

<b>GD&amp;T</b>	<b>Total Duration: 40 Hours</b>
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<b>SESSIONS</b>	<b>CONTENTS</b>
Session 1	<b>Introduction to GD&amp;T</b> <ul style="list-style-type: none"> <li>Importance and benefits of GD&amp;T in modern manufacturing</li> <li>Differences between traditional tolerancing and GD&amp;T</li> <li>Overview of ASME Y14.5-2018 Standard</li> <li>How GD&amp;T integrates with CAD/CAM/CAE and Model-Based Definition (MBD)</li> </ul>
Session 2	<b>GD&amp;T Basics</b> <ul style="list-style-type: none"> <li>Datum Reference Frame (DRF)</li> <li>Features vs. Feature of Size (FOS)</li> <li>Rule #1 (Taylor Principle) and Rule #2 (Regardless of Feature Size)</li> <li>Material Condition Modifiers: MMC, LMC, RFS</li> <li>Basic dimensions and tolerances</li> </ul>
Session 3	<b>Datums and Datum Feature Selection</b> <ul style="list-style-type: none"> <li>Defining Primary, Secondary, and Tertiary Datums</li> <li>Establishing Datum Reference Frame (DRF)</li> <li>Datum targets and simulated datums</li> <li>Real-world examples of functional datum selection</li> </ul>
Session 4	<b>Form Controls</b> <ul style="list-style-type: none"> <li>Straightness</li> <li>Flatness</li> <li>Circularity (Roundness)</li> <li>Cylindricity</li> <li>Application and inspection techniques for form controls</li> </ul>

Session 5	<b>Orientation Controls</b> <ul style="list-style-type: none"> <li>• Perpendicularity</li> <li>• Parallelism</li> <li>• Angularity</li> <li>• How orientation controls relate to datums</li> </ul>
Session 6	<b>Location Controls</b> <ul style="list-style-type: none"> <li>• Position (True Position) <ul style="list-style-type: none"> <li>◦ Projected tolerance zone</li> <li>◦ Composite and two single-segment position tolerancing</li> <li>◦ Pattern locating</li> </ul> </li> <li>• Concentricity (legacy)</li> <li>• Symmetry (legacy)</li> <li>• Use of modifiers and tolerance zones</li> </ul>
Session 7	<b>Profile Controls</b> <ul style="list-style-type: none"> <li>• Profile of a Line</li> <li>• Profile of a Surface</li> <li>• Unilateral vs. Bilateral Tolerances</li> <li>• Controlling complex surfaces with profile</li> <li>• Practical applications in automotive/aerospace components</li> </ul>
Session 8	<b>Runout Controls</b> <ul style="list-style-type: none"> <li>• Circular Runout</li> <li>• Total Runout</li> <li>• Applications in rotating parts (e.g., shafts, bearings)</li> </ul>
Session 9	<b>Advanced GD&amp;T Applications</b> <ul style="list-style-type: none"> <li>• Composite Feature Control Frames</li> <li>• Datum Feature Modifiers (e.g., [M], [L], [S])</li> <li>• Multiple datum systems</li> <li>• Boundary conditions and virtual conditions</li> <li>• Bonus tolerance and functional gaging</li> </ul>

Session 10

## **GD&T in Design & Manufacturing**

- Functional dimensioning
- GD&T in CNC machining
- GD&T in additive manufacturing (3D printing)
- Application in fixture and tooling design
- Effects on assembly and part interchangeability