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SAN DIEGO COMMUNITY COLLEGE DISTRICT
MIRAMAR COLLEGE
ASSOCIATE DEGREE COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER: Diesel Technology 160

COURSE TITLE: H.D. Transmissions **Units:** 3
Grade Only

CATALOG COURSE DESCRIPTION:

This course covers the principles of operation, overhaul, maintenance, and troubleshooting of heavy duty transmissions. This includes main, auxiliary, and twin countershaft manual transmissions and air shift systems.

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 211A

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 the theory of operation of heavy duty manual transmissions
2. Compare and contrast types of transmissions and transmission applications
3. Demonstrate and describe the operation and assembly of common air shift systems used on heavy duty manual transmissions
4. Select and use the tooling to disassemble, repair, and reassemble heavy duty manual transmissions
5. Detect the need for and perform major overhaul operations on heavy duty manual transmissions
6. Evaluate and formulate a repair plan of a heavy duty manual transmission or its major components
7. Demonstrate the ability to prepare written reports of lab activities and procedures relating to heavy duty transmissions.

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. Manual transmissions
   A. Theory of operation
   B. Main units
   C. Auxiliary units
   D. Tandem units
   E. Twin countershaft types
   F. Air shift systems
   G. Disassembly and failure analysis
   H. Rebuilding
   I. Problem diagnosis.

B. **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 transmission components
III. 3. Formulating repair plans for major transmission components
IV. 4. Calculating and solving mathematical problems.

C. **Appropriate Outside Assignments:**
Outside assignments may include, but are not limited to, the following:

I. 1. Conducting research relating to transmission updates at Eaton and Spicer websites
II. 2. Writing a 16-speed power flow report
III. 3. Completing a field assignment report on a site visit to a local heavy-duty truck transmission repair shop.

D. **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 air shift performance report
III. 3. Responding to short essay questions about related topics such as the operation, disassembly/assembly, and repair of main and auxiliary manual transmissions.

E. **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.

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. Eaton.. Eaton Fuller Transmission Manual, RTO1258LL/RT12509/RT12513, 2nd ed. Eaton Corp., 2000,
3. Eaton.. Eaton Fuller Transmission Manual, RTO958LL/RT9509/RT9513, 2nd ed. Eaton Corp., 2000,
4. Lewis, Jim.. DIES-M Daily Reports, 2nd ed. Miramar Reprographics, 1982,

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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