Course Description

This course prepares individuals to perform structural repairs on automobile uni-bodies, fixed glass, and frames. This course is based on the Automotive Service Excellence (ASE) automotive collision task list and the I-CAR training program. Work ethics and productivity are an integral part of the classroom and laboratory activities of this program. (asestudentcertification.com), (http://pdmdev.i-car.com/pdf/education.Foundation/natef_crosswalk_2006.pdf)

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<td>Core Code</td>
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<td>Skill Certification Test Number</td>
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STRAND 1

Students will be able to understand and demonstrate safety and environmental practices.

Standard 1
Explain the need for regulations and safety devices such as Environment Protection, state and local environmental laws, and regulations involved with the refinishing department. (4A1)

Standard 2
Locate hazardous warning information for products used in refinishing. Be able to locate basic information from a Material Safety Data Sheet (MSDS). (4A2)

Standard 3
Identify and select the proper personal protection equipment, inspect it, and demonstrate its proper use. (4A3)

Standard 4
Identify the Volatile Organic Compound (VOC) content of paint products and explain the environmental concerns. (4A4)

Standard 5
Understand safety practices related to general shop, personal protection, vehicle lifts, and hand and power equipment. (1A1)

Standard 6
Understand and identify different fasteners and their applications and repair procedures. (1B2)

Standard 7
Understand how to select and properly use hand and select power tools. (1B7)

Performance Skill
Understand and demonstrate safety and environmental practices.

- Explain the need for regulations and safety devices such as Environment Protection, state and local environmental laws, and regulations involved with the refinishing department. (4A1)
- Locate hazardous warning information for products used in refinishing. Be able to locate basic information from a Material Safety Data Sheet (MSDS). (4A2)
- Identify and select the proper personal protection equipment, inspect it, and demonstrate its proper use. (4A3)
- Identify the Volatile Organic Compound (VOC) content of paint products and explain the environmental concerns. (4A4)
- Understand safety practices related to general shop, personal protection, vehicle lifts, and hand and power equipment. (1A1)
- Understand and identify different fasteners and their applications and repair procedures. (1B2)
- Understand how to select and properly use hand and select power tools. (1B7)
STRAND 2

Students will be able to understand and demonstrate frame inspection and repair.

Standard 1
Diagnose and measure structural damage using tram and self-centering gauges.

Standard 2
Attach vehicle to anchoring devices.

Standard 3
Analyze, straighten and align mash (collapse) damage.

Standard 4
Analyze, straighten and align sag damage.

Standard 5
Analyze, straighten and align sidesway damage.

Standard 6
Analyze, straighten and align twist damage.

Standard 7
Analyze, straighten and align diamond frame damage.

Standard 8
Remove and replace damaged structural components.

Standard 9
Restore corrosion protection to repaired or replaced frame areas.

Standard 10
Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.

Standard 11
Align or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.

Standard 12
Identify heart limitations in structural components.

Standard 13
Restore structural foam.

Standard 14
Diagnose and measure structural damage using a universal measuring system (mechanical, electrical, laser).
Standard 15
Diagnose and measure structural damage to vehicles using a dedicated (fixture) measuring system.

Standard 16
Determine the extent of the direct and indirect damage and the direction of impact; document the methods and sequence of repair.

Standard 17
Analyze and identify crush/collapse zones.

Performance Skill
Understand and demonstrate frame inspection and repair.
- Diagnose and measure structural damage using tram and self-centering gauges.
- Attach vehicle to anchoring devices.
- Analyze, straighten and align mash (collapse) damage.
- Analyze, straighten and align sag damage.
- Analyze, straighten and align sidesway damage.
- Analyze, straighten and align twist damage.
- Analyze, straighten and align diamond frame damage.
- Remove and replace damaged structural components.
- Restore corrosion protection to repaired or replaced frame areas.
- Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.
- Align or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.
- Identify heart limitations in structural components.
- Restore structural foam.
- Diagnose and measure structural damage using a universal measuring system (mechanical, electrical, laser).
- Diagnose and measure structural damage to vehicles using a dedicated (fixture) measuring system.
- Determine the extent of the direct and indirect damage and the direction of impact; document the methods and sequence of repair.
- Analyze and identify crush/collapse zones.

STRAND 3
Students will be able to understand and demonstrate unibody inspection, measurement, and repair.

Standard 1
Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and chassis alignment problems.
Standard 2
Realign or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering and chassis alignment problems.

Standard 3
Diagnose and measure unibody damage using tram and self-centering gauges.

Standard 4
Determine and inspect the locations of all suspension, steering, and powertrain component attaching points on the vehicle.

Standard 5
Diagnose and measure unibody vehicles using a dedicated (fixture) measuring system.

Standard 6
Diagnose and measure unibody vehicles using a universal measuring system (mechanical, electronic, and laser).

Standard 7
Determine the extent of the direct and indirect damage and the direction of impact; plan and document the methods and sequence of repair.

Standard 8
Attach anchoring devices to vehicle; remove or reposition components as necessary.

Standard 9
Straighten and align cowl assembly.

Standard 10
Straighten and align roof rails/headers and roof panels.

Standard 11
Straighten and align hinge and lock pillars.

Standard 12
Straighten and align vehicle openings, floor pans, and rocker panels.

Standard 13
Straighten and align quarter panels, wheelhouse assemblies, and rear body sections (including rails and suspension/powertrain mounting points).

Standard 14
Straighten and align front-end sections (aprons, strut towers, upper and lower rails, steering, and suspension/power train mounting points, etc.).

Standard 15
Identify heat limitations in unibody vehicles.
Standard 16
Identify proper cold stress relief methods.

Standard 17
Repair damage using power tools and hand tools to restore proper contours and dimensions.

Standard 18
Remove and replace damaged sections of structural steel body panels.

Standard 19
Restore corrosion protection to repaired or replaced unibody structural areas.

Standard 20
Determine the extent of damage to aluminum structural components; repair, weld, or replace.

Standard 21
Analyze and identify crush/collapse zones.

Performance Skill
Understand and demonstrate unibody inspection, measurement, and repair.
- Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and chassis alignment problems.
- Realign or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering and chassis alignment problems.
- Diagnose and measure unibody damage using tram and self-centering gauges.
- Determine and inspect the locations of all suspension, steering, and powertrain component attaching points on the vehicle.
- Diagnose and measure unibody vehicles using a dedicated (fixture) measuring system.
- Diagnose and measure unibody vehicles using a universal measuring system (mechanical, electronic, and laser).
- Determine the extent of the direct and indirect damage and the direction of impact; plan and document the methods and sequence of repair.
- Attach anchoring devices to vehicle; remove or reposition components as necessary.
- Straighten and align cowl assembly.
- Straighten and align roof rails/headers and roof panels.
- Straighten and align hinge and lock pillars.
- Straighten and align vehicle openings, floor pans, and rocker panels.
- Straighten and align quarter panels, wheelhouse assemblies, and rear body sections (including rails and suspension/powertrain mounting points).
- Straighten and align front-end sections (aprons, strut towers, upper and lower rails, steering, and suspension/power train mounting points, etc.).
- Identify heat limitations in unibody vehicles.
- Identify proper cold stress relief methods.
• Repair damage using power tools and hand tools to restore proper contours and dimensions.
• Remove and replace damaged sections of structural steel body panels.
• Restore corrosion protection to repaired or replaced unibody structural areas.
• Determine the extent of damage to aluminum structural components; repair, weld, or replace.
• Analyze and identify crush/collapse zones.

**STRAND 4**
Students will be able to understand and demonstrate fixed glass removal, reinstallation, or replacement.

**Standard 1**
Remove and reinstall or replace fixed glass (heated and non-heated) using recommended materials.

**Standard 2**
Remove and reinstall or replace modular glass using recommended materials.

**Performance Skill**
Understand and demonstrate fixed glass removal, reinstallation, or replacement.
- Remove and reinstall or replace fixed glass (heated and non-heated) using recommended materials.
- Remove and reinstall or replace modular glass using recommended materials.

**STRAND 5**
Students will be able to understand and demonstrate metal welding and cutting.

**Standard 1**
Identify weldable and non-weldable materials used in collision repair.

**Standard 2**
Weld and cut high-strength steel and other steels.

**Standard 3**
Weld and cut aluminum.

**Standard 4**
Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation.

**Standard 5**
Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the material being welded.
Standard 6
Store, handle, and install high-pressure gas cylinders.

Standard 7
Determine work clamp (ground) location and attach.

Standard 8
Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.

Standard 9
Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.

Standard 10
Protect computers and other electronic control modules during welding procedures.

Standard 11
Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required.

Standard 12
Determine the joint type (butt weld with backing, lap, etc.) for weld being made.

Standard 13
Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation.

Standard 14
Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and fillet.

Standard 15
Perform visual and destructive tests on each weld type.

Standard 16
Identify the causes of various welding defects; make necessary adjustments.

Standard 17
Identify the cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.

Standard 18
Identify the cutting process for different materials and locations; perform cutting operation.

Standard 19
Identify different methods of attaching non-structural components (squeeze type resistant spot welds (STRSW), riveting, non-structural adhesive, silicon bronze, etc.).
Performance Skill
Understand and demonstrate metal welding and cutting.

- Identify weldable and non-weldable materials used in collision repair.
- Weld and cut high-strength steel and other steels.
- Weld and cut aluminum.
- Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation.
- Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the material being welded.
- Store, handle, and install high-pressure gas cylinders.
- Determine work clamp (ground) location and attach.
- Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.
- Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.
- Protect computers and other electronic control modules during welding procedures.
- Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required.
- Determine the joint type (butt weld with backing, lap, etc.) for weld being made.
- Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation.
- Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and fillet.
- Perform visual and destructive tests on each weld type.
- Identify the causes of various welding defects; make necessary adjustments.
- Identify the cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.
- Identify the cutting process for different materials and locations; perform cutting operation.
- Identify different methods of attaching non-structural components (squeeze type resistant spot welds (STRSW), riveting, non-structural adhesive, silicon bronze, etc.).

STRAND 6
Students will be able to understand and perform damage analysis.

Standard 1
Position the vehicle for inspection.

Standard 2
Prepare vehicle for inspection by providing access to damaged areas.
Standard 3
Analyze damage to determine appropriate methods for overall repairs.

Standard 4
Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage.

Standard 5
Gather details of the incident/accident necessary to determine the full extent of vehicle damage.

Standard 6
Identify and record pre-existing damage.

Standard 7
Identify and record prior repairs.

Standard 8
Perform visual inspection of structural components and members.

Standard 9
Identify structural damage using measuring tools and equipment.

Standard 10
Perform visual inspection of non-structural components and members.

Standard 11
Determine parts, components, material type(s) and procedures necessary for a proper repair.

Standard 12
Identify type and condition of finish; determine if refinishing is required.

Standard 13
Identify suspension, electrical, and mechanical component physical damage.

Standard 14
Identify safety systems physical damage.

Standard 15
Identify interior component damage.

Standard 16
Identify damage to add-on accessories and modifications.

Standard 17
Identify single (one time) use components.

Performance Skill
Understand and perform damage analysis.
• Position the vehicle for inspection.
• Prepare vehicle for inspection by providing access to damaged areas.
• Analyze damage to determine appropriate methods for overall repairs.
• Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage.
• Gather details of the incident/accident necessary to determine the full extent of vehicle damage.
• Identify and record pre-existing damage.
• Identify and record prior repairs.
• Perform visual inspection of structural components and members.
• Identify structural damage using measuring tools and equipment.
• Perform visual inspection of non-structural components and members.
• Determine parts, components, material type(s) and procedures necessary for a proper repair.
• Identify type and condition of finish; determine if refinishing is required.
• Identify suspension, electrical, and mechanical component physical damage.
• Identify safety systems physical damage.
• Identify interior component damage.
• Identify damage to add-on accessories and modifications.
• Identify single (one time) use components.

**STRAND 7**

**Students will understand and perform estimating.**

**Standard 1**
Determine and record customer/vehicle owner information.

**Standard 2**
Identify and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant.

**Standard 3**
Identify and record vehicle options, including trim level, paint code, transmission, accessories, and modifications.

**Standard 4**
Identify safety systems; determine replacement items.

**Standard 5**
Apply appropriate estimating and parts nomenclature (terminology).

**Standard 6**
Determine and apply appropriate estimating sequence.
Standard 7
Utilize estimating guide procedure pages.

Standard 8
Apply estimating guide footnotes and headnotes as needed.

Standard 9
Estimate labor value for operations requiring judgement.

Standard 10
Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish).

Standard 11
Select and price OEM parts; verify availability, compatibility, and condition.

Standard 12
Select and price alternative/optional OEM parts; verify availability, compatibility and condition.

Standard 13
Select and price aftermarket parts; verify availability, compatibility, and condition.

Standard 14
Select and price recyclable/used parts; verify availability, compatibility and condition.

Standard 15
Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition.

Standard 16
Determine price and source of necessary sublet operations.

Standard 17
Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items.

Standard 18
Recognize and apply overlay deductions, included operations, and additions.

Standard 19
Determine additional material and charges.

Standard 20
Determine refinishing material and charges.

Standard 21
Apply math skills to establish charges and totals.
Standard 22
Interpret computer-assisted and manually written estimates; verify the information is current.

Standard 23
Identify procedural differences between computer-assisted systems and manually written estimates.

Standard 24
Identify procedures to restore corrosion protection; establish labor values, and material charges.

Standard 25
Determine the cost effectiveness of the repair and determine the approximate vehicle retail, and repair value.

Standard 26
Recognize the differences in estimation procedures when using different information provider systems.

Standard 27
Verify accuracy of estimate compared to the actual repair and replacement operations.

Performance Skill
Understand and perform estimating.

- Determine and record customer/vehicle owner information.
- Identify and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant.
- Identify and record vehicle options, including trim level, paint code, transmission, accessories, and modifications.
- Identify safety systems; determine replacement items.
- Apply appropriate estimating and parts nomenclature (terminology).
- Determine and apply appropriate estimating sequence.
- Utilize estimating guide procedure pages.
- Apply estimating guide footnotes and headnotes as needed.
- Estimate labor value for operations requiring judgement.
- Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish).
- Select and price OEM parts; verify availability, compatibility, and condition.
- Select and price alternative/optional OEM parts; verify availability, compatibility and condition.
- Select and price aftermarket parts; verify availability, compatibility, and condition.
- Select and price recyclable/used parts; verify availability, compatibility and condition.
COLLISION STRUCTURAL REPAIR

- Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition.
- Determine price and source of necessary sublet operations.
- Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items.
- Recognize and apply overlay deductions, included operations, and additions.
- Determine additional material and charges.
- Determine refinishing material and charges.
- Apply math skills to establish charges and totals.
- Interpret computer-assisted and manually written estimates; verify the information is current.
- Identify procedural differences between computer-assisted systems and manually written estimates.
- Identify procedures to restore corrosion protection; establish labor values, and material charges.
- Determine the cost effectiveness of the repair and determine the approximate vehicle retail, and repair value.
- Recognize the differences in estimation procedures when using different information provider systems.
- Verify accuracy of estimate compared to the actual repair and replacement operations.

STRAND 8
Students will be able to understand and perform customer relations and sales skills.

Standard 1
Acknowledge and/or greet customer/client.

Standard 2
Listen to customer/client; collect information and identify customers/client's concerns, needs and expectations.

Standard 3
Establish cooperative attitude with customer/client.

Standard 4
Identify yourself to customer/client; offer assistance.

Standard 5
Deal with angry customer/client.

Standard 6
Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process.
Standard 7
Recognize basic claims handling procedures; explain to customer/client.

Standard 8
Project positive attitude and professional appearance.

Standard 9
Provide and review warranty information.

Standard 10
Provide and review technical and consumer protection information.

Standard 11
Estimate and explain duration of out-of-service time.

Standard 12
Apply negotiation skills to obtain a mutual agreement.

Standard 13
Interpret and explain manual or computer-assisted estimate to customer/client.

Performance Skill
Understand and perform customer relations and sales skills.
- Acknowledge and/or greet customer/client.
- Listen to customer/client; collect information and identify customers/client's concerns, needs and expectations.
- Establish cooperative attitude with customer/client.
- Identify yourself to customer/client; offer assistance.
- Deal with angry customer/client.
- Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process.
- Recognize basic claims handling procedures; explain to customer/client.
- Project positive attitude and professional appearance.
- Provide and review warranty information.
- Provide and review technical and consumer protection information.
- Estimate and explain duration of out-of-service time.
- Apply negotiation skills to obtain a mutual agreement.
- Interpret and explain manual or computer-assisted estimate to customer/client.

STRAND 9
Students will understand the importance of career readiness skills as it relates to the workplace and outlined in the SkillsUSA Framework – Level 2.

Standard 1
Understand and demonstrate reliability.
• Determine individual time management skills.
• Explore what’s ethical in the workplace or school.
• Demonstrate awareness of government.
• Demonstrate awareness of professional organizations and trade unions.

Standard 2
Understand and demonstrate responsiveness.
• Define the customer.
• Recognize benefits of doing a community service project.
• Demonstrate social etiquette.
• Identify customer expectations.

Standard 3
Understand resiliency.
• Discover self-motivation techniques and establish short-term goals.
• Select characters of a positive image.
• Identify a mentor.

Standard 4
Understand and demonstrate workplace habits.
• Participate in a shadowing activity.
• Explore workplace ethics: codes of conduct.
• Recognize safety issues.
• Perform a skill demonstration.
• Exercise your right to know.

Standard 5
Understand and develop initiative.
• Develop personal financial skills.
• Develop a business plan.
• Investigate entrepreneurship opportunities.

Standard 6
Understand and demonstrate continuous improvement.
• Conduct a worker interview.
• Demonstrate evaluation skills.
• Examine ethics and values in the workplace.
• Develop a working relationship with a mentor.
• Construct a job search network.