AUTO COLLISION DAMAGE ANALYSIS
Course Syllabus

Course Number: DAE-0397
OCAS Code: None
Course Length: 75 Hours
Career Cluster: Transportation, Distribution, and Logistics
Career Pathway: Automotive Collision Repair
Career Major(s): Collision Repair Technician

Pre-requisite(s):

Course Description:
Within this course the students will learn to inspect a damaged vehicle and correctly identify all damage. This damage analysis will cover the entire vehicle from minor to major damage with structural misalignment. This course will cover the different types of vehicle construction found on the road today, such as uni-body, full body-over-frame frame and the hybrid frame/semi-unibody. Students will learn to look for indicators of damage and how collision energy is managed and travels through a vehicle during a collision. Some of the measuring equipment that will be covered is the centerline gauge, tram bar, universal measuring system and computer measuring systems. Measuring of the vehicle structure will be covered with the students learning to set-up and analyze the measurements to determine damage. The students will learn to look at damage in 3-Dimension, which are length, width and height.

Textbooks:

Course Objectives:

A. Practice Using Measuring Instruments and Analyzing Damage
1. Describe the two basic systems of measurement used in the United States.
2. Match the basic units of measurement to each system.
3. Define prefixes used in the metric system.
4. Use a ruler and make accurate measurements.
5. Use a tram gauge.
6. Differentiate between a tram and self-centering gages.
7. Use a laser measuring system.
8. Use a computer measuring system.
9. Use a wheel alignment gauge.
10. Use hydrometer and report readings.
11. Use a torque wrench.
12. Use a tire pressure gauge.
13. State terms and definitions used in estimating damages.
14. Identify vehicle parts related to the correct auto body nomenclature.
15. Identify and list direct damages.
16. Identify and list indirect damages.
17. Decode VIN codes and related body plates.
18. Set-up and analyze the measurements to determine damage.
19. Use a centerline gauge, tram bar, universal measuring system and computer measuring system.
20. Look at damage in 3-Dimensions. (length, width and height)
B. Complete Manual Damage Reports.  
1. Find specific information in shop manuals, estimating guides, or collision damage guides.  
2. Use collision parts manuals to find the price of new parts.  
3. Tabulate labor time for assignment jobs using a flat rate.  
4. Use a microfiche system for estimating repairs.  
5. Determine overlap and additional operations.  
6. Compute materials, labor and taxes in a repair estimate.  

C. Analyze Damage and Prepare Vehicle  
1. Identify types of automotive sheet metal.  
2. Discuss the effects of bending body sheet metal.  
3. Determine the extent of direct and indirect damage, the direction of impact; develop and document a repair plan. (HP-I)  
4. Review damage report, and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan. (HP-I)  
5. Identify metal straightening techniques.  
6. Describe metal working techniques.  

D. Diagnosing Major Collision Damage (Frame)  
1. Determine impact and its effect on a vehicle.  
2. Discuss impact effect on unibody vehicle.  
3. Determine and inspect the locations of all suspension, steering, and powertrain component attaching points on the vehicle. (HP-G)  
4. Measure vehicle body dimension.  
5. Identify and explain gauge measuring systems.  
6. Perform tram gauge measurement.  
7. Install centering gauges.  
8. Install strut centerline gauge.  
9. Diagnose and measure structural damage using tram and self-centering gauges. (HP-I)  
10. Diagnose and measure unibody damage using tram and self-centering gauges. (HP-I)  
11. Attach vehicle to anchoring device. (HP-I)  
12. Discuss and use universal and laser measuring system.  
13. Identify dedicated bench and fixture measuring system.  
14. Analyze and identify misaligned or damaged steering, suspension, and powertrain components, that can cause vibration, steering, and chassis alignment problems. (HP-I)  
15. Diagnose and measure unibody vehicles using a dedicated (fixture) measuring system. (HP-G)  
16. Diagnose and measure structural damage to vehicles using a dedicated (fixture) measuring system. (HP-G)  
18. Diagnose and measure structural damage using a universal measuring system (mechanical, electrical, laser) (HP-G)  
19. Determine the extent of the direct and indirect damage, and the direction of impact; document the methods and sequence of repairs. (HP-I)  
20. Determine the extent of damage to structural steel body panels; repair or replace. (HP-I)  
21. Analyze and Identify crush/collapse zones. (HP-1)  
22. Realign or replace misaligned or damaged steering, suspension, and power
train components that can cause vibration, steering and chassis alignment problems. (HP-G)  
23. Determine the proper metal finishing techniques for aluminum. (HP-G)  
24. Determine proper application of body filler to aluminum. (HP-G)  
25. Identify the types of plastics; determine repairability. (HP-I)  
26. Identify the types of plastic repair procedures; clean and prepare the surface of plastic parts. (HP-I)  
27. Replace or repair rigid, semi-rigid, and flexible plastic panels. (HP-G)  
28. Remove or repair damaged areas from rigid exterior composite panels. (HP-G)  
29. Replace bonded rigid exterior composite body panels; straighten or align panel supports. (HP-G)  

\(^1\)ASE objective  
All unmarked objectives are TTC instructor developed.

**Teaching Methods:** The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

**Grading Procedures:**  
1. Students are graded on theory and shop practice and performance.  
2. Each course must be passed with seventy (70%) percent or better.  
3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

**Description of Classroom, Laboratories, and Equipment:** Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

**Available Certifications/College Credit**  
The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

**College Credit Eligibility:** The student must maintain a grade point average of 2.0 or better.