COURSE OBJECTIVE: This course will present the principles of geometric dimensioning and tolerancing (GD&T) as applied to industry accepted standards, such as ANSI/SME Y14.5M – 2009. This includes the use and meaning of GD&T symbols on manufactured part drawings. The interpretation of GD&T symbols in feature control frames and the application of GD&T symbols to various working drawings are emphasized.


EVALUATION:
- Mid-Term Exam 100 pts.
- Final Exam 100 pts.
- Assignments (10 pts. each) 50 pts.
- Final Project Report – drawings/calculations 40 pts.
- Oral Presentation 10 pts.

GRADING STANDARDS:
- A: 90-100%
- B: 80-89%
- C: 70-79%
- D: 60-69%
- F: <60%

EQUIPMENT: A hand-held scientific calculator.

GRADING POLICY: No late homework will be accepted and missed exams have a 20% penalty unless an appropriate, prior excuse is given to the instructor. The missed exam must be completed on the make-up date set by the instructor.

ACADEMIC CONDUCT: Cheating on examinations, submitting work of other students as your own, or plagiarism in any form will result in penalties ranging
from an F on the assignment to expulsion from the university, depending on the seriousness of the offense.

MAJOR TOPICS:
- ANSI/ASME Y14.5M standard
- GD&T rules and practices
  - Maximum material conditions (MMC)
  - Least material conditions (LMC)
  - Extreme form variation
- GD&T symbols and terms
  - Feature Control Frame
  - Basic dimensions
  - Geometric characteristic symbol
  - Bonus tolerance
- Datum’s
  - ANSI/ASME Y14.5M symbols
  - Datum targets
- Form and Profile Tolerances
  - Straightness
  - Flatness
  - Circularity and Cylindricity
  - Profile of a line/surface
- Orientation and runout
  - Parallelism
  - Perpendicularity
  - Angularity
- Location tolerances
  - Position
  - Concentricity
  - Virtual condition

MINIMUM STUDENT COMPETENCIES:
- Interpret dimensioning rules
- Identify different dimensioning practices
- Explain coordinate tolerancing uses
- Explain geometric tolerancing benefits
- Compare coordinate versus geometric tolerancing
- Identify different tolerance types
- Interpret mating part fits
- Interpret tolerancing fundamentals
- Identify geometric characteristic symbols
- Draw feature control frames
- Interpret feature control frames
- Identify datum surfaces
- Identify datum axis
- Identify datum center planes
- Identify datum target symbols
- Interpret datum’s
- Interpret material condition symbols
- Analyze straightness tolerances
- Measure feature straightness
- Analyze flatness tolerances
- Measure feature flatness
- Analyze circularity tolerances
- Measure feature circularity
- Analyze cylindricity tolerances
- Measure feature cylindricity
- Draw form tolerance symbols
- Interpret form tolerances
- Analyze profile of a line tolerances
- Analyze profile of a surface tolerances
- Draw profile tolerance symbols
- Interpret profile tolerances
- Analyze parallelism tolerances
- Measure feature parallelism
- Analyze perpendicularity tolerances
- Measure feature perpendicularity
- Analyze angularity tolerances
- Measure feature angularity
- Analyze circular runout tolerances
- Analyze total runout tolerances
- Measure feature runout
- Draw orientation tolerance symbols
- Draw runout tolerance symbols
- Interpret orientation and runout tolerances
- Define true position
- Measure feature positioning
- Analyze multiple feature positional tolerancing
- Analyze composite pattern tolerancing
- Analyze two single-segment feature control frames
- Draw location tolerance symbols
- Interpret tolerances of position
- Analyze projected tolerance zones
- Analyze concentricity tolerances
- Analyze coaxial tolerances
- Measure feature concentricity
- Analyze symmetry tolerances
- Interpret virtual condition
COURSE WORK

WEEKEND ONE

**August 25th**
Print Reading Lecture
Chapter 1
Chapter 2
Print Reading Exercises
**Assignment #1**

**August 26th**
Chapter 3
Chapter 4
Print Reading Exercises
**Assignment #2**

WEEKEND TWO

**September 8th**
Chapter 5
Quality Inspection Lecture
**Assignment #3 (Caliper and Micrometer Readings)**
**Mid-Term Exam**

**September 9th**
Chapter 6
Chapter 7
**Assignment #4**

WEEKEND THREE

**September 22nd**
Chapter 8
Chapter 9
**Assignment #5**

**September 23rd**
Chapter 10
Essay/Oral Presentation
**Final Exam**