



## MVA004 - Geometric Dimensioning and Tolerancing

### Course outcomes:

- To provide an overview of how computers are being used in mechanical component design
- To understand the application of computers in various aspects of Manufacturing viz.,
- Design, Proper planning, Layout & Material Handling, Dimensioning and tolerance.

### Syllabus:

#### 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. Cylindricity

#### 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

### **Reference Text Books**

1. James D Meadows, “Geometric Dimensioning and Tolerancing”, Marcel Dekker, Inc
2. James D Meadows, “Measurement of Geometric Tolerances in Manufacturing” Marcel Dekker, Inc
3. P S Gill, “Geometric Dimensioning and Tolerancing”, S K Kataria & sons, 2005-6.