Western Technical College

31420350 Geometric Dimensioning & Tolerancing

Course Outcome Summary

Course Information

Description	Recognition and interpretation of geometric dimensioning and tolerances symbols and application as applied to prints for manufacture of parts.
Career Cluster	Manufacturing
Instructional Level	Technical Diploma Courses
Total Credits	1
Total Hours	36

Textbooks

Blueprint Reading for Machine Trades. 7th Edition. Copyright 2012. Schultz, Russ. Publisher: Pearson. **ISBN-13**:978-0-13-217220-2. Required.

Learner Supplies

Scientific calculator (recommend T1-36x Solar). **Vendor:** Campus Shop. Required.

Success Abilities

1.   Cultivate Passion: Enhance Personal Connections
2.   Cultivate Passion: Expand a Growth-Mindset
3.   Live Responsibly: Foster Accountability
4.   Refine Professionalism: Act Ethically
5.   Refine Professionalism: Improve Critical Thinking
6.   Refine Professionalism: Participate Collaboratively
7.   Refine Professionalism: Practice Effective Communication

Program Outcomes

1.   MACH 2. Interpret industrial/engineering drawings
2.   MACH 3. Apply precision measuring methods to part inspection

Course Competencies

1. **Explain the rationale for using geometric dimensioning and tolerancing instead of coordinate dimensioning on engineering drawings.**

   Assessment Strategies
   1.1.   In written and applied assignments
   1.2.   On tests and quizzes
   1.3.   Given examples, prints, and handouts

   Criteria

   You will know you are successful when

   1.1.   you correctly describe three major shortcomings of the coordinate tolerancing system
   1.2.   you correctly describe a minimum of three benefits of GD&T
   1.3.   you score an average of 70% or better on all assessments.

   Learning Objectives
   1.a.   Describe the major shortcomings of coordinate tolerancing
   1.b.   Describe the origins of geometric dimension and tolerancing (GD&T).
   1.c.   Explain the benefits of GD&T
   1.d.   Define Geometric Dimensioning and Tolerancing (GD&T)
   1.e.   Identify the ASME dimensioning and tolerancing standard

2. **Correlate geometric dimensioning and tolerancing terminology**

   Assessment Strategies
   2.1.   In the classroom, lab, or shop setting
   2.2.   In written and applied assignments
   2.3.   On tests and quizzes

   Criteria

   Performance will be satisfactory when:

   2.1.   you correctly apply terms on assignments, quizzes and tests
   2.2.   you correctly differentiate between features of size (FOS) and non-features of size (NFS)
   2.3.   you correctly relate three types of material conditions relative to feature size.
   2.4.   you score an average of 70% or better on all assessments.

   Learning Objectives
   2.a.   Define basic GD&T terms required to interpret prints
   2.b.   Describe GD&T modifiers
   2.c.   Define geometric characteristic categories
   2.d.   Define geometric characteristic symbols

3. **Identify geometric dimensioning and tolerancing symbols**

   Assessment Strategies
   3.1.   In the classroom, lab, or shop setting
   3.2.   In written and applied assignments
   3.3.   On tests and quizzes
   3.4.   Given prints, diagrams, and handouts

   Criteria

   You will know you are successful when

   3.1.   you correctly match symbols to terms on assignments, quizzes and tests.
   3.2.   you correctly match abbreviations to terms on assignments, quizzes, and tests.
   3.3.   you correctly identify GD&T symbols.
   3.4.   you correctly identify/interpret other ASME Y14.5M symbols and abbreviations.
   3.5.   you score an average of 70% or better on all assessments.

   Learning Objectives
   3.a.   Identify form symbols
   3.b.   Identify profile symbols
   3.c.   Identify orientation symbols

3.d.	Identify location symbols
3.e.	Identify runout symbols
3.f.	Identify modifiers
3.g.	Identify datum reference letters
3.h.	Identify other ASME Y14.5M symbols and abbreviations

## 4.	Interpret feature control frames

Assessment Strategies
4.1.	In the classroom, lab, or shop setting
4.2.	In written and applied assignments
4.3.	On tests and quizzes
4.4.	Given prints, diagrams, and handouts

Criteria

You will know you are successful when

4.1.	you correctly label the contents of compartments in a feature control frame.
4.2.	you correctly interpret feature control frames in applications.
4.3.	you correctly describe the specified datum(s).
4.4.	you correctly interpret feature size/location variations for each modifier that may occur in a feature control frame.
4.5.	you score an average of 70% or better on all assessments.

Learning Objectives
4.a.	Describe the function of a feature control frame
4.b.	Explain the elements of feature control frames
4.c.	Identify feature control frames on prints
4.d.	Determine the placement of symbols and modifiers in feature control frames
4.e.	Specify the order of precedence for datum references in feature control frames
4.f.	Interpret feature control frames in print applications

## 5.	Adapt geometric dimensioning and tolerancing principles to machine setup applications.

Assessment Strategies
5.1.	In the classroom, lab, or shop setting
5.2.	In written and applied assignments
5.3.	On tests and quizzes
5.4.	Given prints, parts, handouts, and all available shop equipment and supplies

Criteria

You will know you are successful when

5.1.	you revise non-GD&T print/s to GD&T standards.
5.2.	you create machine setup/s and inspection plan/s for GD&T print/s.
5.3.	you score an average of 70% or better on all assessments.

Learning Objectives
5.a.	Work in a team setting to make decisions
5.b.	Revise non-GD&T prints to GD&T standards.
5.c.	Analyze/create machining plans to achieve specified tolerances.
5.d.	Analyze/create inspection plans for completed parts.