Course Information Form (CIF)

Course Code: AFM 112

Course Title: Manual Transmission and Drivetrains

Department: Applied Sciences and Technologies
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 47.0604
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 3-3-4
Credit Hour Distribution:

Lecture: 3	Lab: 3	Clinical: 0	**Total: 4**

General Course Information

Catalog Description

Component parts and principles employed in the transference of power from engine to drive axles; clutches, manual transmission, transaxles, axles, differentials, propeller shafts, drive axle suspensions. Students who successfully complete this course may receive current certification from Ford Motor Company in 1) Manual Transmission and Transaxle Diagnosis, and 2) Differential and Four-Wheel Drive Systems Diagnosis and Repair.

General Course Objectives

Students will become familiar with and be able to rebuild major power train components.

Minimum Placement Levels

English	Reading	Math
Placement into ENG 098	Placement into CCS 098	Placement into MAT 059

Prerequisites

None

Methods of Evaluation

Students will have a minimum of 4 quizzes, 22 lab exercises, 5 web courses, 2 lab practical exams, and 2 Ford Certification exams.

Instructional Materials and Additional Supplies

Automotive Technology, Erjavec, Thompson Delmar Learning. ISBN 9781337794213

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.
- Technology: Students will demonstrate the ability to evaluate, select, and appropriately use current and emerging tools.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Power Train Components	1. Identify and describe the function of: 1. Flywheel 2. Clutch 3. Transmission 4. Drive line 5. Drive shaft 6. Universal (U) joint 7. Final drive 8. Differential 9. Slip yoke 10. Transaxle 11. Power train 2. Demonstrate an understanding of how to raise a vehicle on a hoist.	3	3	0
Drive Lines	1. Explain the operation of: 1. Slip yoke 2. Universal joint 3. Drive shaft 2. Constant velocity (CV) joint 3. Balance a drive shaft. 4. Rebuild a U-joint.	3	3	0
Five-Speed Transmissions	1. Identify four functions of manual-shift transmissions. 2. Describe how torque speed and direction are varied in a set of gears. 3. Determine gear ratios and work problems finding gear torque and speed transfer. 4. Disassemble, inspect, and reassemble a five-speed fully-synchronized constant mesh transmission.	12	8	0
Five-Speed Transaxles	1. Identify four functions of manual-shift transaxles. 2. Describe how torque speed and direction are varied in a set of gears. 3. Determine gear ratios and work problems finding gear torque and speed transfer. 4. Disassemble, inspect, and reassemble a five-speed fully-synchronized constant mesh transaxle.	3	3	0
Two-Speed Transfer Case	1. Demonstrate and describe power flow through two types of two-speed 4x4 Borg Warner 4405 and 4406 transfer cases.	3	3	0
Flywheel Clutches	1. Define and describe components and operation of a flywheel clutch. 2. Overhaul and adjust a flywheel clutch. 3. Examine a dual mass flywheel.	3	5	0
Rear Axles and Final Drives	1. Describe components and functions of drive axles. 2. Describe operation of a differential assembly. 3. Describe operation of limited slip differentials.	3	5	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Drive Axle Service	1. Disassemble, inspect, and reassemble an integral rear axle assembly. 2. Disassemble, inspect, and reassemble a non-integral (removable carrier) rear axle assembly. 3. Service drive axle bearings and hubs.	3	6	0
Four-Wheel Drive	1. Describe two types of four-wheel drive systems. 2. Describe operation of a simple planetary gear set. 3. Examine and describe power flow in a typical transfer case. 4. Describe operation of lock-out-hubs.	3	1	0
Front Wheel Drive (FWD)	1. Examine FWD transaxle. 2. Examine drive line and CV joints on FWD.	8	8	0
Power Take-Off Units (PTU)	1. Describe components and operations of PTU.	1	0	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	45	0