Course Information Form (CIF)

Course Code: ACR 154

Course Title: Collision Repair Mechanical Analysis

Department: Applied Sciences and Technologies
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 47.0603
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 2-2-3
Credit Hour Distribution:

Lecture: 2	Lab: 2	Clinical: 0	**Total: 3**

General Course Information

Catalog Description

Theory and repair of mechanical systems most often affected by collisions; includes steering, suspension, wheel alignment, brakes, air conditioning, and cooling systems.

General Course Objectives

Students will learn how to make repairs on mechanical systems most often affected by collisions.

Minimum Placement Levels

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

Prerequisites

Credit in ACR 110

Methods of Evaluation

The minimum evaluation tools will be: 5 written exams, 15 graded assignments, 3 lab worksheets, and 2 practical exams.

Instructional Materials and Additional Supplies

Auto Collision Repair and Refinishing, Michael Crandell

Course Content

General Learning Outcomes (GLOs)

- 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
Mechanical System Damage Inspection and Repair Planning	1. Inspect vehicles for collision repair damage. 2. Compare repair plan to OEM repair procedures. 3. Identify conflicts between repair plan and OEM procedures.	2	2	0
Brake Operation and Service	1. Apply knowledge of brake system operation. 2. Inspect, remove, and replace drum brake system parts. 3. Inspect, remove, and replace disk brake system parts. 4. Bleed, purge, and pressure test brake system. 5. Inspect, remove, replace, and adjust parking brake system. 6. Apply knowledge of anti-lock brake system operation. 7. Inspect, remove, and replace anti-lock brake system parts.	10	10	0
Steering, Suspension, Operation, and Service	1. Apply knowledge of various types of steering systems and steering problems. 2. Diagnose and service power steering systems. 3. Diagnose and service rack and pinion steering systems. 4. Diagnose and service parallelogram steering systems. 5. Diagnose and service steering column damage. 6. Apply knowledge of alignment angles and measurements. 7. Diagnose and service strut type front suspension systems. 8. Diagnose and service short arm/long arm front suspension systems. 9. Remove, replace, and align front and rear frame cradles and sub-assemblies. 10. Identify steering axis inclination (SAI), king pin inclination (KPI), and included angle-related problems; diagnose and complete repair. 11. Inspect and check tires and wheels for wear and roundout; diagnose and complete repairs. 12. Check and adjust front wheel toe and center steering wheel. 13. Diagnose and service rear suspension systems. 14. Diagnose rear wheel camber, toe, and thrust angle related problems, and complete repairs. 15. Diagnose and service rear axle assembly damage and misalignment. 16. Diagnose and service air shock absorbers, load-leveling devices, air springs, and associated lines and fittings. 17. Diagnose and service electronically-controlled suspension systems. 18. Remove and reinstall wheels and torque lug nuts.	10	10	0
Cooling System Operation and Service	1. Inspect and replace cooling and heating system hoses and belts. 2. Remove and replace radiator, pressure cap, coolant recovery system, and water pump. 3. Remove and replace thermostat, by-pass, and housing. 4. Recover, refill, bleed, and leak-test cooling system, and test level of protection. 5. Remove and replace fan, fan pulley, fan clutch, and fan shroud. 6. Remove and replace auxiliary oil coolers and check oil level. 7. Inspect, remove, and replace fan sensors and check operation.	4	4	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Air Conditioning Operation and Service	1. Apply knowledge of air conditioning theory of modern refrigerant systems. 2. Identify, recover, label, store, and recycle refrigerant from A/C systems. 3. Operate and maintain certified A/C equipment. 4. Inspect, remove, replace, and repair A/C system components. 5. Evacuate A/C system and check for leaks. 6. Identify oil type in A/C system, check level, and add correct amount. 7. Recharge A/C system and check for leaks. 8. Diagnose air conditioning system problems. 9. Inspect, test, and repair heating, ventilating, and A/C ducts, doors, hoses, and outlets.	4	4	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
30	30	0