

**SAN DIEGO COMMUNITY COLLEGE DISTRICT  
MIRAMAR COLLEGE  
ASSOCIATE DEGREE COURSE OUTLINE**

**SECTION I****SUBJECT AREA AND COURSE NUMBER:** Diesel Technology 105**COURSE TITLE:** Measuring Tools and Applied Mathematics**Units: 2**  
Grade Only**CATALOG COURSE DESCRIPTION:**

Students learn how to care for and use precision measuring tools and common shop measuring tools. They also learn industry- standard mathematical concepts and applications as related to the diesel maintenance industry.

**REQUISITES:**

**Corequisite: Completion of or concurrent enrollment in:**  
DIES 100 with a grade of "C" or better, or equivalent

**Limitation on Enrollment:**

This course is not open to students with previous credit for DIES 110 or 120

**FIELD TRIP REQUIREMENTS:** May be required**TRANSFER APPLICABILITY:** Associate Degree Credit & transfer to CSU and/or private colleges and universities**TOTAL LECTURE HOURS:** 16 - 18**TOTAL LAB HOURS:** 48 - 54**STUDENT LEARNING OBJECTIVES:**

Upon successful completion of the course the student will be able to:

1. Solve arithmetic problems in the customary and metric measurement systems
2. Solve common measuring problems related to diesel technology
3. Differentiate the fundamental principles of the inch and metric measuring systems
4. Describe the proper use of inch and metric torque wrenches
5. Describe the proper use of feeler gauges
6. Describe the proper use of screw pitch gauges
7. Describe the proper use of straight edges
8. Describe the proper use of a 6-inch steel rule; demonstrate the manipulative skills necessary for its correct use
9. Describe the proper use of an outside micrometer; demonstrate the manipulative skills necessary for its correct use
10. Describe the proper use of a depth micrometer; demonstrate the manipulative skills necessary for its correct use
11. Describe the proper use of an inside micrometer; demonstrate the manipulative skills necessary for its correct use

12. Describe the proper use of general dial indicators; demonstrate the manipulative skills necessary for their correct use
13. Describe the proper use of special purpose dial indicators; demonstrate the manipulative skills necessary for their correct use
14. Describe the proper use of vernier calipers; demonstrate the manipulative skills necessary for their correct use
15. Describe the proper use of dial calipers; demonstrate the manipulative skills necessary for their correct use
16. Describe the proper use of analog test gauges; demonstrate the manipulative skills necessary for their correct use
17. Describe the proper use of digital test gauges; demonstrate the manipulative skills necessary for their correct use
18. Demonstrate the manipulative skills needed to read micrometers
19. Demonstrate the manipulative skills needed to read dial indicators
20. Evaluate and record the condition of a diesel crankshaft
21. Calculate the depth-of-cut for cylinder block counterbores.

## **SECTION II**

### **1. COURSE OUTLINE AND SCOPE:**

#### **A. Outline Of Topics:**

The following topics are included in the framework of the course but are not intended as limits on content. The order of presentation and relative emphasis will vary with each instructor.

- I. Measuring systems
  - A. Inch
  - B. Metric.
- II. Calculator functions
  - A. Addition
  - B. Subtraction
  - C. Multiplication
  - D. Division.
- III. Torque wrenches
  - A. Function
  - B. Uses
  - C. Care and maintenance.
- IV. Feeler gauges
  - A. Function
  - B. Uses
  - C. Care and maintenance.
- V. Screw pitch gauges
  - A. Function
  - B. Uses
  - C. Care and maintenance.
- VI. Straight edges
  - A. Function
  - B. Uses
  - C. Care and maintenance.
- VII. Six-inch steel rule
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Usage.
- VIII. Outside micrometer
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Usage.

- IX. Depth micrometer
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Usage.
- X. Inside micrometer
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Usage.
- XI. General dial indicators
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Usage.
- XII. Specific dial indicators
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Usage.
- XIII. Vernier calipers
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Usage.
- XIV. Dial indicators
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Usage.
- XV. Analog measuring tools
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Pressure gauges
  - E. Vacuum gauges
  - F. Mercury manometer
  - G. Water manometer.
- XVI. Digital measuring tools
  - A. Function
  - B. Uses
  - C. Care and maintenance
  - D. Tachometer
  - E. Pyrometer.
- XVII. Micrometer reading
  - A. Inch
  - B. Metric.
- XVIII. Dial indicator reading
  - A. Inch
  - B. Metric.

**B. Reading Assignments:**

Reading assignments are required and may include but, are not limited to, the following:

- I. 1. Chapters from course textbook(s)
- II. 2. Articles related to diesel repair in professional journals such as Service Tech, Diesel Progress, Commercial Carrier Journal (CCJ), Utility Fleet, Fleet Owner, and Transportation Equipment News
- III. 3. Reports, repair manuals, on-line resources, and laboratory guides associated with diesel technology.

**C. Appropriate Assignments that Demonstrate Critical Thinking:**

Critical thinking assignments are required and may include, but are not limited to, the following:

- I. 1. Analyzing methods learned in class and utilizing appropriate methods for completing laboratory tasks
- II. 2. Evaluating and recording the condition of a diesel crankshaft
- III. 3. Calculating the depth-of-cut for cylinder block counterbores
- IV. 4. Calculating and solving mathematical problems.

**D. Appropriate Outside Assignments:**

Outside assignments may include, but are not limited to, the following:

- I. 1. Conducting research
- II. 2. Completing all reading and writing assignments, including a shop notebook and a measuring project report
- III. 3. Completing field assignments/projects.

**E. Writing Assignments:**

Writing assignments are required and may include, but are not limited to, the following:

- I. 1. Preparing a shop notebook
- II. 2. Writing an crankshaft evaluation report
- III. 3. Responding to short essay questions about related topics such as the use and care of precision measuring tools.

**2. METHODS OF EVALUATION:**

A student's grade will be based on multiple measures of performance unless the course requires no grade. Multiple measures may include, but are not limited to, the following:

- I. Performing manipulative skills as needed to complete laboratory assignments satisfactorily
- Successfully applying theory to laboratory assignments
- Performing on written and/or practical examinations
- Performing on out-of-class assignments including a measuring project report
- Contributing to class discussion
- Maintaining attendance per current department policy.

**3. METHODS OF INSTRUCTION:**

Methods of instruction may include, but are not limited to, the following:

- \* Other (Specify)
- \* Lecture
- \* Lecture Discussion
- \* Computer Assisted Instruction
- \* Laboratory
- \* Discussion Seminar
- \* Lecture-Lab Combination
- \* Learning Modules
- \* Audio-Visual
- \* Collaborative Learning
- \* Shadowing
- \* A. Demonstration
- \* B. Field trips and/or field assignments.

**4. REQUIRED TEXTS AND SUPPLIES:**

Textbooks may include, but are not limited to:

**TEXTBOOKS:**

1. Moore, George. Practical Problems in Math F/Auto Technology, 5th ed. Delmar, 1998, ISBN: 0827379447

**MANUALS:**

**PERIODICALS:**

**SOFTWARE:**

**SUPPLIES:**

1. Shop notebook (8 1/2 x 11)
2. Safety glasses
3. Calculator
4. Appropriate clothing and footwear for shop work
5. Scantron answer sheets

**ORIGINATOR:** Curricunet Version 2

**CO-CONTRIBUTOR(S)**

**DATE:** 08/30/2002