

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

**SECTION I****SUBJECT AREA AND COURSE NUMBER:** Diesel Technology 144**COURSE TITLE:** Electronics for Diesel Technology**Units: 3**  
Grade Only**CATALOG COURSE DESCRIPTION:**

Students learn the basic principles of electronics related to heavy duty diesel powered equipment. Topics include basic electrical theory, series circuits, parallel circuits, circuit testing, and component identification.

**REQUISITES:**

NONE

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

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

1. Describe basic electrical theory
2. Describe basic electrical laws and demonstrate the ability to use them
3. Differentiate types of electricity
4. Describe the series circuit and demonstrate the ability to perform circuit analysis
5. Describe the parallel circuit and demonstrate the ability to perform circuit analysis
6. Describe the parallel circuit and demonstrate the ability to perform circuit analysis
7. Describe the combination circuit and demonstrate the ability to perform circuit analysis
8. Identify circuit components and their symbols
9. Differentiate basic test procedures and analyze test results
10. Diagnose electronics using electronic test equipment.

**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. Basic electrical theory
  - A. Introduction
  - B. Voltage
  - C. Current
  - D. Resistance
  - E. Power
  - F. Electron flow
  - G. Conventional flow.
- II. Basic electrical laws
  - A. Introduction
  - B. Ohm's Law
  - C. Kirchoff's Voltage Law
  - D. Kirchoff's Current Law
  - E. Power Law
  - F. Application.
- III. Types of electricity
  - A. Application
  - B. Alternating (AC)
  - C. Direct (DC).
- IV. Series circuit
  - A. Introduction
  - B. Identification
  - C. Voltage
  - D. Current
  - E. Power
  - F. Resistance
  - G. Applications
  - H. Circuit analysis.
- V. Parallel circuit
  - A. Introduction
  - B. Identification
  - C. Voltage
  - D. Current
  - E. Power
  - F. Resistance
  - G. Applications
  - H. Circuit analysis.
- VI. Combination circuit
  - A. Introduction
  - B. Identification
  - C. Types
  - D. Voltage
  - E. Current
  - F. Power
  - G. Resistance
  - H. Applications
  - I. Circuit analysis.
- VII. Circuit components and symbols
  - A. Introduction
  - B. Types
  - C. Identification.
- VIII. Test procedures
  - A. Applications
  - B. Tools.
- IX. Electronic testing
  - A. Introduction
  - B. Application
  - C. Tooling.

**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 electronic circuit analysis tasks
- II. 2. Evaluating and recording series and parallel resistance by formula
- III. 3. Troubleshooting electronic diesel engines
- 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 an electronic engine test sequence 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 a circuit resistance analysis report
- III. 3. Responding to short essay questions about related topics such as Ohm's law, series/parallel circuits, and schematic symbols.

**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 on written, oral, and/or practical examinations
- Performing on out-of-class assignments including electronic component identification and description
- 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:

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

#### **4. REQUIRED TEXTS AND SUPPLIES:**

Textbooks may include, but are not limited to:

##### **TEXTBOOKS:**

1. Caterpillar, Inc.. Electronic Troubleshooting, SENR5112-01, 1st ed. Caterpillar, Inc., 1999,
2. Petruzella, Glen.. Automotive Electronic Fundamentals, 1st ed. Glencoe, 1995, ISBN: 0028199308

##### **MANUALS:**

##### **PERIODICALS:**

##### **SOFTWARE:**

##### **SUPPLIES:**

1. Safety glasses
2. Calculator
3. Shop notebook (8 1/2 x 11" spiral bound)
4. Scantron answer sheets

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**CO-CONTRIBUTOR(S)**

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