Course Information Form (CIF)

Course Code: AFD 113

Course Title: Automotive Chassis Systems Maintenance and Light Repair

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: 5-5-7
Credit Hour Distribution:

Lecture: 5	Lab: 5	Clinical: 0	**Total: 7**

General Course Information

Catalog Description

Automotive brake and steering system theory of operation, inspection and service. Emphasis placed on inspection and repair as a maintenance and light repair (MLR) technician.

General Course Objectives

Students will obtain the skills needed to inspect and service the chassis component of a vehicle, including drum and disc brakes, steering and suspension components, and wheel alignment.

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 will include: 2 practical exams (rotor inspection and measurement; tire mount and balance), 8 quizzes, and 2 exams.

Instructional Materials and Additional Supplies

Revel For Automotive Technology: Principles, Diagnosis And Service Access Card (6e), 9780135580066

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.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Automotive Safety as Related to Chassis Maintenance and Light Repair	1. Identify the safety concerns related to automotive chassis service.	2	0	0
Automotive Tire Service, Repair, and Balancing	1. Rotate tires according to manufacturer's recommendations. 2. Dismount, inspect, and re-mount tire on wheel; balance wheel and tire assembly (static and dynamic). 3. Dismount, inspect, and re-mount tire on wheel equipped with tire pressure monitoring system sensor. 4. Repair tire using internal patch. 5. Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system.	9	26	0
Automotive Steering and Suspension Systems	1. Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins. 2. Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots. 3. Inspect pitman arm, relay (center link/intermediate) rod, idler arm and mountings, and steering linkage damper. 4. Inspect tie rod ends (sockets), tie rod sleeves, and clamps. 5. Inspect upper and lower control arms, bushings, and shafts. 6. Inspect and replace rebound and jounce bumpers. 7. Inspect track bar, strut rods/radius arms, and related mounts and bushings. 8. Inspect upper and lower ball joints (with or without wear indicators). 9. Inspect suspension system coil springs and spring insulators (silencers). 10. Inspect suspension system torsion bars and mounts. 11. Inspect and replace front stabilizer bar (sway bar) bushings, brackets, and links. 12. Inspect strut cartridge or assembly. 13. Inspect front strut bearing and mount. 14. Inspect rear suspension system lateral links/arms (track bars) and control (trailing) arms. 15. Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts. 16. Inspect, remove, and replace shock absorbers; inspect mounts and bushings. 17. Inspect electric power-assisted steering. 18. Inspect tire condition and tire wear patterns; check for correct size and application (load and speed ratings), and adjust air pressure; determine necessary action. 19. Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS). 20. Install wheel and torque lug nuts.	14	17	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Automotive Steering Systems Operation, Maintenance, and Light Repair	1. Disable and enable supplemental restraint system (SRS). 2. Verify indicator lamp operation. 3. Remove and replace steering wheel. 4. Center/time SRS coil (clock spring).	6	0	0
Power Steering Systems Service	1. Flush, fill, and bleed power steering systems. 2. Remove, inspect, replace, and adjust power steering pump drive belt. 3. Inspect and replace power steering hoses and fittings. 4. Identify hybrid vehicle power steering system electrical circuits and safety precautions. 5. Describe the function of the power steering pressure switch.	4	4	0
Automotive Alignment Theory and Procedure	1. Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine needed action. 2. Perform pre-alignment inspection, determine vehicle ride height, and determine needed action. 3. Prepare vehicle for wheel alignment on alignment machine. 4. Perform four-wheel alignment by checking and adjusting front and rear wheel caster, camber, and toe as required. 5. Center steering wheel.	7	0	0
Automotive Brake System Theory, Operation, Maintenance, and Light Repair	1. Discuss hydraulic theory and Pascal's Law. 2. Perform calculations to anticipate force exerted at brake components. 3. Review Federal Motor Vehicle Safety Standards (FMVSS) rules and regulations surrounding braking systems. 4. Discuss the various types of brake lining compounds and configurations. 5. Identify the proper type of brake lining for a specific vehicle application.	11	0	0
Automotive Brake Systems	1. Measure brake pedal height, travel, and free play (as applicable); determine necessary action. 2. Check master cylinder for external leaks and proper operation. 3. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, loose fittings and supports; determine necessary action. 4. Identify components of brake warning light system. 5. Check brake pedal travel with and without engine running to verify proper power booster operation. 6. Test brake fluid for contamination. 7. Check parking brake cables and components for wear, binding, and corrosion; clean, lubricate, adjust or replace as needed.	14	6	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Automotive Disc Brake Operation, Inspection, and Service	1. Remove and clean caliper assembly; inspect for leaks and damage/wear to caliper housing; determine necessary action. 2. Clean and inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine necessary action. 3. Remove, inspect, and replace pads and retaining hardware; determine necessary action. 4. Lubricate and reinstall caliper, pads, and related hardware; seal pads and inspect for leaks. 5. Clean and inspect rotor; measure rotor thickness, thickness variation, and lateral runout; determine necessary action. 6. Remove and reinstall rotor. 7. Refinish rotor on vehicle; measure final rotor thickness and compare with specifications. 8. Refinish rotor off vehicle; measure final rotor thickness and compare with specifications. 9. Retract and readjust caliper piston on an integral parking brake system. 10. Check brake pad wear indicator; determine necessary action. 11. Describe importance of operating vehicle to burnish/break in replacement brake pads according to manufacturer's recommendations. 12. Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster. 13. Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings. 14. Replace wheel bearing and race. 15. Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.	4	12	0
Drum Brake Operation, Inspection, and Service	1. Bleed and/or flush brake system. 2. Remove, clean, inspect, and measure brake drum diameter; determine necessary action. 3. Refinish brake drum and measure final drum diameter; compare with specifications. 4. Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and re-assemble. 5. Inspect wheel cylinders for leaks and proper operation; remove and replace as needed. 6. Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; make final checks and adjustments.	4	10	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
75	75	0