

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

SECTION I**SUBJECT AREA AND COURSE NUMBER:** Diesel Technology 138**COURSE TITLE:** Electrical Systems**Units: 3**
Grade Only**CATALOG COURSE DESCRIPTION:**

Students learn the principles and practices in operating and servicing diesel truck and equipment electrical systems. These systems include cab and chassis wiring, American Trucking Association (ATA) trailer wiring, and the starting and charging system including troubleshooting with the use of wiring diagrams and diagnostic tools.

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 130 or 215

FIELD TRIP REQUIREMENTS: May be required**TRANSFER APPLICABILITY:** Associate Degree Credit & transfer to CSU and/or private colleges and universities**TOTAL LECTURE HOURS:** 32 - 36**TOTAL LAB HOURS:** 48 - 54**STUDENT LEARNING OBJECTIVES:**

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

1. Demonstrate and explain the safe handling of electrical system components and special tools
2. Use appropriate electrical terms orally and in written reports of lab activities
3. Select and use appropriate test instruments and equipment to evaluate electrical systems
4. Perform diagnostic checks of starting, charging, and lighting systems on trucks and heavy equipment including voltage drop, current flow, and load tests
5. Use electrical schematics and diagrams to interpret plausible causes for an electrical system open or short
6. Identify common hardware and components used in electrical systems; select those appropriate for lab assignments
7. Diagnose and formulate repair plans for electrical system problems.

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. Course overview
 - A. Course content
 - B. Grading system
 - C. Safe working procedures
 - D. Project organization
 - E. Handling components
 - F. Special tools.
- II. Introduction to electrical systems
 - A. Terms and theory
 - B. Electrical component safety
 - C. Wiring diagrams.
- III. Electrical service hardware
 - A. Function and selection
 - B. Service procedures
 - C. Problem diagnosis.
- IV. Batteries
 - A. Theory of operation
 - B. Service procedures
 - C. Testing and problem diagnosis.
- V. Starting systems
 - A. Theory of operation
 - B. Service procedures
 - C. Problem diagnosis.
- VI. Charging systems
 - A. Theory of operation
 - B. Service procedures
 - C. Problem diagnosis.
- VII. Accessories and lighting
 - A. Theories of operation
 - B. Service procedures
 - C. Problem diagnosis.

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 major electrical system components
- III. 3. Formulating repair plans for major electrical system components
- 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 relating to electrical component and system updates at Delco Remy and

Peterbilt websites

II. 2. Completing all reading and writing assignments, including a shop notebook and a vehicle lighting function safety report

III. 3. Completing a field assignment report on a site visit to a local truck and/or equipment repair shop.

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 diesel truck starting system voltage drop report

III. 3. Responding to short essay questions about related topics such as truck and equipment cab and chassis wiring, charging systems, and wiring diagrams.

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, oral, and/or practical examinations Performing on out-of-class assignments including diesel engine reports and projects

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

* Laboratory

* Lecture-Lab Combination

* Other (Specify)

* A. Demonstration

* B. Field trips/or field assignments

* C. Computer-assisted instruction.

4. REQUIRED TEXTS AND SUPPLIES:

Textbooks may include, but are not limited to:

TEXTBOOKS:

1. Brady, Robert N.. Heavy Duty Trucks & Power Train Systems & Services, 1st ed. Prentice-Hall, 1997, ISBN: 0131814702

2. Caterpillar, Inc.. DC Electrical Troubleshooting, SENR 4110-02, 2nd ed. Caterpillar, Inc., 2000,

3. Lewis, Jim.. DIES-M Daily Reports, 2nd ed. Miramar Reprographics, 1976,

MANUALS:

PERIODICALS:

SOFTWARE:

SUPPLIES:

1. Safety glasses

2. Hearing protection

3. Calculator

4. Appropriate clothing and footwear for shop work

5. Scantron answer sheets

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CO-CONTRIBUTOR(S)

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