# Scope & Sequence

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| Course Name: Collision Repair **TSDS PEIMS Code:** 13039800 | | | **Course Credit:** 2.0  **Course Requirements:** Recommended Grade Placement: 10 – 12.  **Prerequisites:** None.  **Recommended Prerequisites:** Basic Collision Repair and Refinishing. |
| **Course Description:** Collision Repair includes knowledge of the processes, technologies, and materials used in the reconstruction of vehicles. This course is designed to teach the concepts and theory of systems related to automotive collision repair and refinishing. | | | |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. | | | |
| **Total Number of Periods**  **Total Number of Minutes**  **Total Number of Hours** | 350 Periods  15,750 Minutes  262.50 Hours\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. | |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***  (assumes 45-minute periods)  Total minutes per unit | **TEKS Covered**  **130.456. (c) Knowledge and skills** | |
| **Unit 1: Career Exploration**  Students will identify employment and entrepreneurship opportunities in the field of automotive collision repair. Students will be encouraged to discover and use resources available through Career and Technology Student Organizations (CTSO) or other extracurricular organization(s) to further develop leadership and employability skills. Students will discuss and demonstrate appropriate and effective group participation, leadership, teamwork and good citizenship in this and in all units as they develop personal and career goals and increase their interpersonal skills. Students will explore and discuss industry certification opportunities and requirements and include relevant information as they continue to develop their plans for future career opportunities. | 10 periods  450 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (B) identify employment opportunities, including entrepreneurship opportunities, and certification requirements for the fields of collision repair;  (C) demonstrate the principles of group participation and leadership related to citizenship and career preparation; and  (E) review the competencies related to resources, information systems, and technology. | |
| **Unit 2: Health and Safety**  Students will discuss and identify employers’ expectations regarding safe and appropriate work habits, ethical conduct and decision-making and environmental responsibilities in collision repair. Students will participate as a class and/or in small groups to model, present and discuss various workplace safety scenarios and situations where personal protective equipment must be worn and/or decisions regarding safety and/or ethics must be made. Students will also have the opportunity to observe and identify proper welding and cutting techniques and processes used in collision repair as well as properly handle and dispose of environmentally hazardous materials used in collision repair and refinishing technologies. | 40 periods  1,800 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) demonstrate an understanding of workplace safety and environmental responsibilities regarding automotive collision repair and understand the use of personal protective equipment;  (C) demonstrate the principles of group participation and leadership related to citizenship and career preparation;  (D) identify employers' expectations and appropriate work habits; and  (F) apply reasoning skills to a variety of workplace situations in order to make ethical decisions.  (4) The student knows the function and application of tools, equipment, technologies, and materials used in collision repair. The student is expected to:  (A) use hand and power tools and equipment commonly employed in collision repair, according to industry safety standards;  (B) identify proper welding and cutting techniques and processes in collision repair; and  (C) properly handle and dispose of environmentally hazardous materials used in collision repair and refinishing technologies. | |
| **Unit 3: Academics in Automotive Collision and Repair**  Students will explore, discuss and describe the function and application of tools, equipment, technologies and materials used in collision repair. Students will be given multiple opportunities to describe, demonstrate and apply relevant problem-solving, reading, writing and mathematical skills in-context as they read and interpret service and repair information, technical bulletins, specifications, schematics and parts catalogs from a variety of sources. Students will discuss and predict new and emerging collision repair technologies and materials as well as what core academic skills will be necessary for a successful career in the fields of automotive collision repair and refinishing. | 20 periods  900 minutes | (2) The student relates core academic skills to the requirements of collision repair. The student is expected to:  (A) apply effective oral and written communication skills with individuals from various cultures such as fellow workers, management, and customers;  (B) use technical writing skills to complete collision repair orders and related paperwork;  (C) locate, read, and interpret documents such as service and repair information, technical bulletins, specifications, schematics, and parts catalogs; and  (D) apply mathematical skills to the estimating process such as establishing charges and totals, profit margins, technician productivity, and shop efficiency.  (4) The student knows the function and application of tools, equipment, technologies, and materials used in collision repair. The student is expected to:  (D) demonstrate knowledge of new and emerging collision repair. | |
| **Unit 4: Tools, Equipment and Materials**  Students will continue to discuss and safely demonstrate the use of tools, equipment and materials used in automotive collision repair and refinishing. Students will be given multiple opportunities for “hands-on” presentations, discussions and demonstrations of the proper ways to perform audits and inspections as well as multiple opportunities to identify types of vehicle construction materials, vehicle occupant restraint systems, finishes, components and their associated repair/ replace methods. Students will also learn and demonstrate the welding and cutting processes used in vehicle collision repair. | 45 periods  2,025 minutes | (5) The student applies the technical knowledge and skills of collision repair and refinishing to simulated or actual work situations. The student is expected to:  (A) perform regular audits and inspections to maintain compliance with safety, health, and environmental regulations;  (B) identify types of vehicle construction materials and associated repair methods;  (C) identify methods of collision energy management and types of damage;  (G) identify types of vehicle finishes and associated refinish techniques;  (I) identify vehicle occupant restraint systems and associated repair methods;  (J) identify vehicle body components and assess for repair or replacement; and  (K) demonstrate the welding and cutting processes used in vehicle collision repair. | |
| **Unit 5: Repair and Preparation Procedures**  Students will be given multiple opportunities to learn, practice and demonstrate their technical knowledge, skills, and understanding of repair methods and procedures in “hands-on” activities, presentations, discussions and inspections in simulated or actual automotive collision repair work situations. Students will also be given multiple “hands-on” opportunities to demonstrate their understanding of damage determinations, vehicle construction materials and pre-repair and repair inspections. | 50 periods  2,250 minutes | (3) The student understands the technical knowledge and skills of collision repair. The student is expected to:  (A) demonstrate an understanding of basic types of repair procedures for the different types of vehicle body construction used in the auto collision industry;  (B) demonstrate an understanding of pre-repair and repair inspection of non-damaged components;  (C) demonstrate the proper preparation, application, and refinishing of various paint products; and  (E) perform precision measurements to diagnose vehicle body shape and frame alignment angles.  (5) The student applies the technical knowledge and skills of collision repair and refinishing to simulated or actual work situations. The student is expected to:  (B) identify types of vehicle construction materials and associated repair methods;  (E) determine body panel damage and identify the associated repair methods, including inspection, disassembly, and repair or replacement of components;  (F) inspect, remove, replace, and align various body components such as hoods, hinges, latches, and bumper covers;  (H) inspect, remove, and replace bolted, bonded, and welded panels or panel assemblies;  (J) identify vehicle body components and assess for repair or replacement;  (L) remove, install, and adjust vehicle mechanical systems and electrical components;  (M) identify and determine the cause of paint and refinishing defects;  (N) discuss interior and exterior trim repair;  (R) restore sound deadeners and foam materials; and  (S) diagnose and repair water leaks, dust leaks, and wind noise. | |
| **Unit 7: Repairs**  Students will continue to be given multiple opportunities to demonstrate the safe and appropriate use of various tools and inspection and repair procedures with “hands-on” activities, demonstrations, presentations, discussions, damage analysis, and visual inspections and measurements. Some or all of the opportunities will be given in simulated or actual occupational tasks and work situations. Students will also explain and safely demonstrate hammer and dolly techniques, paint removal, metal finishing, body filling and other collision repair procedures. | 50 periods  2,250 minutes | (6) The student applies the technical knowledge and skills of metal finishing and body filling to simulated or actual work situations. The student is expected to:  (A) remove paint from damaged area of a body panel;  (B) identify and repair surface irregularities on a damaged body panel;  (C) demonstrate hammer and dolly techniques for dent repair;  (D) heat shrink stretched panel areas to proper contour;  (E) cold shrink stretched panel areas to proper contour;  (F) identify, prepare, and apply body filler;  (G) rough sand body filler to contour panel and finish sand for the application of primer;  (H) determine the proper metal finishing techniques for aluminum; and  (I) determine the proper application of body filler to aluminum.  (9) The student applies the technical knowledge and skills of damage analysis to simulated or actual work situations. The student is expected to:  (A) prepare vehicle for inspection by providing access to damaged areas;  (B) analyze damage to determine appropriate methods for overall repairs;  (C) perform visual inspection of structural components and members;  (D) identify structural damage using measuring tools and equipment;  (E) perform visual inspection of non-structural components and members;  (F) determine parts, components, material type(s), and procedures necessary for a proper repair;  (G) identify type and condition of finish and determine if refinishing is required;  (H) identify suspension, electrical, and mechanical component physical damage;  (I) identify safety systems physical damage;  (J) identify interior component damage;  (K) identify damage to add-on accessories and modifications; and  (L) identify single/one-time use components. | |
| **Glass, Plastics, and Adhesives**  Students will be given multiple opportunities to practice and demonstrate inspecting, adjusting, repairing and replacing moveable glass and hardware as well as plastics and adhesives in “hands-on” activities, demonstrations, presentations and discussions. Students will safely perform these activities as well as discuss and identify the types of plastics used in automotive applications and how to clean, repair, remove and replace them in simulated or actual work situations. | 45 periods  2,025 minutes | (7) The student applies the technical knowledge and skills of moveable glass and hardware to simulated or actual work situations. The student is expected to:  (A) inspect, adjust, repair, or replace window systems such as regulators, run channels, glass, power mechanisms, and related controls;  (B) inspect, adjust, remove, repair, or reinstall body sealing systems such as weather stripping;  (C) inspect, adjust, repair, or replace regulators, run channels, glass, power mechanisms, and related controls for roof panel options such as sun roofs and convertible tops; and  (D) inspect, remove, reinstall, and align convertible tops and related mechanisms.  (8) The student applies the technical knowledge and skills of plastics and adhesives to simulated or actual work situations. The student is expected to:  (A) identify the types of plastics used in automotive applications;  (B) clean and prepare the surface of plastic parts;  (C) repair rigid, semi-rigid, or flexible plastic panels;  (D) remove or repair damaged areas from rigid exterior composite panels; and  (E) replace bonded rigid exterior composite body panels, including straightening or aligning panel supports. | |
| **Unit 8: Painting and Refinishing**  Students will be given multiple opportunities to practice and demonstrate proper preparation, application, detailing and refinishing with various paint products in “hands-on” activities, demonstrations, presentations, and discussions. Students will perform these activities as well as discuss exterior trim repair, corrosion protection and identify defects in simulated or actual work situations. | 50 periods  2,250 minutes | (5) The student applies the technical knowledge and skills of collision repair and refinishing to simulated or actual work situations. The student is expected to:  (G) identify types of vehicle finishes and associated refinish techniques;  (M) identify and determine the cause of paint and refinishing defects;  (N) discuss interior and exterior trim repair;  (O) discuss corrosion protection, including sealers, adhesives, and under-coatings;  (P) prepare damaged area using water-based and solvent-based cleaners; and  (Q) demonstrate vehicle detailing. | |
| **Unit 9: Parts, Costs, and Paperwork**  Students will be given multiple opportunities to learn and demonstrate the procedures for determining damage and estimating parts and labor costs on collision repair and refinishing orders in simulated and/or actual work situations. Students will also identify and apply the preparation, technical writing and mathematical skills necessary to complete paperwork associated with various customer service scenarios in automotive collision services. | 20 periods  900 minutes | (2) The student relates core academic skills to the requirements of collision repair. The student is expected to:  (A) apply effective oral and written communication skills with individuals from various cultures such as fellow workers, management, and customers;  (B) use technical writing skills to complete collision repair orders and related paperwork;  (C) locate, read, and interpret documents such as service and repair information, technical bulletins, specifications, schematics, and parts catalogs; and  (D) apply mathematical skills to the estimating process such as establishing charges and totals, profit margins, technician productivity, and shop efficiency.  (3) The student understands the technical knowledge and skills of collision repair. The student is expected to:  (D) estimate parts and labor costs of collision repair.  (5) The student applies the technical knowledge and skills of collision repair and refinishing to simulated or actual work situations. The student is expected to:  (D) determine vehicle damage and prepare an estimate of the repair costs. | |
| **Unit 10: Collision Repair Course Culmination Activities**  Students will demonstrate and apply their technical knowledge and mathematical skills in various simulated occupational tasks, workplace scenarios and culminating activities that also demonstrate appropriate workplace safety and conduct. Culminating activities will include a demonstration of locating and recording appropriate owner and vehicle information, appropriate estimating procedures, terminology and sequence, and an estimation of time and labor, parts, prices, materials and allowances or fees. As part of these activities and scenarios, students will also demonstrate effective communication skills with individuals from various cultures such as fellow workers, management and customers, as well as effective group participation and leadership skills. | 20 periods  900 minutes | (2) The student relates core academic skills to the requirements of collision repair. The student is expected to:  (A) apply effective oral and written communication skills with individuals from various cultures such as fellow workers, management, and customers;  (C) locate, read, and interpret documents such asservice and repair information, technical bulletins, specifications, schematics, and parts catalogs; and  (D) apply mathematical skills to the estimating process such as establishing charges and totals, profit margins, technician productivity, and shop efficiency.  (10) The student applies the technical knowledge and skills of estimating in simulated or actual work situations. The student is expected to:  (A) locate and record customer/vehicle owner information;  (B) locate and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant;  (C) identify and record vehicle options, including trim level, paint code, accessories, and modifications;  (D) identify the safety systems;  (E) apply appropriate estimating and parts terminology;  (F) determine and apply appropriate estimating sequence;  (G) utilize estimating guide procedure pages;  (H) estimate labor time for operations;  (I) select appropriate labor rates for each operation such as structural, non-structural, mechanical, and refinish;  (J) select and price replacement parts such as original equipment manufacturer (OEM), alternative/optional OEM, aftermarket, recycled/used, remanufactured, rebuilt, and reconditioned parts;  (K) determine labor time, prices, charges, allowances, or fees for non-included operations and miscellaneous items;  (L) determine additional material and charges such as environmental, administrative, shop, and disposal fees;  (M) determine refinishing material and charges;  (N) review computer-assisted and manually written estimates and verify that the information is correct;  (O) identify labor time and material charges for restoring corrosion protection; and  (P) determine the approximate vehicle retail value compared to the repair cost. | |