Common Course Outline

CAMM 156
GEOMETRIC DIMENSIONING AND TOLERANCING
3 Semester Hours

The Community College of Baltimore County

Description

Geometric Dimensioning and Tolerancing
Emphasizes the rules used to interpret mechanical engineering drawings according to ANSI/ASME Y15.5M-1994.
Prerequisite: CAMM 111

Overall Course Objectives

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

1. Identify *size features* and *non-size features* on a drawing.
2. Determine the *maximum material condition* and *least material condition* size of a given feature.
3. Explain the *Taylor Principl*e.
4. Select an appropriate method to verify that a size feature is within the limits specified by the *Taylor Principle*.
5. Interpret datum reference information to establish a coordinate system on the part and design a set-up to manufacture and/or inspect the part according to the *datum reference frame*.
6. List the 14 geometric characteristic symbols.
7. Identify the tolerance zones created by the geometric tolerances on a drawing.
8. Explain how to inspect the geometric requirements stated on the drawing.
9. Perform calculations to determine if holes are located within the specified positional tolerance zones.

Major Topics

I. Introduction to Geometric Dimensioning and Tolerancing
   - A. Terms and symbols
   - B. Feature control frames
   - C. Material condition modifiers
   - D. Tolerance zones
   - E. Position tolerance verification
   - F. Taylor Principle

II. Datum Reference Frame Theory
   A. Datum simulators
   B. Datum modifiers
   C. Datum targets
   D. Hole pattern establishing a datum

III. Form Tolerances
   A. Flatness
   B. Straightness of surface line elements
   C. Straightness of an axis or median plane
   D. Circularity (roundness)
   E. Cylindrically

IV. Orientation Tolerances
   A. Parallelism
   B. Perpendicularity
   C. Angularity

V. Profile Tolerances
   A. Bilateral profile
   B. Unilateral profile
   C. Profile of a line
   D. Profile of a surface

VI. Position Tolerances
   A. Cylindrical tolerance zones
   B. Rectangular tolerance zones
   C. Position boundary concept
   D. Composite position tolerance

VII. Coaxial and Non-Cylindrical Controls
   A. Run out tolerances
   B. Position tolerances for coaxial features
   C. Concentricity tolerances
   D. Symmetry tolerances

Course Requirements

Grading: The faculty member will determine grading procedures, and a student can expect a minimum of eight grades from at least four of the following categories:

1. Quizzes
2. Lab projects
3. Written paper
4. Homework assignments
5. Midterm exam
6. Class participation
7. Comprehensive final.

Date Revised: 6/1/00