CALIFORNIA STATE UNIVERSITY, CHICO

Department of Mechanical and Mechatronic Engineering and Advanced Manufacturing

Advanced Manufacturing and Applied Robotics - AMAR 451
Quality Management
Syllabus – Fall 2021

Instructor: Sinan Bank

Office location: Online

Telephone: 530-898-(4619)

E-mail: hsbank@mail.csuchico.edu

Office hours: Mon. 2-4 pm and Wed. 2-4 pm

Class days and times: Mo We Fr 9:00AM – 9:50AM

Classroom: Online

Course Materials: Not annotated slides of the class in a folder and the reference book.

Course Usage of Blackboard Learn

Copies of the course syllabus and major assignments may be found on Blackboard Learn. You are responsible for regularly checking the online resources, which is accessed through the Chico State Portal at http://portal.csuchico.edu. Support materials for the course will be provided via the portal and it is expected that you will either have hardcopies or electronic access to the materials during in-class activities.

Course Description and Goals

This course introduces students to the concepts, tools, and techniques used in Quality Management, quality cultures, effective team structures, measurement of quality, productivity, and competitiveness in a business and industrial environment. The course not only introduces students to the concepts of quality assurance and quality control, but also connects leadership, supplier-customer relationships, employee engagement, data collection and analysis, productivity, statistical process control, and other topics to quality and customer satisfaction. The students will gain experience in decision-making and basic diagnostic techniques and technologies related to quality.

Course Objectives

1. Enable students to understand the importance of quality in modern business scenarios to individuals, organizations, customers, suppliers, and society.
2. Identify and describe the key components and challenges of Total Quality Management (TQM) and understand how organizations approach TQM development.
3. Acknowledge the role of attitudes, beliefs, behaviors, and ethics on quality.
4. Differentiate between internal and external customers and discern perceptions of quality and the effect on customer relations.

5. Differentiate between quality assurance and quality control.
6. Distinguish different quality improvement strategies such as TQM, ISO implementation of Lean Principles.
7. Familiarize the students with effectiveness and efficiency principles as related to quality, productivity, and supply chain management.
8. Demonstrate the value of understanding effective communication and behavioral styles.
9. Demonstrate problem solving with the use of quality tools.

Student Learning Outcomes

Upon successful completion of this course students will be able to

1. Define quality and discuss obstacles of quality management
2. Recognize the Principles of Total Quality Management
3. Recognize the role of attitudes, beliefs, behaviors, and ethics in what we know and what we do.
4. Differentiate between internal and external customers and the impact of perceptions on the organization.
5. Utilize communication effectively with customers and co-workers to bolster positive and productive relationships.
6. Comprehend the impact of engagement and motivation on quality.
7. Define quality assurance and quality control and describe the consequences of poor quality management.
8. Explain error tolerances and rationalize the impact of over-control and under-control and standard operating procedures
9. Discuss key elements of quality improvement strategies using PDCA and Lean tools.
10. Interpret and understand inspection requirements, certificates of compliance, and other means of quality verification.
11. Understand the purpose and fundamentals of the auditing process and comprehend traceability and chain of custody advantages and disadvantages.
12. Recognize the impact of documentation, reporting, inspecting, and auditing in product liability and costs to the individual and company.
13. Develop and use common charting methods for problem solving and data collection.

Required Texts and Reading

Lecture:	*Goetsch, David L., and Stanley B. Davis. Quality management for organizational excellence., 9th Edition, Upper Saddle River, NJ: Pearson, 2021.* *Groover, M. P. "Automation, Production Systems, and Computer‐integrated Manufacturing 5th ed." Assembly Automation (2019).*

Attendance

Because true learning occurs only when the learner is an active participant in the learning process, your active participation in this class is essential and expected. You will receive participation points as the details depicted in the later sections. Missing any lecture or lab session will be detrimental to your success and ultimately your grade in this course. You will be required to stay for the entire duration of each lecture and lab session unless dismissed by the instructor.

Submission of the Assignments

- All of the exams will be online (most probably from Friday evening until Sunday midnight), and the students will have 48 hours+ to upload their solutions to provide Google Form. Late uploads of the exams will **NOT** be accepted.

- Please be aware that you **MUST** use your student email address (student_email_id@mail.csuchico.edu) and make sure that you logged out from other Gmail addresses while using the resources from Google Drive.

- You will also receive an email regarding a shared folder Fall_2021_AMAR_451_student_email_id where I will share with you any documents (e.g., exam or HW results). You need to use the name of the folder with the suffix of the assignment dedicated to you to upload your work.

Email

In the event I need to contact members of the class or make urgent announcements regarding tests, class cancellations, etc., it will be done via your WildcatMail email account. I do not plan to use this method of communication frequently, but I do expect that information sent this way will be received. University policy requires students to monitor their WildcatMail accounts. If you have another preferred email provider, you may set up automatic forwarding of your WildcatMail to that address. Details are available at www.csuchico.edu/itss/.

Late Assignments

Late assignments will be accepted with penalty. If any quizzes are missed, they may not be taken later without a doctor's excuse.

Attendance

Because true learning occurs only when the learner is an active participant in the learning process, your active participation in this class is essential and expected. You will be required to stay for the entire duration of each lecture and/or lab session unless dismissed by the instructor. Missing any lecture or lab session will be detrimental to your success and ultimately your grade in this course. Every class meeting will provide opportunities for both lecture and demonstration material to be received. Do not expect the instructor to provide special make-up demonstrations of missed material. However, for online classes, the instructor may share the video of the lecture for the students.

Cleanup

There will be students in the labs at various times who are Lab Monitors and/or Teaching Assistants. Part of their duties are to make sure that all students are wearing safety glasses, closed-toed shoes and any other Personal Protective Equipment (PPE) that is required for specific lab activities. They have the authority to tell students who are not following safety procedures to leave the lab immediately. They also have the authority to enforce proper cleanup procedures by all students.

Lab Monitors and Teaching Assistants

There will be students in the labs at various times who are Lab Monitors and/or Teaching Assistants. Part of their duties are to make sure that all students are wearing safety glasses, closed-toed shoes and any other Personal Protective Equipment (PPE) that is required for specific lab activities. They have the authority to tell students who are not following safety procedures to leave the lab immediately. They also have the authority to enforce proper cleanup procedures by all students.

Safety

Everyone in Plumas 114, 116 and 121 must wear eye protection and closed-toed shoes at all times except in the areas of Plumas 114 between the entrance door and yellow/black limit lines on the floor. Anyone failing to comply with all lab safety rules will be told to leave the lab immediately and not be allowed to return to the lab that day. Repeated offenses will result in failing the course. No student may work in these labs without first passing the safety quiz (60%) and signing an Acknowledgement of Lab Safety Policies and Procedures.

COVID 19 - Face Mask Requirements

In compliance with the California Department of Public Health state mandate, Chico State requires that all students, staff, and faculty, wear a face covering in all indoor spaces on campus, including classrooms, labs, studios, and offices, and outside when physical distancing is not possible. Accordingly, all students are required to wear a face mask covering the nose and mouth in order to participate in this course. Failure to comply with this requirement will result in a referral to Student Conduct, Rights, and Responsibilities and disciplinary action being taken against you by the University.

Individuals unable to wear a face covering due to a medical condition should contact the Accessibility Resource Center by phone at (530) 898-5959 or by email at arcdept@csuchico.edu.

For more information about the state mandate, please visit the Chico State COVID-19 News & Information page.

Dropping and Adding
You are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. found http://www.csuchico.edu/catalog/. You should be aware of the new deadlines and penalties for adding and dropping classes.

Academic Integrity
By their nature, computer based assignments lend themselves to easy copying and sharing. Any sharing of electronic data constitutes a violation of the university's academic integrity policy and will not be tolerated. Violations will be referred to student judicial affairs and can result in penalties ranging from failure of the course to long term suspension from the university. See the Academic Integrity document for additional information.

Evaluation Procedures

Graded Task	***Percent of Final Grade***
Participation Credit **	10 %
Assignments and Project Paper	20%
Quizzes	20 %
Take Home Exams	20%
Final Exam	30 %
	Total: 100%

Note:
1. These are subject to change with a fair notification.
2. Late homework will be accepted with additional penalties.

Participation Credit **:
The participation credit relates to the following pointers:
- The constructive (+ point) or non-constructive (- points) behavior in the class to improve the learning outcome of everyone,
- The addressed relevant questions during the class,
- Your answers to the questions during the class session,
- The outcome of in-class quizzes,
- Outstanding final project delivery which positively affects the future semesters of the class,
As many points as you check in the list above, you will guarantee higher points.

Sample Rubric for Assignments and Final Project

Report Rubric

	Expert			Proficient			Apprentice			Novice		
	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-
Technical Content (Equations, Numerical Usage, and Illustrations)	• All equations are clear, accurate, and labeled. All variables are defined and units specified. Discussion regarding the equation development and use has been stated. • All figures, graphs, charts, and drawings are accurate, consistent with the text, and of good quality. They enhance understanding of the text. • All items are labeled in accordance with engineering standards and are referred to in the text.			• Most equations are accurate and clear. Most variables are defined and units specified. With some minor exceptions, adequate discussion regarding the equation development and usage has been stated. • For the most part, illustrations are accurate, consistent with the text, and of good quality. • All items are generally labeled in accordance with engineering standards and are referred to in the text.			• Most equations are accurate. Too many variables are not defined. Discussion regarding the development and usage of the equation is unclear. • In some cases, illustrations are not conveying information clearly. • While items are labeled, references to these items are missing.			• There may be inaccuracies within the equation. Little or no attempt is made to make it easy for the reader to understand the use of an equation or its derivation. • Figures, graphs, charts, and drawings are of poor quality, have numerous inaccuracies and mislabeling, or may be missing. • There is no corresponding explanatory text for included items.		
Visual Format and Organization	• The document is visually appealing and easily navigated. • Appropriate typography and usage of white space are used as appropriate to separate blocks of text and add emphasis.			• The document is organized. • Use of white space and typography help the reader navigate the document, although the layout could be more effective.			• Errors in the Table of Contents are present. • Within sections, the order in which ideas are presented is occasionally confusing.			• The document is not visually appealing and there are few "cues" to help the reader navigate the document. • There is no apparent ordering of paragraphs, and thus there is no progressive flow of ideas.		
Language (Word Choice, Grammar)	• Sentences are complete and grammatical. They flow together easily. • Words are chosen for their precise meaning. • Engineering terms and jargon are used correctly. • No misspelled words are present.			• For the most part, sentences are complete and grammatical, and they flow together easily. Any errors are minor and do not distract the reader. • Repetition of words and phrases is mostly avoided. • For the most part, terms and jargon are used correctly with some attempt to define them. • There are one or two misspelled words.			• In a few places, errors in sentence structure and grammar distract the reader and interfere with meaning. • Word choice could be improved. • Occasionally, technical jargon is used without definition. • There are a few misspelled words.			• Errors in sentence structure and grammar frequently distract the reader and interfere with meaning. • There is unnecessary repetition of the same words and phrases. • There is an overuse of jargon and technical terms without definition. • There are many misspelled words.		
Use of appendices	• Information is placed appropriately in either the main text or an appendix. • Appendices are documented and referenced in the text.			• Appendices are used when appropriate. • Selection and/or extent of material in appendix may not be optimal.			• While appendices are present, material in appendix is not referred to properly in text. • Content in appendix is not complete.			• Appendices were not utilized when appropriate. • There is unnecessary inclusion of detailed information in the main body of the text.		

Online Education

Online education requires skills and habits that may be less essential in traditional courses. In order to be successful in your online course you will need:

- **Space:** Establish a comfortable and well-organized physical workspace.
- **Time Management Skills:** Set personal study and "classroom" time as you would do for a traditional course.
- **Organization Skills:** Print out all class material (modules, PowerPoints, assignments, additional resources, and any work you generate) and keep everything in a single location (binder). Maintain electronic backups of all class material in a structured way.
- **Communication Skills:** Demonstrate a willingness to interact with your instructor and classmates through email, phone calls, discussion boards, and active participation in all class activities.
- **Initiative:** Review information on Blackboard.
- **Discipline:** Pace yourself, complete all activities and assignments before the due date, follow through on all class requirements to completion.
- **Technology Support:** Making sure that you have an appropriate hardware (suggested computer and monitor size, not following the class from the cell phone screen) and software setup.

The more closely you adhere to the recommendations above the greater your chances of having a successful semester and a rewarding online experience.

University Policies and Campus Resources

Academic integrity

Students are expected to be familiar with the University's Academic Integrity Policy. Your own commitment to learning, as evidenced by your enrollment at California State University, Chico, 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 Student Judicial Affairs. The policy on academic integrity and other resources related to student conduct can be found at: http://www.csuchico.edu/sjd/integrity.shtml.

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 me as soon as possible, or see me during office hours. Students with disabilities requesting accommodations must register with the DSS Office (Disability Support Services) to establish a record of their disability.

Special accommodations for exams require ample notice to the testing office and must be submitted to the instructor well in advance of the exam date.

IT Support Services

Computer labs for student use are located on the first and fourth floor of the Meriam Library, Room 116 and 450, Tehama Hall Room 131, and the Bell Memorial Union (BMU) basement. You can get help using your computer from IT Support Services; contact them through their website, http://www.csuchico.edu/itss. Additional labs may be available to students in your department or college.

Student Services

Student services are designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. Students can find support for services such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. Student services information can be found at: http://www.csuchico.edu/current-students.

Americans with Disabilities Act

If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make 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. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with

Disabilities Act and provide you further assistance with requesting and arranging accommodations.

Accessibility Resource Center
http://www.csuchico.edu/arc
530-898-5959
Student Services Center 170
arcdept@csuchico.edu

Student Learning Center
The mission of the Student Learning Center (SLC) is to provide services that will assist CSU, Chico students to become independent learners. The SLC prepares and supports students in their college course work by offering a variety of programs and resources to meet student needs. The SLC facilitates the academic transition and retention of students from high schools and community colleges by providing study strategy information, content subject tutoring, and supplemental instruction. The SLC is online at http://www.csuchico.edu/slc. The University Writing Center has been combined with the Student Learning Center.

Course Content and Topical Outline:

Philosophy and Concepts
Chapter 1: Total Quality Approach to Quality Management: Achieving Organization
Chapter 2: Quality and Global Competitiveness
Chapter 3: Strategic Management: Planning and Execution for Competitive Advantage
Chapter 5: Partnering and Strategic Alliances
Chapter 6: Quality Culture Changing Hearts, Minds, and Attitudes **(*)**
Chapter 7: Customer Satisfaction, Retention, and Loyalty
Chapter 8: Employee Empowerment
Chapter 9: Leadership and Change
Chapter 10: Team Building and Teamwork
Chapter 11: Effective Communication **(*)**
Chapter 12: Education and Training **(*)**
Chapter 13: Overcoming Politics, Negativity, and Conflict in the Workplace **(*)**
Chapter 14: ISO 9000 and Total Quality

Tools and Techniques
Chapter 15: Overview of Total Quality Tools
Chapter 16: Problem Solving and Decision Making
Chapter 17: Quality Function Deployment
Chapter 18: Optimizing and Controlling Processes Through Statistical Process Control
Chapter 19: Improvement Methods with Six Sigma, Lean, Lean Six Sigma, and More

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Technologies
Chapter 21: Inspection Principles and Practices **(*)**
Chapter 22: Inspection Technologies **(*)**

(*) These chapters might be deduced from the main content and the tentative schedule depending on our pace.

AMAR 451 - Quality Management

Course Schedule, Fall 2021 (Tentative subject to our pace)

WEEK	DATE	PLANNED TOPICS	READING	WORK DUE
1	Aug. 23 / Aug. 27	Introduction to the class and logistics Chapter 1: Total Quality Approach to Quality Management: Achieving Organization Chapter 2: Quality and Global Competitiveness	Slide deck and Ch 1 & 2 from Goetsch	N/A
2	Aug. 30 / Sep. 3	Chapter 3: Strategic Management: Planning and Execution for Competitive Advantage Chapter 5: Partnering and Strategic Alliances	Slide deck and Ch 3 & Ch 5 from Goetsch	See Assignment and Project Sheet Assignment 1
3	Sep. 7 / Sep. 10	Chapter 6: Quality Culture Changing Hearts, Minds, and Attitudes (*) Chapter 7: Customer Satisfaction, Retention, and Loyalty	Slide deck and Ch 6 & Ch 7 from Goetsch	
4	Sep. 13 / Sep. 17	Chapter 8: Employee Empowerment Chapter 9: Leadership and Change	Slide deck and Ch 8 & Ch 9 from Goetsch	See Assignment and Project Sheet Assignment 2
	Sep. 17 / 19	**Exam 1 (Take Home)**	Week 1-4	Sep. 19 11:59 pm
5	Sep. 20 / Sep. 24	Chapter 10: Team Building and Teamwork Chapter 11: Effective Communication (*)	Slide deck and Ch 10 & Ch 11 from Goetsch	
6	Sep. 27 / Oct. 1	Chapter 12: Education and Training (*) Chapter 13: Overcoming Politics, Negativity, and Conflict in the Workplace (*)	Slide deck and Ch 12 & Ch 13 from Goetsch	See Assignment and Project Sheet Assignment 3
7	Oct. 4 / Oct. 8	Chapter 14: ISO 9000 and Total Quality Chapter 15: Overview of Total Quality Tools	Slide deck and Ch 14 & Ch 15 from Goetsch	
8	Oct. 11 / Oct. 15	Chapter 16: Problem Solving and Decision Making	Slide deck and Ch 16	See Assignment and Project Sheet Assignment4
	Oct. 15 / 17	**Exam 2 (Take Home)**	Week 5-8	Oct. 17 11:59 pm
9	Oct. 18 / Oct. 22	Chapter 17: Quality Function Deployment	Slide deck and Ch 17	
10	Oct. 25 / Oct. 29	Chapter 17: Quality Function Deployment	Slide deck and Ch 17	See Assignment and Project Sheet Assignment 5
11	Oct. 31 / Nov. 4	Chapter 18: Optimizing and Controlling Processes Through Statistical Process Control	Slide deck and Ch 18	
12	Nov. 8 / Nov. 12	Chapter 18: Optimizing and Controlling Processes Through Statistical Process Control	Slide deck and Ch 18	See Assignment and Project Sheet Assignment 6
13	Nov. 15 / Nov. 19	Chapter 19: Improvement Methods with Six Sigma, Lean, Lean Six Sigma, and More	Slide deck and Ch 19	
	Nov. 19/ 21	**Exam 3 (Take Home)**	Week 9-13	Nov. 21 11:59 pm
Winter Break (Nov 22 - Nov. 26)				
15	Nov. 29 / Dec. 3	Chapter 21: Inspection Principles and Practices (*)	Slide deck and Ch 21 from	See Assignment and Project Sheet

			Groover	Assignment 7 (EC)
16	Dec. 6/ Dec. 10	Chapter 22: Inspection Technologies **(*)**	Slide deck and Ch 22 from Groover	

(*) These chapters might be deduced from the main content and the tentative schedule depending on our pace.
(EC : Extra Credit)