Course Number and Title: MET 104 Geometric Dimension & Tolerance

Campus Location:
Stanton

Effective Date:
2021-51

Prerequisite:
MET 123, EDD 131, SSC 100 or concurrent

Co-Requisites:
None

Course Credits and Hours:
2.00 credits
2.00 lecture hours/week
0.00 lab hours/week

Course Description:
This introductory course is based on American Society of Mechanical Engineers (ASME)/ American National Standards Institute (ANSI) Y14.5-2009. Topics include datums, general tolerancing, symbols and terms, location tolerances, material condition symbols, and tolerances of orientation and runout.

Required Text(s):
Obtain current textbook information by viewing the campus bookstore - https://www.dtcc.edu/bookstores online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:
None

Schedule Type:
Classroom Course

Disclaimer:
None

Core Course Performance Objectives (CCPOs):

1. Demonstrate conventional tolerancing practices relating to conventional dimensioning. (CCC 1, 2, 3; PGC 1)
2. Classify the various types of symbols with identification of their names, shapes, and sizes. (CCC 1, 2, 4; PGC 2)
3. Accurately list data with respect to surfaces, points, lines, and axes. (CCC 1, 2; PGC 2)
4. Identify the relationship between material condition symbols and the size or location of features and tolerances. (CCC 1, 2; PGC 2)
5. Define the concepts and techniques of dimensioning and tolerancing to control the form and profile of geometric shapes. (CCC 1, 2; PGC 2)
6. Apply the techniques needed to control orientation and runout of geometric shapes. (CCC 1, 2; PGC 2)
7. Show location tolerances that include position, concentricity, and symmetry. (CCC 1, 2; PGC 2)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):
Upon completion of this course, the student will:

1. Demonstrate conventional tolerancing practices relating to conventional dimensioning.
    1. State values on typical shop drawings that apply to a physical portion of a part.
    2. Illustrate variations of material conditions.
    3. List the general groups related to fits between mating parts.
    4. Describe chain versus datum dimensioning.
2. Classify the various types of symbols with identification of their names, shapes, and sizes.
    1. Organize geometric characteristic symbols.
    2. Explain a datum target symbol.
    3. Describe typical feature control frame compartments.
    4. List supplementary symbols.
3. Accurately list data with respect to surfaces, points, lines, and axes.
    1. Illustrate the datum reference frame concept.
    2. Construct datum target points.
    3. Identify axis and center plane datums.
4. Identify the relationship between material condition symbols and the size or location of features and tolerances.
    1. Define a perfect form boundary.
    2. Choose the symbols that establish the relationship between the size or location of the feature and geometric tolerance.
    3. Explain the datum preference.
5. Define the concepts and techniques of dimensioning and tolerancing to control the form and profile of geometric shapes.
    1. Explain surface straightness.
    2. Identify the flatness tolerance symbol.
    3. Demonstrate how forms are controlled.
    4. List profile controls.
6. Apply the techniques needed to control orientation and runout of geometric shapes.
    1. Indicate the symbols used to control orientation tolerances.
    2. List the symbols used for controlling runout of geometric shapes.
    3. Define combinations of geometric tolerances.
7. Show location tolerances that include position, concentricity, and symmetry.
    1. Illustrate a true position.
    2. Explain the differences between conventional and positional tolerancing.
    3. Identify multiple features of an object.
    4. Demonstrate position tolerances of coaxial features.

Evaluation Criteria/Policies:
The grade will be determined using the Delaware Tech grading system:

90	–	100	=	A
80	–	89	=	B
70	–	79	=	C
0	–	69	=	F

Students should refer to the Student Handbook - https://www.dtcc.edu/handbook for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Use effective problem-solving skills and make appropriate decisions relative to the machinist profession.
2. Explain geometric dimensioning and tolerancing on engineering drawings.
3. Demonstrate advanced machining skills, advanced welding, and create machine control data using CAM software for computer numerical control applications.
4. Select appropriate materials for basic mechanical applications.
5. Exhibit professional traits, including the ability to work with minimal supervision, willingness to learn new skills, and contributing to learn project efforts.

Disabilities Support Statement:
The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the disabilities services - https://www.dtcc.edu/disabilitysupport web page or visit the campus Advising Center.