

Auto Body Non-structural Analysis

Course Number - 20125

Rationale Statement:

There is a high demand for motivated and creative individuals in the automotive repair 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**
- **Nonstructural inspection and repair**
- **Body panel repair**
- **Metal finishing and body filling**
- **Repairing and replacing movable glass**
- **Metal welding and cutting**
- **Plastic repairs and adhesives**

Indicator #1: Automotive technology safety practices.	
Bloom's Taxonomy Level	Standard and Examples
Apply	NA 1.1 Demonstrate automotive technology safety practices. Examples: <ul style="list-style-type: none">• Use protective clothing and safety equipment• Maintain a portfolio record of written safety examinations and equipment examinations for which the student has passed an operational checkout by the instructor.• Develop an understanding and application of MSDS (Material Safety Data Sheets) and OSHA regulations

Indicator #2: Students will demonstrate the processes involved in preparation of nonstructural inspection and repair.

Bloom's Taxonomy Level	Standard and Examples
Apply	<p>NA 2.1 Remove and replace exterior/interior trim and moldings and components. Examples:</p> <ul style="list-style-type: none"> • Understand and demonstrate the different attachment methods • Understand the difference of molding materials • Understand with difference of materials comes different storage procedures • Remove and replace trim and molding using proper tools
Apply	<p>NA 2.2 Remove and replace nonstructural body panels and components that may interfere with or be damaged during repair. Examples:</p> <ul style="list-style-type: none"> • Understand and demonstrate attachment methods • Understand what parts will need to be removed before repairs are started • Know how to store reusable parts and the hardware that attaches the part • Understand the importance of proper hardware storage • Demonstrate removal and replacement of nonstructural body panels and components
Apply	<p>NA 2.3 Remove and replace all vehicle mechanical and electrical components that may interfere with or be damaged during repair. Examples:</p> <ul style="list-style-type: none"> • Identify electrical components that need to be disconnected before specific repair operations are started • Demonstrate how to disconnect wiring connections • Identify mechanical components • Demonstrate how to remove and replace mechanical components
Apply	<p>NA 2.4 Remove corrosion protection, undercoatings, sealers and other protective coatings necessary to perform repairs. Examples:</p> <ul style="list-style-type: none"> • Research and report what corrosion protection is • Demonstrate the different techniques used for corrosion protection removal • Remove protective coatings necessary to perform repairs
Apply	<p>NA 2.5 Remove and replace repairable plastics and other components that are recommended for off-vehicle repair. Examples:</p> <ul style="list-style-type: none"> • Understand the type of retainers used to attach plastic parts to the vehicle

	<ul style="list-style-type: none"> • Understand why repairable plastics need to be off the vehicle for repair • Understand the importance of proper hardware storage • Remove and replace repairable plastics and other components
Apply	<p>NA 2.6 Apply environmental practices associated with vehicle components and systems such as substrates, fluids, refrigerants and batteries, etc.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify hazardous materials used in the vehicle • Understand methods to properly dispose of hazardous materials used in the vehicle • Dispose of hazardous materials properly

Indicator #3: Students will demonstrate the processes involved in outer body panel repairs, replacements and adjustments.

Bloom's Taxonomy Level	Standard and Examples
Apply	<p>NA 3.1 Remove and replace bolted, bonded or welded steel panel or panel assemblies.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Exhibit knowledge in the way a part is attached • Demonstrate the procedures needed to replace a part • Remove and replace panel/panel assemblies
Apply	<p>NA 3.2 Replace and align deck lid, lid hinges and lid latch.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Demonstrate the adjustment of deck lid hinges and there torsion rods • Identify and explain the difference between manual and electric latches • Understand the importance of proper hardware storage • Replace and align deck lid, lid hinges and lid latch
Apply	<p>NA 3.3 Replace, and align doors, tailgates, hatches, lift gates, latches, hinges and related hardware.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Understand the difference in alignment when doors have welded on hinges verses bolt on hinges • Understand why lift gates are so difficult to align • Explain the different attachment methods used between doors, tailgates and hatches • Demonstrate how to adjust strikers to get proper fit • Understand the importance of proper hardware storage • Demonstrate how to replace and align doors, tailgates and hatches

Apply	<p>NA 3.4 Replace, and align bumper bars, covers, reinforcement guards, isolators and mounting hardware.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify and report why bumper reinforcement requires replacement • Show and explain what part of a bumper is adjustable • Replace and align
Apply	<p>NA 3.5 Replace and align front fenders, headers and other panels.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Demonstrate the proper procedure to align a fender • Understand the importance of proper hardware storage • Properly replace front fenders, headers and other panels
Apply	<p>NA 3.6 Repair damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools and weld-on pull attachments.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Demonstrate different techniques used for dent removal • Use proper steps required before body filling stage • Repair panels to suitable conditions for body fillings or metal work
Apply	<p>NA 3.7 Diagnose and repair water leaks, dust leaks and wind noise.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Demonstrate ability to locate leaks using a number of techniques • Demonstrate the use of proper alignment technique and/or material to repair leak • Test for water and dust leaks and wind noise

Indicator #4: Students will demonstrate the processes involved in metal finishing and body filling.

Bloom's Taxonomy Level	Standard and Examples
Apply	<p>NA 4.1 Locate and reduce surface irregularities on a damaged body panel.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Locate damage and know proper removal methods • Demonstrate hammer and dolly techniques for shrinking metal • Demonstrate hammer and dolly techniques for stretching metal
Apply	<p>NA 4.2 Demonstrate application of body filler, rough sanding and finish sanding.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Demonstrate knowledge in the mixing of body filler • Demonstrate proper technique used in shaping body filler before full cure time has been meet • Demonstrate technique of rough sanding body filler after the shaping

	<p>process</p> <ul style="list-style-type: none"> • Demonstrate technique in the stepping down of sanding grits to a finer grit as required
Apply	<p>NA 4.3 Cold shrink stretched panel areas to proper contour.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Define cold shrink • Demonstrate knowledge in the use of a shrinking hammer or a shrinking dolly • Apply cold shrink and attain proper contour

Indicator #5: Students will demonstrate proper procedures for moveable glass and hardware.

Bloom's Taxonomy Level	Standard and Examples
Apply	<p>NA 5.1 Repair or replace window regulators and accessories.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Diagnose window problems and adjust if necessary • Research and report window parts and removal methods • Repair/replace window regulators, run channels, glass, power mechanisms and related controls
Apply	<p>NA 5.2 Diagnose and repair water leaks, dust leaks and wind noises.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Locate leaks using a number of techniques • Use the proper alignment technique or use the proper materials for repair of leak • Demonstrate removal and replacing of weather-stripping using proper techniques

Indicator #6: Students will demonstrate the processes involved in metal welding and cutting.

Bloom's Taxonomy Level	Standard and Examples
Apply	<p>NA 6.1 Determine the correct welder type to be used in a specific welding situation.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify weldable and non-weldable materials used in collision repair • Demonstrate proper welder set-up for specific applications • Be able to identify the correct welder type for a specific welding situation (electrode, wire type, diameter and gas to be used)

Apply	<p>NA 6.2 Demonstrate the proper angle of the gun to the joint and direction of gun travel for the type of weld being made.</p> <p>Example:</p> <ul style="list-style-type: none"> • Develop an understanding of different angles for the different positions of welding • Identify when to use each position • Demonstrate weld in the flat, horizontal, vertical and overhead positions
Apply	<p>NA 6.3 Clean and prepare the metal to be welded.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Be able to prepare metal to be welded • Explain the importance of good metal fit-up • Apply weld through primer if necessary and clamp as required
Analyze	<p>NA 6.4 Determine the type of weld for each specific welding operation according to manufacturer's/industry specifications.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Differentiate between the various types of welds needed for the repair (continuous, butt weld with backing, plug, etc) • Demonstrate the different types of welds used in the collision repair field • Analyze which weld is needed in various situations
Apply	<p>NA 6.5 Perform the following welds: continuous, stitch, tack, plug, butt weld, with and without backing, and lap joints.</p> <p>Example:</p> <ul style="list-style-type: none"> • Research and report on each weld • Identify and explain which type of weld will be best for the repair and safe operation of vehicle • Demonstrate each weld
Apply	<p>NA 6.6 Perform visual and destructive tests on each weld type and make necessary adjustments for defects.</p> <p>Example:</p> <ul style="list-style-type: none"> • Understand the use of visual test for the safety of the repair • Explain the destructive test on each weld type • Demonstrate visual and destructive tests on each weld type • Understand welding defects and their causes by analyzing the weld • Develop a plan for necessary adjustments to the welding process when defects are present
Apply	<p>NA 6.7 Identify cutting process for different materials and locations in accordance with manufacturer's procedures.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Understand the safety procedures associated with any type of cutting operations • Identify what parts of the vehicle can be cut with various cutting methods • Demonstrate cutting operation

Indicator #7: Students will demonstrate the processes involved in plastic repair and adhesives.

Bloom's Taxonomy Level	Standard and Examples
Apply	<p>NA 7.1 Identify the types of plastic repair procedures. Examples:</p> <ul style="list-style-type: none"> • Identify types of plastic parts needing repairs • Identify the procedures to clean and prepare the surface of plastic parts • Prepare and clean surfaces
Apply	<p>NA 7.2 Repair rigid, semi-rigid, and flexible plastic panels according to manufacturer's/industry specifications. Examples:</p> <ul style="list-style-type: none"> • Identify semi-rigid, flexible and rigid plastic panels • Research and understand manufacturer's/industry specifications • Make needed repairs according to these specifications

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

Bloom's Taxonomy Level	Standard and Examples
Understand	<p>NA 8.1 Demonstrate independent and teamwork skills and explore career opportunities within the industry. Examples:</p> <ul style="list-style-type: none"> • Participate in Skills USA • Understand the importance of teamwork • Understanding how many different career opportunities are available through this program • Update student portfolios and personal learning plans