

Course Code: AFM 153

Course Title: Brakes and Anti-Lock Brake Systems (ABS)

Department: Applied Sciences and Technologies

Effective Date: Summer 2026

PCS Code: 1.2 - Occupational/Technical Instruction

CIP Code: 47.0604

Repeatability: 0

Credit Hours

Catalog Notation: 3-2-4

Credit Hour Distribution:

Lecture: 3

Lab: 2

Clinical: 0

Total: 4

General Course Information

Catalog Description

Automotive braking and stability control system theory of operation, inspection, and service. Students who successfully complete this course may receive credit for Brake System Diagnosis and Repair and Advanced Brake System Diagnosis and Service from Ford Motor Company.

General Course Objectives

Students will identify components and systems found in modern automotive and light truck brakes, develop skills and procedures for overhaul and service of brake systems, and develop diagnosis skills in brake troubleshooting.

Minimum Placement Levels

English	Reading	Math
Placement into ENG 098	Placement into CCS 098	Placement into MAT 060

Prerequisites

None

Methods of Evaluation

The minimum number of evaluation methods include: 4 quizzes, 20 lab exercises, 5 web courses, 2 lab practical exams, and 2 Ford certification exams.

Instructional Materials and Additional Supplies

- Global Fundamentals, Brake Systems, Ford Motor Company
- Automotive Technology, Erjavec, Thompson Delmar Learning

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
Safety and Liability	1. Identify safety concerns to vehicles, operators, passengers, and property. 2. Discuss the responsibility and liability of mechanics with regard to their workmanship. 3. Discuss quality workmanship and trade standards.	1	0	0
Reline and Overhaul of Drum Brakes	1. Identify all parts of rear brake assemblies: a) duo servo, b) leading-trailing, and c) disc. 2. Disassemble, clean, inspect, and reassemble rear brakes: a) duo servo, b) leading-trailing, and c) disc. 3. Properly adjust brakes. 4. Free up and adjust cable-type parking brake.	3	2	0
Fundamental Science of Brakes	1. Describe function and energy conversion. 2. Describe the coefficient of friction and factors affecting it. 3. Describe heat dissipation characteristics of drums and linings. 4. Describe operating mechanics of: a) servo action, and b) self-energizing action.	10	0	0
Wheel Bearings	1. Remove, repack, and reinstall complete wheel bearing assemblies. 2. Repack and adjust bearings. 3. Describe correct greases and applications. 4. Describe correct wheel lug and bearing torque procedures.	1	1	0
Tools and Equipment	1. Select correct hand and power tools for brake work. 2. Set up on-car lathe for rotors. 3. Measure drums and rotors with appropriate precision equipment. 4. Correctly use power bleeding equipment.	3	3	0
Hydraulics	1. Describe basic hydraulic principles of static fluid power: a) Pascal's Law, b) pressure multiplication, and c) power transfer. 2. Describe single and dual master cylinder operation. 3. Describe operation of control valves: a) Metering, b) proportioning, and c) pressure differential. 4. Rebuild master cylinder. 5. Rebuild wheel cylinder. 6. Bleed and flush system: a) Manual method, b) power method, and c) sequence for bleeding each wheel. 7. Describe operation of cross-diagonal hydraulic systems. 8. Describe how to bleed cross-diagonal hydraulic systems.	6	1	0
Complete Drum Brake Overhaul	1. Perform complete brake job: a) reline, b) turn drums, c) rebuild wheel cylinders as needed, d) repack bearings, e) bleed system, f) adjust all brakes and parking brake, and g) road test with instructor.	0	10	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Disc Brakes	1. Describe basic caliper operation. 2. Describe rotor design and structure: a) hubless, b) ventilated, and c) solid. 3. Remove caliper, service the sliding mechanism, and reline. 4. Rebuild disc caliper. 5. Describe and perform special bleeding procedures. 6. Inspect and measure rotor for: a) minimum thickness, b) parallelism, c) runout, and d) taper variation.	4	6	0
Antilock Brake Systems	1. Describe theory of ABS operation. 2. Identify components of ABS. 3. Examine and service ABS as available.	10	5	0
Wheel Balance	1. Describe theory of static and dynamic balance. 2. Measure tires and wheels for lateral and radial runout. 3. Balance wheel of the car on Hunter dynamic balancer.	3	1	0
Stability Control Systems	1. Describe the operation of Ford electronic stability control (ESC) systems.	4	1	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	30	0