Common Course Outline

CAMM 156

Geometric Dimensioning and Tolerancing

3 **Credits**

Community College of Baltimore County

Description

CAMM 156 – Geometric Dimensioning and Tolerancing emphasizes the rules used to interpret mechanical engineering drawings to the latest American Society of Mechanical Engineers (ASME) Y15.5 standard.

3 Credits

Prerequisites: CAMM 111 with a passing grade of "C" or higher or NIMS "Measurement, Material and Safety" certification.

Overall Course Objectives

Upon completion of this course, students will be able to:

1. identify size features and non-size features on a drawing;
2. determine the maximum material condition and the least material condition size of given features;
3. explain the Taylor Principal;
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 parts;
6. design a set-up to manufacture and/or inspect the parts according to the datum reference frame;
7. list the geometric characteristic symbols;
8. identify the tolerance zones created by the geometric tolerances on a drawing;
9. explain how to inspect the geometric requirements stated on the drawing; and
10. perform calculations to determine if part features 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 tolerance
B. Position tolerances for coaxial features
C. Concentricity tolerances
D. Symmetry tolerances

Course Requirements

Grading procedures will be determined by the individual faculty member but will include the following:

Grading/exams

- Minimum of 12 classwork assignments
- Minimum of 2 quizzes
- Minimum of 12 homework assignments
- Class participation
- 1 Midterm
- 1 Final exam

Written Assignments: Students are required to use appropriate academic resources.

Other Course Information

Date Revised 12/6/2017