Course Objective
The objective of this course is to provide students with concepts and tools utilized by a quality engineer. Major topics that will be covered include strategic planning and strategy deployment, management and planning tools, supplier certification and management, quality management systems, measurement system analysis, quality function deployment, continuous improvement, and quantitative methods and tools. A significant portion of the course material will encompass the ASQ Certified Quality Engineer body of knowledge.

References

Course Format
This course will primarily be conducted in the form of lectures to introduce content, weekly discussions, case studies, and individual and team activities.

Quizzes
As part of each learning module, a 10-point quiz will be administered to test your knowledge of the content presented in that module.

Exams
Three exams will be administered throughout the duration of the course and will covering the following material:
- Exam 1: Lessons 1-6
- Exam 2: Lessons 7-11
- Exam 3: Lessons 12-14

Software Utilized
- Microsoft Excel® for Statistical Analysis
Grading Policy

- Assignments - 20%
- Exam 1 – 20%
- Exam 2 – 20%
- Exam 3 – 20%
- Baldrige Case Studies - 15%
- Discussions – 5%

Grading Assignments:

A: 90 - 100%
B: 80 - 89%
C: 70 - 79%
D: 60 – 69%

Lessons

1. Strategic Planning
2. Strategy Deployment
3. The Seven Management and Planning Tools
4. Supplier Management
5. Supplier Certification
6. Quality Management System Overview
7. Acceptance Sampling Introduction
8. Single Sampling Plans
9. Sampling Systems
10. Measurement System Analysis
11. Process Capability
12. Quality Function Deployment
13. Regression Analysis
14. Time Series Analysis

Expected Student Outcomes

At the end of the course, the student should be able to:

1. Identify the steps in strategy formulation begin with determining the organization’s mission, vision, and guiding principles. These lead to strategies, strategic objectives, and action plans that set the direction for achieving the mission.
2. Explain that deploying strategy effectively is often done through a process called hoshin kanri, or policy deployment, that emphasizes organization-wide planning and setting of priorities, providing resources to meet objectives, and measuring performance as a basis for improving it and is essentially a total quality approach to executing strategy.
3. Explain how the seven management and planning tools can help managers to implement policy deployment and are useful in other areas of quality planning, and to apply the tool in a given situation.
4. Summarize elements in a supply chain and current trends in effective supply chain management.
5. Explain the concept of supplier certification and the general criteria used to evaluate and certify suppliers.
6. Define, describe, and interpret the basic elements of a quality system, including planning, control, and improvement, from product and process design through quality cost systems and audit programs.
7. Describe key points of the ISO 9000 series of standards and how they are used.
• Summarize the role of acceptance-sampling in modern quality control systems. Identify and distinguish between single, double, multiple, sequential, and continuous sampling methods.
• Define, describe, and apply the concepts of producer and consumer risk and related terms in single sampling plans, including operating characteristic (OC) curves, acceptable quality limit (AQL), lot tolerance percent defective (LTPD), average outgoing quality (AOQ), and average outgoing quality limit (AOQL).
• Interpret and apply ANSI/ASQ Z1.4 standards and Dodge-Romig sampling tables for attributes sampling.
• Identify, describe, and apply metrology techniques such as calibration systems, traceability to calibration standards, measurement error and its sources, and control and maintenance of measurement standards and devices.
• Calculate, analyze, and interpret repeatability and reproducibility (Gage R&R) studies, measurement correlation, capability, bias, linearity, etc., including both conventional and control chart methods
• Define, apply, and analyze the results of customer relation measures such as quality function deployment (QFD) and customer satisfaction surveys. Utilize competitive benchmarking to develop strategies for marketing and design.
• Distinguish between natural process limits and specification limits, and calculate percent defective.
• Define, select, and calculate Cp, Cpk, Cpm, and Cr, and evaluate process capability.
• Define, select, and calculate Pp and Ppk and evaluate process performance.
• Calculate the regression equation for simple regressions and least squares estimates. Construct and interpret hypothesis tests for regression statistics. Use regression models for estimation and prediction, and analyze the uncertainty in the estimate.
• Define, describe, and use time-series analysis including moving average, and interpret time-series graphs to identify trends and seasonal or cyclical variation.

Emergency Procedures
Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering with the facility.