

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

**SECTION I****SUBJECT AREA AND COURSE NUMBER:** Diesel Technology 190**COURSE TITLE:** Power Trains B (HDT)**Units: 6**  
Grade Only**CATALOG COURSE DESCRIPTION:**

This Heavy Duty Transportation (HDT) course covers the principles and practices involved in operating and servicing mobile hydraulic systems and components. These systems and components include reservoirs, pumps, actuators, valves, piping, and fittings. Students also learn how to maintain, overhaul, and troubleshoot HDT automatic transmissions using accepted industry standards and procedures.

**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 165 or 200

**FIELD TRIP REQUIREMENTS:** May be required**TRANSFER APPLICABILITY:** Associate Degree Credit & transfer to CSU and/or private colleges and universities**TOTAL LECTURE HOURS:** 64 - 72**TOTAL LAB HOURS:** 96 - 108**STUDENT LEARNING OBJECTIVES:**

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

1. Analyze and explain the purpose and operation of hydraulic systems and components and the function of heavy duty automatic transmissions
2. Demonstrate the ability to properly disassemble and reassemble hydraulic components and heavy duty automatic transmissions
3. Prepare written records of repairs and lab activities including the evaluation of hydraulic components and heavy duty automatic transmissions used in class
4. Use accepted industry tools and procedures to diagnose problems and assess the serviceability of hydraulic systems and heavy duty automatic transmissions
5. Demonstrate the ability to read and understand International Organization for Standardization (ISO) hydraulic schematics
6. Assess and perform required maintenance on heavy duty transportation hydraulic systems and automatic 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. Organization and procedures
  - A. Course content and instructional procedures
  - B. Safe working procedures
  - C. Project organization
  - D. Handling components
  - E. Special tools.
- II. Fundamentals of hydraulics
  - A. Fluids, reservoirs, screens, and filters
  - B. Lines, construction, and service
  - C. Control and relief valves
  - D. Linear actuators and hydraulic motors
  - E. Basic systems and circuits
  - F. Problem diagnosis of systems
- III. Automatic transmissions
  - A. Torque converters
  - B. Hydraulic system
  - C. Operation of controls
  - D. Unit disassembly and assembly
  - E. Service procedures
  - F. Problem diagnosis.

#### **B. Writing Assignments:**

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

- I. 1. Completing assigned papers or reports including a shop notebook
- II. 2. Responding to short answer/essay questions about the operation, maintenance, and repair of hydraulic components and heavy duty automatic transmissions
- III. 3. Preparing written records of repairs and lab activities including a written evaluation of hydraulic components and automatic transmissions.

#### **C. Reading Assignments:**

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

- I. 1. Course texts and repair manuals
- II. 2. Professional journals such as Heavy Duty Trucking, Service Tech, Fleet Owner, Maintenance Manager, Fleet Equipment, and Transportation Equipment News
- III. 3. Laboratory guides associated with hydraulic systems and components and heavy duty automatic transmissions.

#### **D. Appropriate Assignments that Demonstrate Critical Thinking:**

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

- I. 1. Evaluating hydraulic components and automatic transmissions and formulating repair plans
- II. 2. Analyzing and explaining the function of heavy duty transportation automatic transmissions and hydraulic systems and components
- III. 3. Calculating and solving mathematical problems.

#### **E. 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 written

evaluation of hydraulic components and automatic transmissions  
III. 3. Completing field assignments/projects.

## **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 satisfactorily complete laboratory assignments Applying theory to laboratory assignments Performing on written, oral, and/or practical examinations Performing on out-of-class assignments including writing assignments Contributing to class discussions.

## **3. METHODS OF INSTRUCTION:**

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

- \* Lecture
- \* Lecture Discussion
- \* Computer Assisted Instruction
- \* Laboratory
- \* Discussion Seminar
- \* Lecture-Lab Combination
- \* Learning Modules
- \* Audio-Visual
- \* Collaborative Learning
- \* Other (Specify)
  - \* 1. Demonstration;
  - \* 2. Field trips and/or field assignments
  - \* 3. Laboratory assignments utilizing specifically planned instructional activities or "live" work.

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

Textbooks may include, but are not limited to:

### **TEXTBOOKS:**

1. Brady, Robert N.. Heavy Duty Trucks and Power Train Systems and Services, 1st ed. Prentice-Hall, 1997, ISBN: 0131814702
2. Vickers, Inc.. Vicker's Mobile Hydraulics Manual, 1st ed. Vickers, 1998, ISBN: 0963416251

### **MANUALS:**

### **PERIODICALS:**

### **SOFTWARE:**

### **SUPPLIES:**

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

**ORIGINATOR:** Jim Lewis  
**ORIGINATION DATE:** 08/31/1994  
**PROPOSAL ORIGINATOR:** James Cargill  
**CO-CONTRIBUTOR(S)**

**PROPOSAL DATE: 02/28/2002**