
Geometric Dimensioning & Tolerancing (GD&T)

Practical Interpretation and Measurement

Course No. 535

FOR WHOM INTENDED: This course is based on the latest ASME Y 14.5 2009 standard. It is intended for individuals performing inspection, design, manufacturing and assembly. Understanding geometric dimensioning and tolerancing is essential for anyone reading blue prints

BRIEF COURSE DESCRIPTION: Course 535 covers the first six units of the *GeoTol Pro Workbook*, Al Neumann's full color practical guide to Geometric Tolerancing that will provide a solid geometric foundation upon which to build, including any related Y-14.5 2009 changes. The course commences by introducing GD&T, the concepts of size control and material tolerances. After defining the terminology to be used, geometric characteristics and symbols, the course proceeds to demonstrate how the geometric system works. Limits of size, position verification, product plans and virtual condition, along with the datum reference frame are discussed in detail during the presentation.

The course covers geometric symbols, application of modifiers like MMC, RFS and LMC along with application of position tolerance measurement and limits of size including virtual condition. The course concludes with a unit on the datum reference frame to ensure students understand how to apply datums to functional parts. Datum features and the degrees of freedom that are constrained by the datum will be explained, permitting a thorough understanding and better application of datums.

Exercises are completed throughout the course to reinforce fundamental principles from which the student will build. Practical drawing applications and engineering wood models are used to help student understanding and assist with the correct application and interpretation of geometrics.

Students will participate and be engaged in practical exercises to demonstrate their understanding of the material covered.

Participants successfully completing this course will be able to understand, evaluate and correctly apply geometric dimensioning and tolerancing. They will be able to read and fully understand geometrics on any engineering drawing.

CERTIFICATE PROGRAMS: This course may be used as an elective for TTI's *Metrology Specialist Certificate (MSC) Program*, or for any other TTI specialist certificate program.

RELATED COURSES: Day One of Course 535 is also offered separately as Course 534, Introduction to Geometric Dimensioning and Tolerancing. *Course 536, Intermediate/Advanced GD&T* picks up where Course 535 leaves off. Additional courses on Tolerance Stacks are also planned.

PREREQUISITES: There are no definite prerequisites for this course. However, this course is intended for individuals involved in a related technical field.

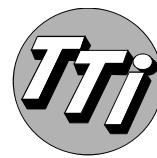
TEXT Each student will receive a full-color course workbook, Al Neumann's *Geo Tol Pro Workbook, A Practical Guide to Geometric Tolerancing per ASME Y14.5 – 2009*, which is considered the definitive reference work in the GD&T industry.

COURSE HOURS, CERTIFICATE AND CEUs Open courses meet seven hours per day. Upcoming presentation dates can be found on our current [open course schedule](#). Class hours/days for on-site courses can vary from 14–35 hours over 2–5 days as requested by our clients. Upon successful course completion, each participant receives a certificate of completion and one Continuing Education Unit (CEU) for every ten class hours.

For [schedules](#), [general information](#) and [registration forms](#), see TTI's web site.

Course Outline

- Introduction, Symbols and Terms
 - Symbols, Terminology
- Limits of Size
 - Go-No Go Gages
 - Hub application
 - Quality product plans:
 - Manufacturing, Dimensional Inspection
- How the Geometric System Works
 - Plus / Minus Tolerancing comparison
 - Hole Bar Example
 - Material Condition Modifiers
 - Effect of Zero Tolerancing at MMC
- Position Tolerance Verification
 - Hole verification
 - Measurement conversion
 - Cartesian and Polar Coordinates
 - Paper Gage
- Product Plans and Virtual Condition
 - Hub application
 - Quality Product Plans
 - Product Plan
 - Manufacturing
 - Dimensional Inspection
 - Virtual Condition
- Datum Reference Frame Theory
 - Implied datums
 - Simulators, Features with and without size
 - Datum Feature Simulator Requirements
 - Establishing and Qualifying a DRF
 - Degrees of Freedom
- Student Exercises-utilizing full color course material in a practical application
- Award of Certificates for Successful Completion



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