

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

SECTION I**SUBJECT AREA AND COURSE NUMBER:** Diesel Technology 170**COURSE TITLE:** Truck Drive Axles and Specifications**Units: 3**
Grade Only**CATALOG COURSE DESCRIPTION:**

Students learn about the theory and practices involved in disassembling and rebuilding common heavy duty drive axles. They also learn about failure analyses and basic specification procedures for Class 6 through Class 8 trucks.

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 140 or 211B

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. Explain safe shop procedures related to working with heavy duty drive axle components
2. Demonstrate safe shop procedures related to working with heavy duty drive axle components
3. Organize shop projects safely and efficiently
4. Identify special tools and hardware used in areas of truck rear axle maintenance and overhaul
5. Select and properly use specialized tools and hardware for truck rear axle maintenance and overhaul
6. Explain the guidelines for handling internal and external drive axle components
7. Describe the theory of operation of single and double reduction drive axles
8. Demonstrate proper service procedures for drive axles and drive axle components
9. Explain common problem diagnoses of rear drive axles and drive axle components
10. Explain vehicle classification of Class 6 through Class 8 heavy duty trucks
11. Recognize the classification of roadways
12. Calculate the horsepower required for speed of Class 6 through Class 8 heavy duty trucks
13. Calculate the driveability and gradeability of Class 6 through Class 8 heavy duty trucks
14. Compare the performance of Class 6 through Class 8 heavy duty trucks when ratio or horsepower changes are made to powertrain components or grade specifications.

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. Special tools and hardware
 - F. Guidelines for handling components.
- II. Drive axles
 - A. Theory of operation
 - B. Service procedures
 - C. Problem diagnosis.
- III. Specifications
 - A. Classification of vehicles
 - B. Classification of roadways
 - C. Horsepower for speed
 - D. Driveability and gradeability
 - E. Vehicles as systems.

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 drive axle components
- III. 3. Formulating repair plans for drive axle components
- IV. 4. Calculating and solving mathematical problems
- V. 5. Determining the gradeability of a Class 8 truck.

D. Appropriate Outside Assignments:

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

- I. 1. Conducting research relating to drive axle updates at Meritor and Eaton websites
- II. 2. Completing all reading and writing assignments, including a shop notebook and a Meritor driveability report
- III. 3. Completing a field assignment report on a site visit to a local drive axle 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 drive axle specification report

III. 3. Responding to short essay questions about related topics such as the operation, assembly/disassembly, and/or repair of heavy duty drive axles.

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 drive axle 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:

- * Laboratory
- * Lecture-Lab Combination
- * Other (Specify)
- * Lecture
- * A. Demonstration
- * B. Field trips and/or field assignments.

4. REQUIRED TEXTS AND SUPPLIES:

Textbooks may include, but are not limited to:

TEXTBOOKS:

1. Brady, Robert N.. Heavy Duty Trucks: Power Trains and Suspension Systems, 1st ed. Prentice-Hall, 1998, ISBN: 0835952320
2. Lewis, Jim. DIES-M Daily reports, 2nd ed. Miramar Reprographics, 1976,

MANUALS:

PERIODICALS:

SOFTWARE:

SUPPLIES:

1. Safety glasses
2. Shop notebook (8 1/2 x 11" spiral bound)
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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