

# Auto Body Painting & Refinishing

Course Number - 20116

## Rationale Statement:

There is a high demand for motivated and creative individuals in the auto-body industry. The desire for the students to receive industry based training at the basic level and step up to higher level of competency in this field is the ultimate goal of this course.

**Suggested grade level: 11-12**

## Topics covered:

- **Automotive technology safety practices**
- **HSE requirements**
- **Surface preparation**
- **Spray gun and related equipment operations**
- **Paint mixing, matching and applying**
- **Identifying paint defects**
- **Decals and finishing**
- **Career Exploration**

## Core Technical Standards & Examples

<b>Indicator #1: Automotive technology safety practices.</b>	
<b>Bloom's Taxonomy Level</b>	<b>Standard and Examples</b>
Apply	<b>ABP&amp;R 1.1 Demonstrate automotive technology safety practices.</b> Examples: <ul style="list-style-type: none"><li>• Use protective clothing and safety equipment.</li><li>• Summarize the proper use of MSDS (Material Safety Data Sheet)</li><li>• Examine basic shop safety using OSHA (Occupational Safety Health Administration) standards.</li><li>• Maintain a portfolio record of written safety examinations and equipment examinations for which the student has passed an operational checkout by the instructor.</li></ul>

**Indicator #2: Students will demonstrate the processes in keeping HSE requirements, while keeping in accordance with safety procedures.**

<b>Bloom's Taxonomy Level</b>	<b>Standard and Examples</b>
Apply	<p><b>ABP&amp;R 2.1 Inspect spray equipment to ensure compliance with applicable regulations and for safety and cleanliness hazards.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report on applicable regulations for compliance with safety and cleanliness hazards</li> <li>• Demonstrate proper inspection methods of spray equipment</li> </ul>
Apply	<p><b>ABP&amp;R 2.2 Choose and use the NIOSH approved personal sanding respirator and personal painting/refinishing respirator system.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Inspect condition and ensure fit and operation of respirator</li> <li>• Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation</li> <li>• Research and report on health hazards associated with improper use or failing respirator system</li> </ul>
Apply	<p><b>ABP&amp;R 2.3 Select and use the proper personal safety equipment for various shop operations</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research OSHA standards that apply to personal safety equipment</li> <li>• Develop a written safety policy for shop operations</li> <li>• Practice safety policy</li> </ul>

**Indicator #3: Students will demonstrate the process involved in surface preparation.**

<b>Bloom's Taxonomy Level</b>	<b>Standard and Examples</b>
Apply	<p><b>ABP&amp;R 3.1 Remove and replace exterior trim and components necessary for proper surface preparation.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify what tools are needed to remove trim</li> <li>• Demonstrate what is the best way to remove trim</li> <li>• Clean and reinstall trim</li> </ul>
Apply	<p><b>ABP&amp;R 3.2 Inspect and identify a substrate type of finish and surface condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report on what a substrate is, and what they are made of</li> <li>• Inspect finish of substrate and explain what condition it is in</li> </ul>

	<ul style="list-style-type: none"> <li>• Demonstrate how to use total product system</li> <li>• Develop and discuss a plan for refinishing using a total product system</li> </ul>
Apply	<p><b>ABP&amp;R 3.3 Prepare paint finish in accordance with manufacturer's recommendations.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Inspect paint finish</li> <li>• Demonstrate how to prep a vehicle or panel for refinishing</li> <li>• Explain what a correctly prepped panel should look like</li> </ul>
Apply	<p><b>ABP&amp;R 3.4 Apply suitable metal treatment or primer in accordance with total product systems.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Discuss which products are to be used when treating bare metal</li> <li>• Identify which primers are used in certain applications</li> <li>• Apply metal treatment or primer to meet application needs</li> </ul>
Apply	<p><b>ABP&amp;R 3.5 Mix primer, primer-surfacer or primer-sealer and apply onto surface of repaired area.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report difference between primers</li> <li>• Demonstrate how to correctly mix primers</li> <li>• Prepare repair area correctly before priming</li> <li>• Mask off area to be primed</li> <li>• Apply primer to repair area</li> </ul>
Apply	<p><b>ABP&amp;R 3.6 Apply two-component finishing filler to minor surface imperfections.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Explain minor surface imperfections</li> <li>• Identify when a minor surface imperfection is found</li> <li>• Demonstrate how this imperfection will be fixed</li> </ul>
Apply	<p><b>ABP&amp;R 3.7 Dry or wet sand area to which primer-surfacer has been applied.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify and demonstrate steps required to sand primer using wet sanding method</li> <li>• Identify and demonstrate steps required to sand primer using dry sanding method</li> <li>• Research, according to industry specifications, what grit sand paper to use for both wet and dry</li> </ul>
Apply	<p><b>ABP&amp;R 3.8 Dry sand area on which two-component finishing filler has been applied.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Learn steps in sanding two-component finishing filler</li> <li>• Identify what grit sand paper to use on filler</li> <li>• Demonstrate how to properly dry sand an area on which finishing filler has been applied</li> </ul>

Apply	<p><b>ABP&amp;R 3.9 Apply suitable sealer and/or stone chip resistant coating to the area being refinished when sealing of coating is needed or desirable.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Understand when to apply sealer</li> <li>• Demonstrate how to apply sealer</li> <li>• Apply chip guard to a repair area if needed</li> <li>• Discuss the difference in chip guards</li> </ul>
Apply	<p><b>ABP&amp;R 3.10 Restore corrosion-resistant coatings, caulking and seam sealers to repaired areas.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research procedures to apply corrosion-resistant coating</li> <li>• Research and report what corrosion-resistant coatings are</li> <li>• Research and report on different seam-sealers and caulking</li> <li>• Apply seam-sealers and caulking</li> </ul>
Apply	<p><b>ABP&amp;R 3.11 Prepare adjacent panels for blending.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Explain purpose of blending</li> <li>• Research procedures to prep a panel for blending</li> <li>• Demonstrate effective techniques to prep panels for blending</li> </ul>

**Indicator #4: Students will demonstrate the processes involved in spray gun and related equipment operations.**

<b>Bloom's Taxonomy Level</b>	<b>Standard and Examples</b>
Apply	<p><b>ABP&amp;R 4.1 Check and adjust spray gun operation for HVLP (high volume,) or LVLP (low volume, low pressure) guns.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify the parts of a spray gun and their functions</li> <li>• Research procedures for setting up a gun for spraying</li> <li>• Demonstrate how to use all of the functions on a gun to obtain a perfect spray pattern</li> </ul>
Apply	<p><b>ABP&amp;R 4.2 Set-up (fluid needle, nozzle, and cap) and adjust spray gun using fluid, air and pattern control valves.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify parts of spray gun</li> <li>• Demonstrate how to adjust spray gun for painting</li> <li>• Demonstrate the correct spray pattern using air, pattern and fluid control knobs</li> </ul>

**Indicator #5: Students will demonstrate the processes involved in paint mixing, matching and applying.**

<b>Bloom's Taxonomy Level</b>	<b>Standard and Examples</b>
Apply	<p><b>ABP&amp;R 5.1 Prepare paint according to manufacturer's procedures.</b> Examples:</p> <ul style="list-style-type: none"> <li>• Identify the correct steps in preparing paint according to manufacturer's procedures</li> <li>• Use manufacturer's mixing ratio to ensure proper paint color</li> <li>• Demonstrate how to: reduce, active/catalyze product, shake product and strain product to be sprayed</li> </ul>
Apply	<p><b>ABP&amp;R 5.2 Apply finish using appropriate spray techniques for the finish being applied.</b> Examples:</p> <ul style="list-style-type: none"> <li>• Identify when to use each spray technique</li> <li>• Learn each one of these techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap)</li> <li>• Demonstrate each of these techniques until they are completed to industry specification.</li> </ul>
Apply	<p><b>ABP&amp;R 5.3 Apply selected product on test panel and let-down panel in accordance with manufacturer's recommendations.</b> Examples:</p> <ul style="list-style-type: none"> <li>• Understand how a test panel and let down panel are used</li> <li>• Understand how different factors will change color</li> <li>• Demonstrate how to use a test panel or let down panel to achieve a good color match</li> <li>• Check for color match</li> </ul>
Apply	<p><b>ABP&amp;R 5.4 Apply single stage topcoat for refinishing.</b> Examples:</p> <ul style="list-style-type: none"> <li>• Demonstrate how to apply a single stage topcoat</li> <li>• Explain where and when single stage topcoats are used</li> </ul>
Apply	<p><b>ABP&amp;R 5.5 Apply basecoat/clear coat for overall refinishing.</b> Examples:</p> <ul style="list-style-type: none"> <li>• Demonstrate how to apply a basecoat/clear coat finish</li> <li>• Explain what the difference is between a basecoat/clear coat finish and a single stage finish</li> <li>• Explain the recommended time to use each type</li> </ul>
Apply	<p><b>ABP&amp;R 5.6 Denib and polish finishes where necessary.</b> Examples:</p> <ul style="list-style-type: none"> <li>• Identify the correct steps in the buffing process</li> <li>• Demonstrate proper techniques to denib a panel</li> <li>• Demonstrate proper techniques to buff and polish the denibed spots</li> </ul>

Apply	<p><b>ABP&amp;R 5.7 Refinish rigid, semi-rigid and flexible plastic parts.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify and explain the difference between rigid, semi-rigid and flexible</li> <li>• Demonstrate the correct process to refinishing these types of plastic</li> <li>• Identify and explain which parts need flex additive added to the refinished products</li> </ul>
Apply	<p><b>ABP&amp;R 5.8 Mix paint using a formula.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research how to pull up a formula</li> <li>• Demonstrate how to pull up a formula</li> <li>• Identify what quantity to mix and how to mix paint using a formula</li> <li>• Demonstrate how to mix paint using the paint mixing system scale and computer</li> </ul>
Apply	<p><b>ABP&amp;R 5.9 Identify poor hiding colors; determine necessary action.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report which colors have poor coverage</li> <li>• Identify which sealers are to be used under poor coverage colors</li> <li>• Demonstrate how this is done</li> </ul>
Understand	<p><b>ABP&amp;R 5.10 Verify alternative color formula to achieve a blendable match.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Understand what a color alternative deck is</li> <li>• Report on how to use a color alternative deck</li> <li>• Examine blendable match</li> </ul>

<b>Indicator #6: Students will demonstrate the processes involved in identifying paint defects.</b>	
<b>Bloom's Taxonomy Level</b>	<b>Standard and Examples</b>
Apply	<p><b>ABP&amp;R 6.1 Identify blistering (rising of the paint surface) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report what causes blistering</li> <li>• Research and report procedures to identify blistering</li> <li>• Demonstrate proper techniques to repair blistering</li> </ul>
Apply	<p><b>ABP&amp;R 6.2 Identify blushing (milky or hazy formation) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Learn to identify blushing,</li> <li>• Research and report what causes blushing</li> <li>• Demonstrate proper techniques to repair a blushing spot</li> </ul>

Apply	<p><b>ABP&amp;R 6.3 Identify a dry spray appearance in the paint surface and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify and explain what dry spray is</li> <li>• Research and report how dry spray happens</li> <li>• Demonstrate dry spray repair</li> </ul>
Apply	<p><b>ABP&amp;R 6.4 Identify the presence of fish-eyes (crater-like openings) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify fish-eyes</li> <li>• Research how fish eyes happen</li> <li>• Demonstrate steps to take to correct fish eyes</li> </ul>
Apply	<p><b>ABP&amp;R 6.5 Identify lifting and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify and explain lifting</li> <li>• Research and report what causes lifting</li> <li>• Correct lifting problems</li> </ul>
Apply	<p><b>ABP&amp;R 6.6 Identify clouding (mottling and streaking in metallic finishes) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report what streaking and mottling are in metallic paint</li> <li>• Determine the cause of clouding</li> <li>• Develop a plan to correct these problems</li> <li>• Demonstrate how to repair these problems</li> </ul>
Apply	<p><b>ABP&amp;R 6.7 Check for orange peel and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify and report what causes orange peel</li> <li>• Demonstrate proper techniques to correct these problems while spraying</li> <li>• Demonstrate proper techniques to correct these problems with buffing</li> </ul>
Apply	<p><b>ABP&amp;R 6.8 Check for overspray and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research how to look for overspray</li> <li>• Report on how overspray happens and what it can do</li> <li>• Demonstrate proper techniques to remove overspray</li> </ul>
Apply	<p><b>ABP&amp;R 6.9 Identify solvent popping in freshly painted surface and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Understand and report what solvent popping is</li> <li>• Recognize and report how solvent pop happens</li> <li>• Evaluate and correct these problems</li> </ul>

Apply	<p><b>ABP&amp;R 6.10 Visually identify sags and runs in paint surfaces and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Discuss the difference between a run and a sag</li> <li>• Identify and report what causes these problems</li> <li>• Demonstrate how to repair the run or sag</li> </ul>
Apply	<p><b>ABP&amp;R 6.11 Identify sanding marks (sand scratch swelling) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify causes for sanding marks and swelling</li> <li>• Demonstrate techniques to look for sanding marks and swelling</li> <li>• Demonstrate how to repair sanding marks and swelling</li> </ul>
Apply	<p><b>ABP&amp;R 6.12 Identify contour mapping (shrinking and splitting) while finish is drying and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Recognize what shrinking is</li> <li>• Define how shrinking happens</li> <li>• Demonstrate steps to help eliminate this problem</li> </ul>
Apply	<p><b>ABP&amp;R 6.13 Determine color difference (off-shade) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Demonstrate techniques to identify color mismatch</li> <li>• Identify the causes of color difference</li> <li>• Explain how to correct this problem</li> <li>• Demonstrate how to correct this problem</li> </ul>
Apply	<p><b>ABP&amp;R 6.14 Identify tape tracking, the cause(s) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Analyze and discuss what tape tracking is and why it happens</li> <li>• Identify what to do to avoid tape tracking on jobs</li> <li>• Repair tape tracking</li> </ul>
Apply	<p><b>ABP&amp;R 6.15 Identify low gloss condition and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report what causes low gloss</li> <li>• Explain how to repair low gloss situations</li> <li>• Demonstrate how to repair low gloss situations</li> </ul>
Apply	<p><b>ABP&amp;R 6.16 Test for poor adhesion and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Determine the cause of poor adhesion</li> <li>• Understand and report how to test for poor adhesion</li> <li>• Demonstrate how to test for poor adhesion</li> <li>• Develop a plan on how to avoid poor adhesion</li> </ul>

Apply	<p><b>ABP&amp;R 6.17 Identify paint cracking (crowsfeet or line-checking, micro-checking, etc.) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report what paint cracking is</li> <li>• Identify and list causes of paint cracking</li> <li>• Demonstrate how to repair paint cracking</li> </ul>
Apply	<p><b>ABP&amp;R 6.18 Spot corrosion and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research what spot corrosion is</li> <li>• Understand what causes spot corrosion</li> <li>• Repair affected area</li> </ul>
Apply	<p><b>ABP&amp;R 6.19 Identify dirt or dust in the paint surface and correct.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Determine the cause(s) for dirt or dust in the paint surface</li> <li>• Identify dirt or dust in the paint surface</li> <li>• Correct the condition that caused dirt or dust in the paint surface</li> </ul>
Apply	<p><b>ABP&amp;R 6.20 Look at water spotting and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Determine the causes of water spotting</li> <li>• Understand and report effects of acid rain, and hard water spotting</li> <li>• Correct these problems</li> </ul>
Apply	<p><b>ABP&amp;R 6.21 Physically identify finish damage caused by bird droppings, tree sap, and other natural causes and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify finish damage caused by natural causes</li> <li>• Explain how this affects the refinish of a vehicle</li> <li>• Explain and demonstrate how to repair</li> </ul>
Apply	<p><b>ABP&amp;R 6.22 Identify finish damage caused by airborne contaminants (acids, soot, and other industrial-related causes) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify finish damage caused by airborne contaminants</li> <li>• Research and do an oral presentation on what causes these thing</li> <li>• Demonstrate how to repair this condition</li> </ul>
Apply	<p><b>ABP&amp;R 6.23 Identify die-back conditions (dulling of the paint film showing haziness) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report what causes die-back</li> <li>• Identify die-back</li> <li>• Demonstrate how to repair die-back</li> </ul>
Apply	<p><b>ABP&amp;R 6.24 Check for chalking (oxidation) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Discuss what chalking is</li> <li>• Identify what causes chalking</li> <li>• Repair chalking</li> </ul>

Apply	<p><b>ABP&amp;R 6.25 Identify bleed-through (staining) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Research and report what bleed through is</li> <li>• Explain what causes it and develop a plan to prevent it</li> <li>• Demonstrate or explain how to repair and prevent bleed through</li> </ul>
Apply	<p><b>ABP&amp;R 6.26 Identify pin holing and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify pinholes</li> <li>• Identify causes of pinholes</li> <li>• Demonstrate how to correct pin holing</li> </ul>
Apply	<p><b>ABP&amp;R 6.27 Visually identify buffing-related imperfections and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify buffing imperfections (swirl marks, wheel burns)</li> <li>• Research how to repair these imperfections</li> <li>• Demonstrate how to repair these imperfections</li> </ul>
Apply	<p><b>ABP&amp;R 6.28 Identify pigment flotation (color change through film build) and correct the condition.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Identify pigment flotation</li> <li>• Determine the cause(s) of pigment flotation</li> <li>• Correct the condition</li> </ul>

**Indicator #7: Students will demonstrate an understanding of the processes involved in completing the final details.**

Bloom's Taxonomy Level	Standard and Examples
Apply	<p><b>ABP&amp;R 7.1 Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Understand how to remove old decals, stripe, etc.</li> <li>• Demonstrate how to remove decals</li> <li>• Prep the decal surface for installation</li> <li>• Understand how to apply decal, stripe, etc.</li> <li>• Apply decal etc.</li> </ul>

**Indicator #8: Students explore career opportunities in the Transportation, Distribution and Logistics career cluster.**

<b>Bloom's Taxonomy Level</b>	<b>Standard and Examples</b>
Understand	<p><b>ABP&amp;R8.1 Research career opportunities in the Transportation, Distribution and Logistics field.</b></p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Utilizing the career exploration software, research and write a report on career opportunities in TD&amp;L field</li> <li>• Utilize the career exploration software to research educational requirements for a chosen career path</li> <li>• Utilizing career exploration software, update the student's portfolio</li> </ul>