South Central College

MTT 2230 Quality Assurance III

Course Outcome Summary

Course Information

Description
This course is a continuation of Quality Assurance II. New topics include more alternative measuring techniques and final inspection of advanced project. (Prerequisites: MTT 2130)

Total Credits 2
Total Hours 48

Types of Instruction

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Pre/Corequisites

MTT 2130

Institutional Core Competencies

Communication - Students will be able to demonstrate appropriate and effective interactions with others to achieve their personal, academic, and professional objectives.

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Incorporate Geometric Dimensioning and Tolerancing (GD&T)

   Learning Objectives
   Explain the general overview, geometric characteristic symbols, rules, terms and definitions
   Describe measurement principles, open set-up and Coordinate Measuring Machine (CMM)
   Use Coordinate Measuring Machine (CMM)

2. Explain limits of size

   Learning Objectives
   Describe Rule #1
   Identify features with & without size
   Explain limits & fits
3. **Describe position tolerancing and verification**
   Learning Objectives
   - Describe plus/minus tolerances
   - Interpret datum reference frames
   - Explain datum precedence
   - Identify basic dimensions
   - Explain maximum material condition (MMC), least material condition (LMC), reference feature size (RFS) feature modifiers
   - Describe profile tolerancing

4. **Verify product plans and virtual condition**
   Learning Objectives
   - Create a definition drawing, manufacturing process plan, dimensional measurement plan
   - Describe boundaries
   - Explain calculating virtual size
   - Use perpendicularity as a refinement of position

5. **Describe the datum reference frame**
   Learning Objectives
   - Describe datums, datum features, datum feature simulators
   - Describe holes, slots, shafts, tabs, widths as datum features
   - Explain datum feature precedence
   - Identify the constraining degrees of freedom
   - Describe datum feature simulator requirements
   - Describe partial datum features

6. **Explain form tolerances**
   Learning Objectives
   - Identify flatness, straightness
   - Identify circularity, cylindricity

7. **Explain orientation tolerances**
   Learning Objectives
   - Identify perpendicularity, parallelism, angularity
   - Explain orientation as a refinement of location

8. **Identify advanced profile tolerances**
   Learning Objectives
   - Explain profile of a surface and line
   - Use profile to control size, form, orientation and location
   - Describe bilateral and unilateral tolerances
   - Explain application and verification principles
   - Explain profile measurement data reporting
   - Describe free state and restrained condition

9. **Describe coaxial and runout tolerances**
   Learning Objectives
   - Create datum features with a single datum axis (A-B)
   - Use position to control coaxiality
   - Describe circular runout and total runout
   - Describe concentricity and symmetry
   - Use profile to control coaxiality

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