish Chapter 11
5/15/17	Catching up and review for the final exam – Last Day of Instruction
<b>FINAL EXAM</b>	<b>Final Examination: 7:15 AM – 9:30 - Monday, May 22, 2017.</b> Final is comprehensive and will include everything covered in the course.