TECH PREP/MTAG CURRICULUM

Precision Measurement

Lesson Plan

Time Allotment: 16 hours
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MODULE DESCRIPTION

Students will gain proficiency in precision measurement using the machinist's rule, the protractor, the vernier caliper, and the one-inch external micrometer. Students will demonstrate their ability to make precision measurements by measuring various parts and verifying conformance to tolerances.

MODULE OUTCOME

After completing this module, students should be able to make precision measurements using these instruments by measuring various parts and verifying conformance to tolerances.

MTAG COMPETENCIES INTRODUCED

B 1.2 Select and use appropriate measuring techniques and instruments
B 4.2 Demonstrate proper measurement tool usage

SCANS COMPETENCIES INTRODUCED

F3: Mathematics - chooses appropriate mathematical techniques

PERFORMANCE CRITERIA

- Given a technical drawing and an object, the student will be able to select and use of the appropriate measurement tools and techniques to transfer specifications to the object with an accuracy that conforms to the tolerances given.
- Given an object and the necessary measurement tools, the student will be able to correctly demonstrate how to use the tools to make necessary measurements to create a technical drawing

SEQUENCING

Introduction
Measuring Length
    Types of Steel Rules
    Fractional Measurement with Steel Rules
    Skill check for Fractional Measurements with the Steel Rule
    Decimal Measurements with the Steel Rule

Skill check for Decimal Measurements with the Steel Rule
Measuring Angles
Protractors
Skill Check on Measuring Angles with a Protractor
Measuring Depth and Diameter
Types of Calipers
Measurement with Vernier Calipers
Skill Check on Measuring with Vernier Calipers
Types of Micrometers
Introduction to the Micrometer
Micrometer Exercise
Final Skill Check
Module Evaluation

EQUIPMENT AND SUPPLIES NEEDED:

Machinist's steel rules, calibrated in 32nds and 64ths on one side, tenths and hundredths on the others - one per student or student team
Protractors - one per student or student team
Vernier calipers - one per student or student team
One-inch external micrometers - one per student or student team
Assorted small square/rectangular blocks/cylinders/pins/bolts/ball bearings to measure.

INDEX OF INSTRUCTIONAL MATERIALS

RECOMMENDED STUDENT PREREQUISITES

Completed the Following Modules:
Applied Mathematics
Interpreting Technical Drawing