



Dimensional Analysis Geometric Dimension & Tolerancing (GD&T)

A quality focused organization has a consistent standardized methodology in applying dimensional analysis into its product development process. Having this system established, understood and consistently utilized creates a real differentiating factor in the marketplace which delivers projects efficiently with proper application of dimensional control on their products.

The application of GD&T is a well defined American National Standard endorsed by The American Society of Mechanical Engineers (ASME) which is utilized in multiple industries. GD&T correctly applied with efficient dimensional schemes can control the systems fit, form and function.

Participants will bring information on specific company projects to be worked on during this training for real application of these concepts, tools and techniques.

- First, the basics dimensional schemes and datums are discussed for a common understanding of how to control variation in a working system.
- Next, participants will focus on the details of each GD&T symbol and control feature to understand their specific application. Then an understanding on how dimensional schemes effectively control how parts interact with each other and fit into a total system.
- Lastly, participants will apply these tools on specific company projects and understand the application of GD&T on their products.



Course Syllabus

I IDENTIFYING INFORMATION

Course:	Dimensional Analysis Geometric Dimension and Tolerancing (GD&T)
Prerequisite:	Understanding of basic drafting techniques Understanding of basic design techniques
Time Frame:	40 total contact hours
Instructor:	Daryl Patrishkoff, PMP Chief Executive Officer, CPS BS in Vocational Industrial Education MA in Business Management 30 years in the product design engineering profession 20 years managing sales, operations & plant business units
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II REFERENCE MATERIALS

1. Fundamentals of Geometric Dimension & Tolerancing, by Alex Krulikowski
2. The Ultimate Pocket Guide on GD&T, by Alex Krulikowski
3. ANSI Y14.5M-2009, Dimensioning and Tolerancing, by ANSI

III COURSE GOALS AND OBJECTIVES

1. Understand and interpreting engineering drawings
2. Understand why geometric tolerancing is superior to coordinate tolerancing
3. Understanding of the following GD&T concepts:
4. Datums and how to use them
5. Material control symbols
6. Tolerances of form and profile
7. Tolerances of orientation and runout
8. Location tolerances
9. Virtual condition
10. Interpret GD&T on example drawings
11. Create GD&T schemes
12. Apply GD&T methods to company specific products



IV METHODOLOGY

This course is a micro view of dimensional analysis and the application of GD&T throughout the product development process. Each module will introduce new material that will prepare the student for the projects to be completed.

Lectures

Each detailed subject will be presented in a lecture format outlining the theory and standardized accepted methodology. A PDF file of the lecture material will be provided for the student's personal use as reference material. Lecture note outlines will be distributed to the students for each lecture to help the student capture personal notes. A short video showing the concept covered and a discussion regarding application.

Specific Industry Examples

Real life industry examples will be covered that detail out the application of the theory to demonstrate how different companies apply these tools and techniques. This will give the students a clear understanding of how and why these techniques are utilized at different companies and industries in different manners.

In-Class Assignments

Using the theory and industry examples the student will conduct several projects that outline each key principal on in-class projects. These projects will increase in complexity as the students further develop their skills in applying these tools and techniques. The students will present their work to the group for review and discussion.

Specific Company Application

As a summary of the training we will apply these tools and techniques on a specific company project that is currently in development by the students. This will build a standard methodology on how to appropriately apply dimensional analysis and GD&T at your company.



V COURSE OUTLINE & ASSIGNMENTS

Module 1

Introduction to Dimensional Analysis	PowerPoint lecture
In-Class Assignment, Angle Bracket	Complete & present
Introduction to GD&T	PowerPoint lecture
Datums, GD&T Symbols and Concepts	PowerPoint lecture
In-Class Assignment, Tapered Angle Bracket	Complete & present

Module 2

GD&T project	PowerPoint lecture
In-Class Assignment, Hinge Assembly	Complete & present
Review of Hinge Assembly	PowerPoint lecture
In-Class Assignment, GD&T project	Complete

Module 3

Review of GD&T project	PowerPoint lecture
In-Class Assignment, Spacer Block	Complete & present
Manufacturing GD&T Applications	PowerPoint lecture
In-Class Assignment, Mounting Bracket	Complete & present

Module 4

Dimensional Stack Ups	View PowerPoint
Group Project	Complete & present

Module 5

Specific Application of GD&T Principals	PowerPoint lecture
Company Specific Group Projects	Complete & present