

SYLLABUS  
PART I  
EDISON COMMUNITY COLLEGE  
MFG 110S METROLOGY  
3 CREDIT HOURS

COURSE DESCRIPTION

Use of engineering measuring instruments such as micrometers, vernier calipers, scales, height gages, gage blocks, surface plates, comparators and coordinate measuring machine. Emphasis on relationship of drawing dimensions to the measurement of parts. Precision, accuracy, standards, and record keeping are discussed. Lab fee.

COURSE GOALS

The student will:

1. Define and apply basic measurement terms.
2. Recognize ethical considerations in accurate reporting and record keeping.
3. Demonstrate competence in applying the three basic measuring systems: fractional inch, decimal inch, and metric.
4. Make calculations and measurements using scientific notation.
5. Interpret drawing dimensions and accurately apply them to the measurement of parts.
6. Quantify tolerances and explain their significance in gage selection.
7. Identify and select the proper inspection instrument for a given application.
8. Set up a part for inspection given the datum reference frame from a drawing.
9. Apply correctly, a variety of measuring instruments and setups and interpret results from those measurements.
10. Apply the principles of calibration to various inspection instruments.
11. Explain the principles used in electronic and pneumatic gages.
12. Describe the application of ultrasonic and laser measurement.
13. Explain the application of coordinate measuring machines to manufacturing.
14. Measure parts using the coordinate measuring machine.

CORE VALUES

The Core Values are a set of principles which guide in creating educational programs and environments at Edison. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will introduce/reinforce these Core Values whenever appropriate.

TOPIC OUTLINE

1. Reasons for Measurement
2. Ethical Considerations in Inspection
3. Measurement Terminology and Systems
4. Drawing dimensions and tolerances for measurement
5. Graduated Scales and Scaled Instruments
6. The Combination Square and Part Layout
7. Vernier Instruments: Calipers, Height Gages
8. Gaging Pressure
9. Micrometer Instruments
10. Gage Blocks
11. Measurement by Comparison

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12. Dial Indicators and Comparators
13. Datum Reference Frames and Setup for Measurement
14. Electronic Measurement
15. Pneumatic Measurement
16. Calibration Standards and Procedures
17. Angular Measurement
18. Surface Finish and Its Measurement
19. Optical Comparators
20. Coordinate Measuring Machines
21. Advanced Measuring Techniques