

San José State University
College of Engineering, Department of Aviation & Technology
Tech 031, Quality Assurance and Control, Section 01, Fall, 18

Course and Contact Information

Instructor:	Fatemeh Davoudi, Ph.D.
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Office Hours:	Tu: 11:00AM-12:00 PM Th: 2:00 PM- 3:00 PM
Class Days/Time:	Mon: 9:00 AM- 10:15 AM Wed: 9:00 AM- 10:15 AM
Classroom:	ENG 405
Prerequisites:	BUS 90 or equivalent

Course Website and Textbook

This course will use SJSU Campus Canvas shell.

Textbook and Materials

- Required Textbook: Besterfield, D. (2012), Quality Improvement (9th Ed). Prentice Hall publisher.
- Scientific hand calculator
- Recommended: Laptop/notebook computer running a current version of R/Rstudio software (Detailed instruction on R/Rstudio download and full guide will be given in class.)

Other Readings & References (Optional)

- Mitra, A. (2016). Fundamentals of Quality Control and Improvement. John Wiley & Sons.
- Munro, Ramu, & Zrymiak (2015). The Certified Six Sigma Green Belt Handbook. ASQ Quality Press
- Kenett & Zacks (2014). Modern Industrial Statistics (2nd Ed). John Wiley & Sons.
- Henderson (2011). Six Sigma Quality Improvement. John Wiley & Sons.

Course Overview

Course Format

This course is a Lecture course, combining weekly lectures with written and online assignments and team activities to support the materials 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 Canvas Learning Management System course login website at <http://sjsu.instructure.com>. You are responsible for regularly checking with the messaging system through MySJSU at <http://my.sjsu.edu> (or other communication system as indicated by the instructor) to learn of any updates.

Course 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. Lecture 3 hours.

Course Objectives

The course will cover study of the application of descriptive measures, product sampling, organization of data, control charts, technical problem solving, quality testing, and quality control within business, technical and industrial applications. The purpose of the course is to help students apply, analyze, and evaluate industry-related information in order to conduct technical analyses and make informed decisions in the discipline.

The course objectives are directly tied to the mission statement of the University in providing high quality instruction and facilitating a need for applied knowledge and skills. The course covers selected topics in quality assurance and management including:

- Introduction to Quality Improvement
- Fundamentals of Statistics and probability
- Statistical Process Control and Control Charts
- Statistical Process Sampling Methods
- Hypothesis Testing and Experimental Designs

Students Learning Outcomes for Tech 031

Upon the completion of this course, you should have:

1. Gained a basic knowledge and appreciation of the fundamental principles of quality assurance and control in business, technical and industrial environments.
2. Gained appreciation of the principles and applications of data analysis and decision making in technological environments.
3. Improved your ability to identify, analyze, and solve quality-related technical problems in business and industrial settings to improve the productivity and quality of products.

Course Requirements and Assignments

“Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practice. Other course structures will have equivalent workload expectations as described in the syllabus.” More details about student workload can be found in [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) at <http://www.sjsu.edu/senate/docs/S16-9.pdf>.

Course Evaluation

<u>Course Grading</u>	<u>Points</u>	<u>Percent</u>	<u>Grading Scale (%) (tentative)</u>			
Exam 1	100	10%	A	>94	C	69-71.9
Exam 2	100	10%	A ⁻	90-93.9	C ⁻	65-68.9
Final Exam	200	20%	B ⁺	85-89.9	D ⁺	62-64.9
Written assignments (8 @ 25)	200	20%	B	80-84.9	D	59-61.9
Online assignments (10 @ 10)	100	10%	B ⁻	76-79.9	D ⁻	56-58.9
In class activities & team problems	300	30%	C ⁺	72-75.9	F	<55
Total	1000	100%				

Each category may be weighted to maintain the percentage distribution if the point totals do not match the above.

The instructor may, at their discretion, adjust the grading scale.

Written Assignments

There will be a written assignment, generally real-world case study problems for every new topic. Due date and time will be clearly specified for each assignment. Written assignments are to be completed in a **specified format** (see an example in the Resources folder in Canvas) and printed. They are **due at the beginning of class**. Multiple pages must be stapled together in the top left corner. Assignments **not properly typed, not in the specific format and not stapled will not be graded**. Late assignments will be accepted before an exam at a **penalty of 40%**. After an exam, assignments due before that exam **will not be accepted**. There will be a total of 8 to 10 written assignments. Only the 8 assignments with the highest grades are counted toward the total course grade. See *Modules/Resources/Standards for Written Assignments* on course Canvas for more information.

Online Assignments

Each week there will be assignments (online quizzes) **on Canvas** that are preparation for the written assignments and in-class activities. Due dates will be clearly specified for each assignment. There will be a total of 10 to 12 assignments. Only the 10 assignments with the highest grades are counted toward the total course grade. Late assignments will be accepted before an exam at a **penalty of 40%**. After an exam, assignments due before that exam **will not be accepted**.

In Class Activities & Team Problems

Students will do collaborative work in-class, a.k.a., “team problems” and other activities. Such activities are not announced before. You will be randomly assigned to teams throughout the semester for these activities. Team problems contribute up to 30% your final course evaluation. Your attendance is critical for the success of your team. As all team members work together toward solving the given problems, each member will be graded separately.

Exams

- There are 2 written exams, one approximately every five weeks. Examinations are closed-book and generally a mixture of problems and short answer questions. A one-page formula sheet is allowed for the exams.
- Exams are tentatively scheduled for: September 19 (Exam 1), and November 7 (Exam 2). Depending on what is happening in the class, the dates might change slightly.
- There is a comprehensive final examination in this course. A one-page formula sheet is allowed for the exams. Final exam is scheduled for Wednesday, December 12 during the Final Exams Week.

Course Policies

- **Attendance:** Your attendance (on-time and not disturbing the class) is expected for the duration of every class period. Consideration for making up missed work, including scheduled exams and unscheduled team problems, may be given if discussed with the instructor beforehand or if valid emergencies are involved.
- **Late assignments:** Late assignments will be accepted before an exam at a penalty of 40%. After an exam, assignments due before that exam will not be accepted.
- **Extra credit options:** There will be unscheduled extra credit pop quizzes and in-class questions that are counted as extra credit toward the total course grade.

- Your attendance is expected for the duration of every class period. Consideration for making up missed work, including scheduled exams and unscheduled team problems, may be given if discussed with the instructor beforehand or if valid emergencies are involved.
- **Cell phones** are not allowed as calculators for exams.
- Collaboration is allowed and encouraged for team problems and other assignments where specified. Otherwise, you are expected to work independently on assignments. Collaboration is defined as two or more students working together on a phase of an assignment. Note that “working together” does not mean that one student does the work and the other student just copies it.
- The use of computers is restricted to the tasks assigned in class. You are not supposed to use them for surfing the internet, etc.
- Visit <http://www.sjsu.edu/studentconduct/docs/Student%20Conduct%20Code%202016.pdf> for more information on Student Conduct Code.

Communication with Instructor

Follow the steps below to communicate with the instructor. You are expected to use appropriate online etiquette in your correspondence.

1. **Discussion Board:** Use the “Discussion Board” in Canvas to ask your question. Often, you are not the only one with the same question and/or other students can easily answer your question. The instructor will monitor the discussion board and respond within 24 hours, and usually much sooner to answer your question.
2. **Email:** Use the “Send Email” function in Canvas for items that are of a more personal nature (grades, time conflicts, late assignments, etc.). This will send an email to the instructor’s SJSU email addresses. You will get a response within 24 hours, and usually much sooner. Only emails sent from your official SJSU will be responded.
3. **Office hours:** The instructor endeavors to be strict about keeping scheduled office hours. If for some reason scheduled office hours change, an announcement will be posted in Canvas ahead.

Tips for Being Successful in Tech 031

1. **Come to class.** You cannot be successful in this course if you don’t come to class. I will not take attendance but there will be numerous unannounced graded activities in class that you will miss if you are not in attendance.
2. **Notify the instructor if you will miss class.** There are many reasons why students miss class, many of them valid. If you are going to miss class, inform me (either in person or by email) that you will not be in attendance and the reason for your absence. There are unannounced in-class activities that you will miss if you are not in attendance that, should you decide to make them up, will be assessed the 40% late penalty. And you will have to ask to make them up as the activities will not be otherwise available. Of course, I understand that emergencies do occur, and I try to make reasonable allowances for them.
3. **Communicate when you cannot meet deadlines.** You are expected to meet the deadlines for assignments. There is a late penalty that applies when you do not. If you cannot meet a deadline for a reasonable reason, I expect notification (in-person or email) ahead of time.
4. **Spend regular time on this class each week outside of the regularly scheduled class periods.** You should be regularly spending time on the class each week – at least one to two hours out of class for each hour of class. (That is three to six hours per week minimum outside of class.) Assignments will help you meet this expectation. Note that you cannot blow off the class throughout the semester and pull out a passing grade on the final.
5. **Ask questions!** If you do not understand what is been presented or discussed, ask! I want to hear your questions – my job is help you understand the course content but cannot if I do not know where the misunderstandings are. And if what we talk about sparks a question in your mind in another direction, ask. I will always respond to your questions. BTW, your knowledge is valuable too – we do not know everything (believe or not) and your contributions to the discussions are welcome. Use the discussion space in Canvas to ask/answer questions.
6. **Look at the assignments before the evening before the deadline.** There are deadlines for the assignments, clearly specified. A quick look ahead of time will give you insight into whether you have questions that can help you complete the assignment. Getting “stuck” an hour before an assignment is due doesn’t leave you many options to get “unstuck.” Also, I have noticed that student computers or Canvas amazingly seem to go haywire

just before deadlines (see #3 above). Submitting/finishing online assignments a bit before the deadlines gives you some breathing room for problems with the computer technology.

7. **Submitting late assignments is better than getting a zero for that assignment.** If you miss a deadline it is always worth something to hand in a late assignment, even with the late penalty.
8. **Take notes during the lecture.** Class notes are invaluable to learning the material in this class. I realize that many students today do not take notes, but from research studies on human learning, note taking can be an important tool to help your learning. I will post my lecture notes after class to assist you. I do not post them before class because: (a) I try not to avoid “death by PowerPoint,” so I may not have a student-friendly format beforehand; and (b) an individual class often diverges from what I had planned based on your questions and responses.
9. **Review notes, lectures, posted solutions and practice problems.** Going back to review and reflect on what you have heard, seen and done is how learning really occurs. (It is amazing to me how many students don’t bother to review the posted solutions.) This type of review is good preparation for exams.
10. **Do not expect computers to work perfectly.** While computer technology enables us to do wonderful things, something will probably not work correctly (Canvas, submitting assignments electronically, etc.) and at the most inopportune time. Please be patient. If something is wrong, is confusing or isn’t working with Canvas or other computer technology, let me know – we can work it out. I do not want to penalize you for things out of your control. My experience has been, however, that the majority of things are within your control. 😊

Tech 031-02 / Quality Assurance & Control, Fall 2018

Course Outline (Subject to change)

W	Date	Topics	Reading
1	08/22/18	<ul style="list-style-type: none"> ➤ Introductory Session • Course overview & Orientation • R & Rstudio Statistical Computing software ➤ Quality Improvement • Six Sigma & DMAIC ➤ Fundamentals of Statistics • Precision & Accuracy 	Ch. 1-3 Canvas Course Materials, Lecture Notes, etc.
2	08/27/18 & 08/29/18	<ul style="list-style-type: none"> ➤ Fundamentals of Statistics • Sample & Population • Descriptive Statistics • Chebyshev's rule 	Ch. 5 Canvas Course Materials, Lecture Notes, etc.
3	09/03/18 & 09/05/18	<ul style="list-style-type: none"> ➤ Labor Day- No class ➤ Fundamentals of Statistics • Measure of central Tendency • Drawing Statistical Conclusion 	Ch. 5 Canvas Course Materials, Lecture Notes, etc.
4	09/10/18 & 09/12/18	<ul style="list-style-type: none"> ➤ Statistical Process Control • Pareto Charts • Cause-Effect Diagrams 	Ch. 4 Canvas Course Materials, Lecture Notes, etc.
5	09/17/18 & 09/19/18	<ul style="list-style-type: none"> • Exam #1- In Class Review Session • Exam #1- Weeks (1-4) 	Exam #1 Materials Ch. 1,2,3,4,5 Canvas Course Materials, Lecture Notes, etc.
6	09/24/18 & 09/26/18	<ul style="list-style-type: none"> ➤ Fundamentals of Probability • Basic Concepts & Probability Distributions 	Ch. 8 Canvas Course Materials, Lecture Notes, etc.
7	10/01/18 & 10/03/18	<ul style="list-style-type: none"> ➤ Control Charts • Control Chart Methods • Process Capability • Nonconforming Units 	Ch. 6,9 Canvas Course Materials, Lecture Notes, etc.
8	10/08/18 & 10/10/18	<ul style="list-style-type: none"> ➤ Acceptance Sampling • Fundamental Concepts • Statistical Aspects 	Ch. 4,8,6,9 Canvas Course Materials, Lecture Notes, etc.
9	10/15/18 & 10/17/18	<ul style="list-style-type: none"> ➤ Acceptance Sampling • Sampling Plan Design • Sampling Plan Systems 	Ch. 10 Canvas Course Materials, Lecture Notes, etc.

W	Date	Topics	Reading
10	10/22/18 & 10/24/18	<ul style="list-style-type: none"> ➤ Experimental Design • t-test 	Ch. 13 Canvas Course Materials, Lecture Notes, etc.
11	10/29/18 & 11/31/18	<ul style="list-style-type: none"> ➤ Experimental Design • F-test 	Ch. 13 Canvas Course Materials, Lecture Notes, etc.
12	11/05/18 & 11/07/18	<ul style="list-style-type: none"> • Exam #2-Review • Exam #2- Weeks (6-11) 	Exam #2 Materials Ch. 10,13 Canvas Course Materials, Lecture Notes, etc.
13	11/12/18 & 11/14/18	<ul style="list-style-type: none"> ➤ Experimental Design • ANOVA 	Ch. 13 Canvas Course Materials, Lecture Notes, etc.
14	11/19/18 & 11/21/18	<ul style="list-style-type: none"> • Total Quality Management • Thanksgiving break- No School 	Ch. 13 Canvas Course Materials, Lecture Notes, etc.
15	11/26/18 & 11/28/18	<ul style="list-style-type: none"> • Total Quality Management 	Canvas Course Materials, Lecture Notes, etc. Ch. 13
16	12/03/18 & 12/05/18	<ul style="list-style-type: none"> • Total Quality Management 	Canvas Course Materials, Lecture Notes, etc. Ch. 13
17	12/10/18	<ul style="list-style-type: none"> • Final Exam- Review 	Final Exam Materials
Final Exam Wednesday, December 12, 7:15- 9:30 AM			

The instructor reserves the right to alter this tentative schedule as circumstances may dictate. Changes will be announced through Canvas.

University Policies

For details of all the policies and information, visit: <http://www.sjsu.edu/gup/syllabusinfo/>

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 arises. To learn important campus information, view University Policy S16-15 at <http://www.sjsu.edu/senate/docs/S16-15.pdf> and SJSU current semester's

Policies and Procedures at <http://info.sjsu.edu/static/schedules/policies.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 address the issue, it is recommended that the student contact the Department Chair as the next step.

Attendance and Participation

Attendance per se shall not be used as a criterion for grading. However, students are expected to attend all meetings for the courses in which they are enrolled as they are responsible for material discussed therein, and active participation is frequently essential to ensure maximum benefit to all class members. In some cases, attendance is fundamental to course objectives; for example, students may be required to interact with others in the class. Attendance is the responsibility of the student. Participation may be used as a criterion for grading when the parameters and their evaluation are clearly defined in the course syllabus and the percentage of the overall grade is stated. The full policy language can be found at <http://www.sjsu.edu/senate/docs/F15-3.pdf>

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage. Students should be aware of the current deadlines and penalties for dropping classes (Late Drop Information).

Information about the latest changes and news is available at the Advising Hub. See:

http://www.sjsu.edu/provost/academic_affairs/resources/academic_calendars/

<http://www.sjsu.edu/aars/policies/latedrops/policy/>

<http://www.sjsu.edu/advising/>

Disability Accommodation

San Jose State University is committed to providing an inclusive environment which is responsive to the needs of all students. To promote and ensure this inclusion, appropriate accommodations guaranteed by law are provided to individuals who have verified disabilities. 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. Students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at <http://www.sjsu.edu/aec/> to establish a record of their disability. Visit the policy at:

http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf.

Academic Integrity

The class will follow San Jose State University's policy on academic integrity. Anyone suspected of academic dishonesty will be reported. Note that SJSU identifies several forms of academic dishonesty including: A student uses or attempts to use unauthorized information in the taking of an exam; submits as his or her own work, themes, reports, drawings, laboratory notes, computer programs, or other products prepared by another person; or knowingly assists another student in such acts or plagiarism. Students found guilty of academic dishonesty in this class face suspension, conduct probation, or reprimand. You should review this policy. See

<http://www.sjsu.edu/studentconduct/docs/Academic%20Integrity%20Policy%20F15-7.pdf> and

<http://www.sjsu.edu/studentconduct/docs/Student%20Conduct%20Code%202013.pdf>.

Religious Accommodation

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. You should review this policy. See:

<http://www.sjsu.edu/senate/docs/S14-7.pdf>

Timely Feedback on Class Assignments

Per University Policy F13-1, <http://www.sjsu.edu/senate/docs/F13-1.pdf>, all students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades.

Student Technology Resources

Computer labs and other resources for student use are available in:

- Associated Students Print & Technology Center at <http://as.sjsu.edu/asptc/index.jsp> on the Student Union (East Wing 2nd floor Suite 2600)
- The Spartan Floor at the King Library at <http://library.sjsu.edu/about/spartan-floor>
- Student Computing Services at <http://library.sjsu.edu/student-computing-services/student-computing-services-center>
- Computers at the Martin Luther King Library for public at large at <https://www.sjpl.org/wireless>
- Additional computer labs may be available in your department/college
- A wide variety of audio-visual equipment is available for student checkout from Collaboration & Academic Technology Services located in IRC Building. 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.

Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, 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 green sheet 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.”

See the policy at: <http://www.sjsu.edu/senate/docs/S12-7.pdf>

SJSU Peer Connections

Peer Connections' free tutoring and mentoring is designed to assist students in the development of their full academic potential and to inspire them to become independent learners. Peer Connections tutors are trained to provide content-based tutoring in many lower division courses (some upper division) as well as writing and study skills assistance. Small group and individual tutoring are available. Peer Connections mentors are trained to provide support and resources in navigating the college experience. This support includes assistance in learning strategies and techniques on how to be a successful student. Peer Connections has a learning common, desktop computers, and success workshops on a wide variety of topics. For more information on services, hours, locations, or a list of current workshops, please visit Peer Connections website 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 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 and Psychological Services

The SJSU Counseling and Psychological Services is located on the corner of 7th Street and San Carlos in the new Student Wellness Center, Room 300B. Professional psychologists, social workers, and counselors are available to provide confidential 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 and Psychological Services website at <http://www.sjsu.edu/counseling/>.