

CATALOG INFORMATION

Dept and Nbr: DET 188                      Title: HEAVY-DUTY POWER TRAIN  
Full Title: Heavy-Duty Power Train  
Last Reviewed: 1/22/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.25	17.5	Lecture Scheduled	39.38
Minimum	3.00	Lab Scheduled	2.25	8	Lab Scheduled	39.38
		Contact DHR	0		Contact DHR	0
		Contact Total	4.50		Contact Total	78.75
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 78.75

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable  
Grading: Grade Only  
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP  
Also Listed As: AGMEC 88  
Formerly: DET 88

**Catalog Description:**  
In depth study of heavy duty drivetrain. Course covers theory, operation, diagnosis, service and overhaul of clutches, manual transmissions and rear axle assemblies.

**Prerequisites/Corequisites:**

**Recommended Preparation:**  
Eligibility for ENGL 100 or ESL 100 and Course Completion or Concurrent Enrollment in DET 179

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: In depth study of heavy duty drivetrain. Course covers theory, operation, diagnosis, service and overhaul of clutches, manual transmissions and rear axle assemblies. (Grade Only)  
Prerequisites/Corequisites:  
Recommended: Eligibility for ENGL 100 or ESL 100 and Course Completion or Concurrent Enrollment in DET 179  
Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:

<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
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<b>CSU Transfer:</b>	Effective:	Inactive:
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<b>UC Transfer:</b>	Effective:	Inactive:
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**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

### **Outcomes and Objectives:**

Upon successful completion of this course students will be able to:

1. Explain the operation of, evaluate and perform repairs on the following components:
  - a. clutches
  - b. manual transmissions
  - c. automatic transmissions
  - d. drivelines
  - e. differentials and final drives
  - f. electronic transmission controls
2. Use technical references properly, including repair and parts manuals.
3. Discuss and apply personal, shop, and environmental safety procedures.

### **Topics and Scope:**

1. Power Transmission
  - a. power transmission theory
  - b. system operation
  - c. system components
2. Clutches
  - a. single disc clutches
  - b. twin disc clutches
  - c. clutch controls
  - d. torque converters
3. Manual Transmissions
  - a. gear identification
  - b. gear ratios
  - c. single countershaft transmissions
  - d. twin countershaft transmissions
4. Automatic Transmissions
  - a. torque converters

- b. operation principles
  - c. shift control
- 5. Driveshaft Assemblies
  - a. universal joints
  - b. drive shafts
  - c. drive line angles
- 6. Differentials and Final Drives
  - a. single speed differentials
  - b. multi-speed differentials
  - c. differential locking devices
  - d. simple and planetary final drives
- 7. Power train service, diagnosis, and repair
  - a. Repair and parts manuals
- 8. Safety
  - a. personal
  - b. shop
  - c. environmental

### Assignment:

1. Read 40 pages a week
2. Inspect and adjust clutch assemblies
3. Disassemble, inspect and reassemble a single counter shaft transmission and complete a written report
4. Disassemble, inspect and reassemble a twin counter shaft transmission and complete a written report
5. Disassemble, inspect and adjust a final drive assembly and complete a written report
6. 3-5 exams

### Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Transmission and final drive reports
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Writing 0 - 20%
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**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Transmission inspection and assembly
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Problem solving 20 - 35%
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**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Clutch inspection, Final drive adjustments
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Skill Demonstrations 20 - 35%
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**Exams:** All forms of formal testing, other than skill performance exams.

Exams

Exams  
30 - 50%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

None

Other Category  
0 - 0%

**Representative Textbooks and Materials:**

Heavy Duty Truck Systems, Sean Bennett, Delmar Learning. 5th edition, 2011