Department of Mechanical Engineering Technology

Course number/name:

MECH 3501 Quality Control

Credits/contact hours:

3 course credits, 2 class hours, 2 lab hours

Instructor/coordinator:

Angran Xiao, Assistant Professor of Mechanical Engineering Technology

Text book/title/author/year

Dale H. Besterfield, Quality Control, 8th Ed., Prentice Hall, 2009, ISBN-10: 0135000955

Specific course information

Catalog description:

This course presents the fundamental coverage of product quality control. Focused on data acquisition and analysis using quantitative techniques related to the management of quality assurance systems and quality improvement programs. Topics include process capability, control charts, acceptance sampling, quality engineering and quality design.

Pre/Corequisites:

MAT 1475, MECH 1240, MECH 2333

Required/elective/selected elective:

Required for Mechanical Engineering Technology and Industrial Design Technology

Course learning objectives:

1. Understand quality, quality control, and total quality management. Know the quality functions served by the computer.
2. Know the basic concepts and benefits of TQM. Know the continuous process improvement and the problem-solving method. Know the importance of supplier partnership and techniques to measure effectiveness. Understand basic TQM tools and techniques.
3. Understand the concept of the control chart. Know how to select the quality characteristics, the rational subgroup, and the method of taking samples. Understand process capability, different types of control charts and the reasons for their use.
4. Know the limitations of control charts and the different types of attribute charts.
5. Know the advantages and disadvantages of sampling; the types of sampling plans and selection factors; criteria for formation of lots; criteria for sample selection; and decisions concerning rejected lots. Understand ANSI/ASQ Z1.4.
6. Know the definition of reliability and the factors associated with it. Know the various techniques to obtain reliability. Understand the different types of test design.

Course addresses ABET student outcomes: SO1, SO4

Brief list of topics to be covered:

Quality Definition, Responsibility for Quality, Quality Control, Total Quality Management History and Principles

Total Quality Management Principles and Techniques. ISO9000. Process Control, Management and Planning Tools, Expected Value in Decision Making

Tolerances in Design, Manufacturing, and Testing. Design for Desired Quality.

Importance of Control Charts and their use. State of Control, Specifications, Process Capability, Other Control Charts

Control Charts for Attributes, Control Charts For Nonconforming Units/Count of Nonconformities, Quality Rating System

ANSI/ASQ Z1.4 and its Application in Manufacturing