Principles of Quality (PTAC 2314)

Credit: 3 semester credit hours (3 hours lectures)

Prerequisite: MATH 1332, PTAC 1302

Course Description

This course is the study of the background and application of quality concepts. Topics include team skills, quality tools, statistics, economics and continuous improvement.

Required Textbooks and Materials

1. Quality Concepts for the Process Industry (ISBN: 978-1435482449)

Course Objectives

Upon completion of this course, the student will be able to:

1. Identify why quality is important, how it all began and the key contributers to the movement of quality.
2. Describe the principles of quality control.
3. Demonstrate team skills
4. Identify the economics of quality, the components of a quality system and the cost associated with quality.
5. Apply principles and tools of quality to process systems.
6. Use statistical process controls to collect, organize, and analyze data.

Course Outline

A. Why Quality is Important
   a. Quality as a Competitive Tool
   b. Quality Systems
   c. The Quality Marathon
   d. Defining Quality
   e. The Way We Must Think

B. How It All Began
   a. Defining Quality
   b. The Business Need for Quality
   c. The First Heralds of Quality
   d. Sarasohn's Systems Approach
   e. Quantity Versus Quality
   f. Modern Industrial Production
   g. American Enters the Unending Marathon

C. The Quality Gurus
   a. W. Edwards Deming (1900-1993)
   b. Joseph M. Juran (1904-2008)
   c. Philip B Crosby (1926-2001)
   d. The Japanese Gurus
   e. Kaoru Ishikawa (1915-1989)
   f. Genichi Taguchi (1924-)
   g. Scenario
   h. Two Infants Die After Getting Adult Doses

D. The International Standards Organization
   a. Products and Service Organization
   b. How ISO Began
   c. Standardization and Benefits
   d. American Embraces ISO

e. Applying for an ISO Standard
f. Maintaining ISO Registration
g. From ISO 9000 to ISO 2000
h. ISO 14000

E. Total Quality Management
a. Total Quality Management
b. Barriers to TQM
c. Initiating TQM
d. TQM for Profit
e. Acceptable Quality Levels
f. Performance Levels
g. Quality Awards

F. Customer Satisfaction
a. The Customer
b. What is a Customer
c. Dissatisfied Customers
d. Maintaining Customer Satisfaction
e. Beyond Customer Satisfaction
f. Company Growth and Customer Satisfaction

G. Employee Empowerment
a. Employee Empowerment
b. Employee Development
c. Involvement and Empowerment
d. Motivation for Empowerment
e. Attitude and Behavior

H. Teamwork and Teams
a. The Business Need for Teams
b. Developing the Team
c. Diversity
d. Becoming a Team Member
e. Teams for Continuous Improvement
f. Team Dynamics

I. Communication
a. Communication
b. Methods of Communication
c. How to Ask Questions
d. Body Language and Gestures
e. Barriers to Effective Communication

J. Personal Effectiveness
a. Employee Responsibilities
b. Motivation
c. Leadership
d. Organizational Aspects of the Human Relations System

K. The Economics of Quality
a. What is Economics
b. The Marketplace Economy
c. Supply, Demand, and Prices
d. Competition
e. Innovation
f. Productivity
g. Industrial Economics and Cost Reduction
h. The Global Marketplace
i. Global Competition

L. Quality as a System
a. Systems and Subsystems
b. The Process Unit as a System
c. Customers and Suppliers of the System
d. Requirements (the What Questions)
e. Quality as a System

M. The Cost of Quality
a. Work
b. The War on Waste
c. The Cost of Quality (COQ)
d. The Measurement of Quality

N. Quality Tools (Part 1)
a. Beginning Quality Improvement
b. The Scientific Approach
c. The Purpose of Quality Tools
d. Brainstorming
e. Check Sheets
f. Run Charts
g. Scatter Diagrams
h. Process Flowcharts

O. Quality Tools (Part 2)
a. Pie Charts
b. Cause-and-Effect Diagrams (Fish Bone Diagrams)
c. Histograms
d. Pareto Charts

e. Control Charts

P. Variation
   a. Variation in Processes
   b. Process Variation as a Tool
   c. Variation and Achieving Statistical Control
   d. Shewhart and Deming on Variation
   e. The Necessity of Control Charts

Q. Statistical Process Control
   a. The United States and the Beginning of Statistical Process Control
   b. Histograms (Revisited)
   c. The Normal Distribution

R. SPC and Control Charts
   a. SPC and Control Charts
   b. Statistics for SPC
   c. Basic X bar and R Control Charts
   d. Interpreting Control Charts
   e. Test for Lack of Control

S. Process Capability
   a. The Scientific Foundation of a Process Capability Study
   b. Problems solved by Process Capability Studies

T. Epilogue
   a. The Advantages of Quality

Grade Scale

90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

Course Evaluation

Final grades will be calculated according to the following criteria;

Assignments	10%
Exams (6)	50%
Final	40%

Course Requirements

1. Assignments
2. Discussions
3. Take 6 Tests
4. Take Comprehensive Final Exam

Course Policies

1. No cheating of any kind will be tolerated. Students caught cheating or helping someone to cheat can and will be removed from the class for the semester. Cheating can result in expulsion from LIT.
2. If you wish to drop a course, the student is responsible for initiating and dropping the course. If you stop logging-in to the course and do not complete the course drop process, then you will receive an "F" grade for the course
3. Internet Usage – Students are expected to use proper net etiquette while participating in course emails, assignment submissions, and online discussions.
4. Assignments submitted more than a week late will be reduced 25%.

5. If a test is missed due to an emergency situation, the student will have one week to make it up; otherwise a grade of 0 will be assigned.
6. A student who wishes to drop a course is responsible for initiating and completing the drop process. A student who stops coming to class, and fails to drop the course, will earn an "F" in the course.

Attendance Policy

1. Missing more than 20% of classes will result in an automatic "F" for the course.
2. Absences are counted for unexcused, excused and coming to class late.
3. Missing more than 20% of a class period will count as an absence.
4. Being tardy 2 times equals 1 absence.

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the LIT Catalog and Student Handbook. The LIT Catalog and Student Handbook may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office.

Disabilities Statement

The American with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

Course Schedule

Week	Topic	Reference
1, 2	Course introduction and policies Why Quality is Important How It All Began The Quality Gurus	Chapter 1 Chapter 2 Chapter 3 Discussion 1
3	Test 1 Chap. 1-3 The International Standards Organization	 Chapter 4
4	Total Quality Management Customer Satisfaction	Chapter 5 Chapter 6 Assignment 1 Discussion 2

5	Test 2 Chap. 4-6 Employee Empowerment	 Chapter 7
6	Teamwork and Teams	Chapter 8
7	Communication	Chapter 9 Discussion 3
8	Test 3 Chap. 7-9 Personal Effectiveness	 Chapter 10
9	The Economics of Quality	Chapter 11 Discussion 4
10	Quality as a System	Chapter 12
11	Test 4 Chap. 10-12 The Cost of Quality	 Chapter 13 Assignment 2
12	Quality Tools (part 1) Quality Tools (part 2)	Chapter 14 Chapter 15 Discussion 5
13	Test 5 Chap 13-15 Variation	Chapter 16 Assignment 3
14	Statistical Process Control SPC and Control Charts Process Capability	Chapter 17 Chapter 18 Chapter 19 Discussion 6 Assignment 4
15	Test 6 Chap.16-20	
16	Final Exam Chap.1-20	