



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	ACRP
Course Number:	1B
Descriptive Title:	Non-Structural Collision Repair and Welding
Division:	Industry and Technology
Department:	Automotive Collision Repair/Painting
Course Disciplines:	Automotive Collision Repair/Painting
Catalog Description:	This course parallels the Automotive Service Excellence (ASE) B3 certification topics of non-structural damage analysis and repair such as: vehicle construction, vehicle disassembly procedures, large dent repair, bolt-on panel replacement and alignment, non-structural steel Metal Inert Gas (MIG) welding, squeeze-type resistance spot welding (STRSW), glass replacement and plastic parts repair. The topics of replacing door skins, panel bonding, steel patch panel fabrication, weld-in panel replacement and basic aluminum panel repair are also covered. This course contains Inter-Industry Conference on Auto Collision Repair (I-CAR) curriculum for Non-Structural certification credit and promotes I-CAR steel welding certification standards.
Prerequisite:	Automotive Collision Repair/Painting 1A or Automotive Collision Repair/Painting 4A with a minimum grade of C in prerequisite or equivalent
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	3
Hours Laboratory (per week):	15
Outside Study Hours:	6
Total Course Hours:	324
Course Units:	8
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	
Transfer UC:	No
Effective Date:	

General Education: ECC	
Term:	
Other:	
CSU GE:	
Term:	
Other:	
IGETC:	
Term:	
Other:	
CalGETC:	
Term:	
Other:	
Student Learning Outcomes:	SLO #1 I-CAR MIG Welds Students will be able to set up and use a MIG welder properly and safely to perform three welds (lap, plug, reinforced butt) on automotive gauge steel according to I-CAR standards. SLO #2 Panel Misalignment Students will be able to identify panel misalignment due to improper installation, prior damage, and/or improper repair and choose the proper repair steps to correct the misalignment. SLO #3 Large Dent Removal Students will be able to use dent removal equipment such as the Maxi welder or stud welder to remove a large dent from an automotive panel with no rear access.
Course Objectives:	1. Complete a comprehensive Automotive Collision Repair/Painting safety test with 100% accuracy. 2. Identify mild steel, High Strength Steel (HSS) and aluminum components and perform the matching repair operations. 3. Remove, install and align door glass, bolt-on panels, door skins and plastic bumper covers. 4. Repair large dents using hydraulic and/or weld-on tools. 5. Measure, fit up and prepare a new non-structural panel for MIG, STRSW or panel bonding attachment. 6. Perform butt, lap and plug MIG welds on steel according to I-CAR certification specs. 7. Perform OBDII pre- and post-scans, as well as a post-repair final vehicle check.
Major Topics:	I. SAFETY GEAR AND SAFE LAB PRACTICES (3 hours, lecture)

- A. Shop tour, general safety practices
- B. Personal safety equipment
- C. OBDII code reader use and vehicle pre-scan

II. BOLT-ON PANEL REPLACEMENT AND ALIGNMENT (3 hours, lecture)

- A. Bolt-on panel alignment order and procedures
- B. How to check for proper alignment
- C. Using panel alignment to locate underlying damage
- D. Replacing or adjusting hinges and latches
- E. Removing and installing door handles
- F. (National Automotive Technicians Education Foundation (NATEF) Non-Structural Damage Analysis and Repair tasks: Section B, 1-9, 11-17)

III. BOLT-ON PANEL REPLACEMENT AND ALIGNMENT (15 hours, lab)

- A. Bolt-on panel alignment order and procedures
- B. How to check for proper alignment
- C. Using panel alignment to locate underlying damage
- D. Replacing or adjusting hinges and latches
- E. Removing and installing door handles
- F. (NATEF Non-Structural Damage Analysis and Repair tasks: Section B, 1-9, 11-17)

IV. MOVEABLE GLASS (3 hours, lecture)

- A. Laminated vs. safety glass
- B. Door glass removal and installation
- C. Sunroof/moonroof removal and installation
- D. Minivan tilt-out window removal, installation and adjustment
- E. (NATEF Non-Structural Damage Analysis and Repair tasks: Section D, numbers 1-5)

V. MOVEABLE GLASS (15 hours, lab)

- A. Laminated vs. safety glass
- B. Door glass removal and installation
- C. Sunroof/moonroof removal and installation
- D. Minivan tilt-out window removal, installation and adjustment
- E. (NATEF Non-Structural Damage Analysis and Repair tasks: Section D, numbers 1-5)

VI. ELECTRIC WELDING (6 hours, lecture)

- A. Safety practices
- B. Theory of electric welding
- C. Set up, use and disassembly of MIG welder
- D. Set up, use and care of STRSW welder
- E. (NATEF Non-Structural Damage Analysis and Repair tasks: Section E, numbers 1-19)
- F. (NATEF Structural Damage Analysis and Repair tasks: Section D, numbers 1-19)

VII. ELECTRIC WELDING (45 hours, lab)

- A. Safety practices
- B. Theory of electric welding

- C. Set up, use and disassembly of MIG welder
- D. Set up, use and care of STRSW welder
- E. (NATEF Non-Structural Damage Analysis and Repair tasks: Section E, numbers 1-19)
- F. (NATEF Structural Damage Analysis and Repair tasks: Section D, numbers 1-19)

VIII. VEHICLE COLLISION ANALYSIS AND THEORY (6 hours, lecture)

- A. Safety practices
- B. Theory of collision repair: blocking, holding and pulling torque boxes
- C. Measurement: tape measures, tram gauge, self-centering gauges, fixtures and adjustable jigs
- D. Identification of damage: side sways, sag, mash, diamond and twist
- E. (NATEF Non-Structural Damage Analysis and Repair tasks: Section A, numbers 1-10)

IX. VEHICLE COLLISION ANALYSIS AND THEORY (15 hours, lab)

- A. Safety practices
- B. Theory of collision repair: blocking, holding and pulling torque boxes
- C. Measurement: tape measures, tram gauge, self-centering gauges, fixtures and adjustable jigs
- D. Identification of damage: side sways, sag, mash, diamond and twist
- E. (NATEF Non-Structural Damage Analysis and Repair tasks: Section A, numbers 1-10)

X. NON-STRUCTURAL PANEL REPLACEMENT (6 hours, lecture)

- A. Safety practices and industry repair standards
- B. Determining the extent of the damage, repair vs. replace
- C. Drilling spot welds
- D. Replacement panel fit-up and measuring
- E. Panel installation by MIG and STRSW welding
- F. Finish grinding of weld beads

XI. NON-STRUCTURAL PANEL REPLACEMENT (30 hours, lab)

- A. Safety practices and industry repair standards
- B. Determining the extent of the damage, repair vs. replace
- C. Drilling spot welds
- D. Replacement panel fit-up and measuring
- E. Panel installation by MIG and STRSW welding
- F. Finish grinding of weld beads

XII. HYDRAULIC DENT REMOVAL (6 hours, lecture)

- A. Safety practices
- B. Pascal's Law of Hydraulics
- C. Porto-Power setup and accessories
- D. Use of Porto-Power for pushing and pulling damage
- E. Come-Along setup and safe use
- F. Power Post setup geometry and safe use

XIII. HYDRAULIC DENT REMOVAL (30 hours, lab)

- A. Safety practices
- B. Pascal's Law of Hydraulics
- C. Porto-Power setup and accessories
- D. Use of Porto-Power for pushing and pulling damage
- E. Come-Along setup and safe use
- F. Power Post setup geometry and safe use

XIV. DOOR SKINS (3 hours, lecture)

- A. Safety practices
- B. Removal of damaged door skin
- C. Test fit and installation of new skin
- D. Corrosion protection

XV. DOOR SKINS (30 hours, lab)

- A. Safety practices
- B. Removal of damaged door skin
- C. Test fit and installation of new skin
- D. Corrosion protection

XVI. PANEL BONDING (3 hours, lecture)

- A. Conditions and materials
- B. Part and surface preparation
- C. Procedures

XVII. PANEL BONDING (15 hours, lab)

- A. Conditions and materials
- B. Panel and surface preparation
- C. Procedures

XVIII. PLASTIC REPAIRS (3 hours, lecture)

- A. Plastic identification
- B. Part and surface preparation
- C. Repair using a plastic welder
- D. Repair using a hot stapler
- E. Repair using a 2-part adhesive and adhesive backing pad
- F. Finish sanding and prep for primer
- G. (NATEF Non-Structural Damage Analysis and Repair tasks: Section F, numbers 1-5)

XIX. PLASTIC REPAIRS (15 hours, lab)

- A. Plastic identification
- B. Part and surface preparation
- C. Repair using a plastic welder
- D. Repair using a hot stapler
- E. Repair using a 2-part adhesive and adhesive backing pad
- F. Finish sanding and prep for primer

	G. (NATEF Non-Structural Damage Analysis and Repair tasks: Section F, numbers 1-5) XX. ALUMINUM REPAIR (6 hours, lecture) A. Safety practices B. Galvanic corrosion, keeping steel and aluminum tools separate C. Aluminum characteristics vs. steel D. Dent removal using body picks, adhesive pull-out tools and weld-on draw pins. E. Corrosion protection and primer prep chemicals for aluminum XXI. ALUMINUM REPAIR (30 hours, lab) A. Safety practices B. Galvanic corrosion, keeping steel and aluminum tools separate C. Aluminum characteristics vs. steel D. Dent removal using body picks, adhesive pull-out tools and weld-on draw pins. E. Corrosion protection and primer prep chemicals for aluminum XXII. FINAL VEHICLE CHECK (6 hours, lecture) A. Using panel alignment to identify underlying damage B. Checking dash warning lights C. Checking for water/air/dust leaks D. Checking headlights and taillights E. OBDII post-scan F. Advanced Driver-Assistance Systems (ADAS) awareness XXIII. FINAL VEHICLE CHECK (30 hours, lab) A. Using panel alignment to identify underlying damage B. Checking dash warning lights C. Checking for water/air/dust leaks D. Checking headlights, taillights, door locks and power windows E. OBDII post-scan F. ADAS awareness
Total Lecture Hours:	54
Total Laboratory Hours:	270
Total Hours:	324
A.1. Primary Methods of Evaluation (Part 1 - CCN courses only):	
A.2. Primary Method of Evaluation (Part 2 - all courses; choose one):	3) Skills demonstration

Typical Assignment Using Primary Method of Evaluation:	Remove and install a hood, fender and front door. Align the panels for fit and flush with 3 mm panel gaps, and test the door for air- and water-tightness. Explain in a short essay how the concept of flushness affects cabin noise and customer perception of quality.
Critical Thinking Assignment 1:	In a one-page report, analyze and explain how a misaligned hood, fender and door on a repaired vehicle can indicate underlying damage issues that were not addressed. Justify your analysis of the vehicle by explaining why simply adjusting the bolt-on part cannot correct the alignment. Submit report to the instructor.
Critical Thinking Assignment 2:	Using simple identification techniques and a collision repair manual, determine if a damaged panel is mild steel, high strength steel, boron steel or aluminum. Create a one-page repair plan to either repair or replace the panel according to its condition. Submit repair plan to the instructor.
Other Evaluation Methods:	Class Performance, Completion, Homework Problems, Matching Items, Multiple Choice, Other Exams, Performance Exams, Quizzes
Instructional Methods:	Demonstration, Group Activities, Guest Speakers, Lab, Lecture, Multimedia presentations
If other:	
Work Outside of Class:	Answer questions, Problem solving activity, Required reading, Study
If Other:	
Up-To-Date Representative Texts:	Joe Baker. <u>Auto Collision Repair and Refinishing</u> . 4th edition. Goodheart-Willcox. 2025.
Alternative Texts:	
Required Supplementary Readings:	
Other Required Materials:	Leather gloves Safety glasses Ear protection Dust mask
Requisite:	Prerequisite
Category:	sequential
Requisite course(s): List both prerequisites and corequisites in this box.	Automotive Collision Repair/Painting-1A Automotive Collision Repair/Painting-4A
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	Ability to use hand, pneumatic, electric and hydraulic tools. ACRP 4A -Identify and use hand, pneumatic, electric and hydraulic tools used in industry. ACRP 1A -Identify and use hand, pneumatic, electric and hydraulic tools used in industry. Understand the difference between a full frame and unitized construction vehicle. ACRP 4A -Differentiate between a full frame and unitized construction vehicle and be able to identify by proper name the major parts, panels and structural components of each.

	ACRP 1A -Differentiate between a full frame and unitized construction vehicle. Ability to metal finish a damaged steel body panel back to its original contour using only hand tools and no fillers. ACRP 4A -Metal finish a damaged steel body panel back to its original condition using only hand tools and no fillers. ACRP 1A -Metal finish a damaged steel body panel back to its original condition using only hand tools and no fillers. Ability to grind a body panel surface for preparation for plastic filler. ACRP 4A -Grind a body panel surface for preparation for plastic filler. ACRP 1A -Grind a body panel surface for preparation for plastic filler.
Requisite Skill:	Prerequisite
Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable	If a student has taken an equivalent course at another college or has automotive collision repair experience, the student will be prepared to enroll in this course. Students must have collision repair experience in order to succeed in this course.
Requisite course:	
Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).	
Requisite Skill:	
Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable	
Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Kenneth Zion
Date:	09/01/1983
Original Board Approval Date:	
Last Reviewed and/or Revised by:	Patricia Fairchild

Date:	11/08/2025
Last Board Approval Date:	01/21/2026
Effective Term:	FA 2026