STRANDS AND STANDARDS
COLLISION REFINISHING & PAINTING

Learning that works for Utah
CTE®

Course Description

This course prepares individuals to safely prepare, mask, prime, seal, and paint vehicles and parts; use and maintain spray guns, booths, and equipment; address paint defects; mix, match, tint, and blend paint; store and dispose of hazardous materials; understand the corrosion protection process; and sand, buff, and detail a refinished vehicle. Work ethics and productivity are an integral part of the classroom and laboratory activities of this program.

Intended Grade Level	10-12
Units of Credit	0.5-1.0
Core Code	40.09.00.00.015
Concurrent Enrollment Core Code	40.09.00.13.015
Prerequisite	Basic Automotive Collision Repair
Skill Certification Test Number	N/A
Test Weight	N/A
License Area of Concentration	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Automotive Collision Repair
Endorsement 2	N/A
Endorsement 3	N/A

STRAND 1: SAFETY

Students will understand and demonstrate safety and environmental practices.

Standard 1

Successfully complete a safety program before entering a shop space.

Standard 2

Locate and understand basic and hazardous information from a Safety Data Sheet (SDS) for products used in the collision repair industry.

- Proper product labeling

Standard 3

Identify, select, inspect, and properly use appropriate personal protective equipment (PPE).

- Eye protection
- Hand protection
- Body protection
- Respiratory protection
- Hearing protection

Standard 4

Comply with OSHA regulations.

Standard 5

Locate Original Equipment Manufacturer (OEM) procedures to identify material and composition of the vehicle being repaired (mild steel, high strength steel, ultra-high strength steel, aluminum, etc.).

Standard 6

Differentiate and understand safety precautions between alternative fuel vehicles, supplemental restraint system (SRS) systems, advanced driver assistance systems (ADAS).

Performance Skills

- Pass a safety test with 100% accuracy.
- Locate, name, and demonstrate all safety equipment and procedures.
- Demonstrate correct use of PPE.
- Recognize and report potential safety hazards.
- Identify proper material labeling.
- Develop a logical repair plan and methods.
- Perform vehicle clean-up; complete quality control using a checklist on operations performed.
- Demonstrate safe pulling and clamping processes.

STRAND 2: AUTOMOTIVE FINISHES

Students will analyze different types of automotive finishes and their applications.

Standard 1

Identify and distinguish between the different types of automotive finishes.

- Primers
- Base coats (solvent/waterborne)
- Clear coats
- Tri-coats
- Vinyl wraps
- Oil-based
- Enamel
- Polyurethane
- Lacquer

Standard 2

Select the proper finish for repairs based on environmental conditions.

- Waterborne
- Solvent

Standard 3

Read and understand how to mix a product from the product data sheet (PDS).

- Expiration dates
- Mixing ratios
- Pot life

Standard 4

Locate vehicle Original Equipment Manufacturer (OEM) paint codes.

STRAND 3: SURFACE PREPARATION

Students will apply principles needed to prepare a surface for refinishing.

Standard 1

Select, and properly use PPE when preparing the surface of a vehicle for refinishing.

Standard 2

Properly clean the entire vehicle to remove contaminants.

Standard 3

Remove paint finish as needed.

- Surface prep for primer
- Surface prep for blend (solid/metallic/tri-coat)
- Chemical stripping

Standard 4

Mask/protect areas that will not be refinished

- Recess/back masking
- Foam door type/aperture
- Plastic
- Paper

Standard 5

Remove and install pinstripes, decals, and emblems.

Standard 6

Mix and apply paint based on manufacturer's specifications.

- Primer
- Undercoating
- Corrosion protection
- Chip coatings

Standard 7

Measure paint film thickness to determine surface prep method.

- OEM
- Max
- Wet

Performance Skills

- Successfully prepare a vehicle surface for refinishing.
- Successfully prevent overspray on a vehicle.
- Correctly mix and apply paint based on manufacturer's specifications.
- Design repair method based on collected paint film thickness data.
- Demonstrate proper use of PPE.

STRAND 4: SPRAY GUNS

Students will safely operate, clean, and maintain spray guns and related equipment.

Standard 1

Assess the function of a spray gun and its related components.

- Air hoses
- Regulators
- Air lines
- Air source
- Spray environment
- Fillers
- Air cap
- Fluid tip
- Fluid nozzle
- Needle
- Fluid passage

Standard 2

Differentiate spray gun setups for products being applied.

- Fluid needle
- Nozzle
- Cap

Standard 3

Determine proper spray patterns and corrections.

- Crescent
- Heavy to the top/bottom
- Heavy in the middle
- Heavy on the ends
- Elliptical

Standard 4

Demonstrate an understanding of the operation of pressure spray equipment.

- Siphon feed
- Gravity feed
- High Volume, Low Pressure (HVLP)
- Reduced Pressure (RP)
- Airbrush
- Touch-up

Performance Skills

- Inspect, clean, and determine condition of spray guns and related equipment.
- Select spray gun and setup for product being applied.
- Test and adjust spray gun using fluid, air and pattern control valves.
- Correctly operate pressure spray equipment.

STRAND 5: COLOR THEORY

Students will analyze and adjust colors to match a given vehicle.

Standard 1

Locate and use vehicle OEM paint codes for color mixing and matching purposes (color variants).

Standard 2

Explain the color wheel and color interactions.

- Movement across color wheel
- Hue
- Chroma
- Value
- Saturation

Standard 3

Assess perspective angles in their relation to color appearance.

- Flop 1
- Flop 2
- 45 degree

Standard 4

Interpret toner pictographs.

- Color hue direction
- Color flop
- Flop 1
- Flop 2
- Color
- Coarseness level

Standard 5

Create a sprayout card according to the relevant automotive finish.

- Letdown panel
- Color effect panel

Standard 6

Differentiate lighting conditions and the impact on color appearance.

- Ishihara test
- Light spectrum
- Color metamerism
- Reflection
- Refraction

Performance Skills

- Accurately mix and tint a given paint.
- Perform a quality sprayout card.
- Apply concepts of proper lighting.

STRAND 6: REFINISHING APPLICATION

Students will perform the procedures necessary in the application of a finish.

Standard 1

Select, and properly use PPE when applying refinishing materials to a vehicle surface.

Standard 2

Analyze corrosion protection and adhesion.

- OEM E-Coat
- Direct to Metal (DTM) Primer
- Seam Sealer
- Chip-Coating
- Undercoating
- Bed Lining
- Powder Coating
- Plastic adhesion promoter

Standard 3

Analyze and correct paint defects.

- Solvent popping
- Orange peel
- Dry spray
- Blistering
- Wrinkling
- Tiger/zebra striping
- Runs/sags
- Fish eye
- Lifting
- Clouding
- Overspray

Standard 4

Differentiate spray techniques and their appropriate applications.

- Gun arc
- Angle
- Distance
- Travel speed
- Spray pattern overlap
- Fan pattern size

Performance Skill

- Perform proper spray techniques.
- Apply concepts to correct defects.
- Demonstrate proper use of PPE.

STRAND 7: DETAILING & SERVICES

Students will perform detailing and related services of a vehicle.

Standard 1

Select, and properly use PPE when detailing and applying services to a vehicle.

Standard 2

Correct finishing defects (measure and record film thickness before and after buffing).

- Cut
- Buff
- Polish
- De-nib
- Claybar (overspray removal)

Standard 3

Perform interior detailing.

- Vacuum
- Glass care
- Upholstery care
- Stain & odor removal

Standard 4

Perform exterior detailing.

- Freshly refinished panel care.
- Exterior washing.
- Tire care
- Body openings/door jambs
- Decals and emblems

Standard 5

Perform paint defect correction.

- Airborne contaminants
- Die-back conditions
- Chalking/oxidation
- Swirl marks
- Wheel burns
- Acidic damage (bird droppings, tree sap)

Standard 6

Demonstrate use of customer care materials.

- Air fresheners
- Plastic steering wheel cover
- Paper floor mat
- Plastic seat cover

Standard 7

Discuss aftermarket detailing services.

- Window tinting
- Paint protection film (PPF).
- Hydro dipping
- Ceramic coating
- Vinyl wraps

Performance Skill

- Perform a total vehicle detailing service.

STRAND 8: CTSOs & WORKPLACE SKILLS

Students will be encouraged to participate in a relevant CTSO through the demonstration of automotive collision repair & refinishing workplace and career readiness skills. These standards will not appear on state skill certification exams, but should be taught throughout the duration of the course.

Standard 1

Students will display personal skills related to the essential values, personality traits, and personal characteristics for success in automotive collision repair & refinishing and life.

- **Integrity** - demonstrate honesty and personal responsibility for actions in repairing and maintaining automotive collision repair and refinishing.
- **Work ethic** - demonstrate tenacity, hard work, excellence, punctuality, meet deadlines; and be self-directed when completing tasks in the automotive collision repair and refinishing classroom or shop.
- **Professionalism -** demonstrate maturity, self-confidence; and a positive image when working with teammates or clients on automotive collision repair or refinishing jobs/projects.
- **Responsibility** - demonstrate dependability, consistency, and personal well-being when safely completing automotive collision repair or refinishing tasks.
- **Adaptability/Flexibility** - Foster creativity, new ideas, and resilience when working to solve problems in automotive collision and repair or refinishing tasks.
- **Self-motivated** - demonstrate a willingness to learn, independence, initiative, and a positive attitude when approaching new information

Standard 2

Students will display workplace skills related to the essential attitudes and abilities for success in the automotive collision repair and refinishing industry.

- **Communication** – Demonstrates skills in listening and speaking; communicates professionally with teammates, supervisors, and customers in relation to automotive collision repair and refinishing.
- **Decision making** – Analyzes key facts, data, and situations to employ reasoning skills for completing automotive collision repair and refinishing tasks.
- **Teamwork** – Builds trusting relationships, works cooperatively with others and utilizes individual strengths of team members when completing automotive collision repair and refinishing tasks.
- **Planning, organizing, and management** – Designs, prepares, and implements automotive collision repair and refinishing tasks within a desired timeframe; Sets priorities and responds to changing priorities.
- **Leadership** – Builds positive relationships and mitigates conflict.

Standard 3

Students will display technical skills that are grounded in automotive collision repair and refinishing that deliver essential knowledge and competencies for success in the industry.

- **Computer and technology literacy** – specific to the program area.
- **Job specific skills** – specific to the program area.
- **Safety and health** - specific to the program area.
- **Service orientation** – responds to internal and external customers; demonstrates focus and presence; attends to personal matters away from the classroom.
- **Professional development** – demonstrates openness to learn, grow, and change in the automotive collision repair and refinishing industry.

Skill Certification Test Points by Strand

Test Name	Test #	Number of Test Points by Strand										Total Points	Total Questions
		1	2	3	4	5	6	7	8	9	10		