



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	ACRP
Course Number:	4D
Descriptive Title:	Intermediate Automotive Collision Repair II
Division:	Industry and Technology
Department:	Automotive Collision Repair/Painting
Course Disciplines:	Automotive Technology
Catalog Description:	This course introduces students to frame straightening and severe collision damage using the frame rack, power post, damage dozer, hydraulic jacks and Porto-Power. hydraulic ram. Topics covered include how to section a vehicle, replace damaged unibody structural panels and prepare replaced panels for rustproofing/refinishing. This course contains Inter-Industry Conference on Auto Collision Repair (I-CAR) Professional Development Program curriculum.
Prerequisite:	
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	2
Hours Laboratory (per week):	7
Outside Study Hours:	4
Total Course Hours:	162
Course Units:	4
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	2/17/2015
Transfer UC:	No
Effective Date:	
General Education:	ECC
Term:	
Other:	
CSU GE:	

	Term:	
	Other:	
	IGETC:	
	Term:	
	Other:	
Student Learning Outcomes:	SLO #1 Porto Power Students will be able to set up and use a Porto Power hydraulic ram and its attachments to remove a large panel dent or correct damage to a structural part. SLO #2 Pull Planning & Geometry Students will be able to analyze damage to a given vehicle, determine the sequence and direction of the impact's damage, and create a diagram and pull plan to correct the damage using the frame rack, Power Post or Pull Dozer. SLO #3 Anchoring a Vehicle for Pulling Students will be able to research and locate a given vehicle's anchor points for frame pulling, and choose the correct grade of chains and type of attachment accessories to anchor the vehicle to the floor or frame rack.	
Course Objectives:	1. Complete a comprehensive automotive collision repair/painting safety test with 100% 2. Safely position and secure a vehicle on the frame rack. Use a winch and spotters, practice good communication with your team. 3. Set up a computerized measuring system to check for damage on a unibody vehicle. Print a report showing the current vehicle measurements, note any measurements that are outside of specifications. Make an organized list of parts that will need to be repaired or replaced. 4. Measure a structurally damaged full-frame vehicle using a measuring tape, tram gauge, self-centering gauges or 3-D measuring system and record data. Use the data to plan a pull using the frame rack. 5. Measure a structurally damaged unibody vehicle using a tram gauge, self-centering gauges or 3-D measuring system and record data. Use the data to plan a pull using the frame rack. 6. Compare and contrast the safety, strength, speed of setup, speed of use, and accuracy of repair of the frame rack, damage dozer, power post and Porto-Power.	
Major Topics:	I. PERSONAL SAFETY AND SAFE LAB PRACTICES (4 hours, lecture) A. Shop tour B. General safety practices & personal safety equipment II. STRUCTURAL VEHICLE PARTS & MEASUREMENT REVIEW (4 hours, lecture) A. Full-frame vehicle construction and structural parts	

- B. Unibody vehicle construction and structural parts
- C. Using and reading measurement equipment
- D. Using printed and computerized vehicle specifications resources
- E. (National Automotive Technicians Education Foundation (NATEF) Structural Analysis and Repair tasks: Section A, numbers 1, 13-17; Section B, numbers 1, 3-7, 15, 16, 20, 21)

III. STRUCTURAL VEHICLE PARTS & MEASUREMENT REVIEW (14 hours, lab)

- A. Full-frame vehicle construction and structural parts
- B. Unibody vehicle construction and structural parts
- C. Using and reading measurement equipment
- D. Using printed and computerized vehicle specifications resources
- E. (NATEF Structural Analysis and Repair tasks: Section A, numbers 1, 13-17; Section B, numbers 1, 3-7, 15, 16, 20, 21)

IV. HYDRAULIC JACKS & PORTO-POWER (4 hours, lecture)

- A. Principles of hydraulic force
- B. Using hydraulic jacks
- C. Using Porto-Power and accessories to push
- D. Using Porto-Power and accessories to hold
- E. Using Porto-Power and accessories to pull

V. HYDRAULIC JACKS & PORTO-POWER (14 hours, lab)

- A. Principles of hydraulic force
- B. Using hydraulic jacks
- C. Using Porto-Power and accessories to push
- D. Using Porto-Power and accessories to hold
- E. Using Porto-Power and accessories to pull

VI. POWER POST & DAMAGE DOZER (4 hours, lecture)

- A. Safe use of equipment, accessories and anchoring system
- B. Positioning and anchoring a vehicle for repair
- C. Planning and performing a pull
- D. Checking repair by comparing measurements to specifications
- E. Comparing measurements made under tension and at rest

VII. POWER POST & DAMAGE DOZER (14 hours, lab)

- A. Safe use of equipment, accessories and anchoring system
- B. Positioning and anchoring a vehicle for repair
- C. Planning and performing a pull
- D. Checking repair by comparing measurements to specifications
- E. Comparing measurements made under tension and at rest

VIII. FRAME RACK (8 hours, lecture)

- A. Parts, accessories and safe use of frame rack
- B. Positioning and anchoring a vehicle on frame rack

- C. Determining direction of damage
- D. Full-frame vs. unibody anchoring and pulls
- E. Planning a pull using one post
- F. Planning a multi-post pull
- G. Using posts for holding
- H. Comparing measurements under tension and at rest
- I. (NATEF Structural Analysis and Repair tasks: Section A, numbers 2-12, 18; Section B, numbers 2, 8-14, 17-19, 22)

IX. FRAME RACK (28 hours, lab)

- A. Parts, accessories and safe use of frame rack
- B. Positioning and anchoring a vehicle on frame rack
- C. Determining direction of damage
- D. Full-frame vs. unibody anchoring and pulls
- E. Planning a pull using one post
- F. Planning a multi-post pull
- G. Using posts for holding
- H. Comparing measurements under tension and at rest
- I. (NATEF Structural Analysis and Repair tasks: Section A, numbers 2-12, 18; Section B, numbers 2, 8-14, 17-19, 22)

X. THREE-DIMENSIONAL & COMPUTER MEASURING SYSTEMS (8 hours, lecture)

- A. Parts, accessories and setup of three-dimensional measuring system
- B. Parts, accessories and setup of Genesis computer measuring system
- C. Comparing vehicle measurements to specs and tolerances
- D. Reporting non-compliant specs and planning a pull to correct damage

XI. THREE-DIMENSIONAL & COMPUTER MEASURING SYSTEMS (28 hours, lab)

- A. Parts, accessories and setup of three-dimensional measuring system
- B. Parts, accessories and setup of Genesis computer measuring system
- C. Comparing vehicle measurements to specs and tolerances
- D. Reporting non-compliant specs and planning a pull to correct damage

XII. VEHICLE SECTIONING & ALIGNMENT (4 hours, lecture)

- A. Referencing vehicle manufacturer recommendations for proper vehicle sectioning
- B. Determining safe parts repair vs. replacement
- C. Removing damaged parts and panels
- D. Preparation, positioning and clamping of replacement panels
- E. Welding replacement panels
- F. Verification of alignment by measuring
- G. Preparing panels for rustproofing and refinishing
- H. (NATEF Structural Analysis and Repair tasks: Section C, numbers 1-3)

XIII. VEHICLE SECTIONING & ALIGNMENT (28 hours, lab)

	A. Referencing vehicle manufacturer recommendations for proper vehicle sectioning B. Determining safe parts repair vs. replacement C. Removing damaged parts and panels D. Preparation, positioning and clamping of replacement panels E. Welding replacement panels F. Verification of alignment by measuring G. Preparing panels for rustproofing and refinishing H. (NATEF Structural Analysis and Repair tasks: Section C, numbers 1-3)
Total Lecture Hours:	36
Total Laboratory Hours:	126
Total Hours:	162
Primary Method of Evaluation:	3) Skills demonstration
Typical Assignment Using Primary Method of Evaluation:	With a team, set up a computerized measuring system to check for damage on a unibody vehicle. Print a report showing the current vehicle measurements, note any measurements that are outside of specifications. Make an organized list of parts that will need to be repaired or replaced.
Critical Thinking Assignment 1:	With a team, set up a computerized measuring system to check for damage on a unibody vehicle. Print a report showing the current vehicle measurements, note any measurements that are outside of specifications. Make an organized list of parts that will need to be repaired or replaced.
Critical Thinking Assignment 2:	In a small group, compare and contrast the safety, strength, speed of setup, speed of use and accuracy of repair of the frame rack, damage dozer, power post and Porto-Power. Report your results and recommendations to the class in a ten-minute oral presentation.
Other Evaluation Methods:	Class Performance, Completion, Laboratory Reports, Multiple Choice, Objective Exam, Performance Exams, Quizzes
Instructional Methods:	Demonstration, Discussion, Group Activities, Guest Speakers, Lab, Lecture
If other:	
Work Outside of Class:	Answer questions, Required reading, Study
If Other:	
Up-To-Date Representative Textbooks:	Joe Baker. <u>Auto Collision Repair and Refinishing</u> . 4th ed. The Goodheart-Willcox Company, Inc., 2025.
Alternative Textbooks:	
Required Supplementary Readings:	
Other Required Materials:	Safety Glasses Leather Gloves Ear Protection

Requisite:	
Category:	
Requisite course(s): List both prerequisites and corequisites in this box.	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
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Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Patricia Fairchild
Date:	12/26/2013
Original Board Approval Date:	02/17/2015
Last Reviewed and/or Revised by:	Patricia Fairchild
Date:	12/01/2024
Last Board Approval Date:	01/21/2026 eff FA 2026

Course Acronym:	ACRP
Course Number:	4C
Descriptive Title:	Intermediate Automotive Collision Repair I
Division:	Industry and Technology
Department:	Automotive Collision Repair/Painting
Course Disciplines:	Automotive Technology
Catalog Description:	This course provides instruction in structural plastic repair, surface and structural repair of fiberglass and composites, aluminum repair and surface treatment for refinishing, vehicle frame and structural parts nomenclature, frame and unibody damage identification and measurement, structural damage estimating, and replacement panel fitment and alignment. This course contains Inter-Industry Conference on Auto Collision Repair (I-CAR) Professional Development Program curriculum.
Prerequisite:	
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	2
Hours Laboratory (per week):	7
Outside Study Hours:	4
Total Course Hours:	162
Course Units:	4
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	Proposed
Transfer UC:	No
Effective Date:	
General Education: ECC	
Term:	
Other:	
CSU GE:	
Term:	
Other:	
IGETC:	
Term:	

Other:	
Student Learning Outcomes:	SLO #1 Plastic Repair Students will be able to locate a plastic part's type code and choose the appropriate repair method, tools, and materials. Students will then be able to apply the method and perform the repair. 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 Structural Parts Students will be able to locate and properly name major unibody vehicle structural parts and assemblies.
Course Objectives:	1. Complete a comprehensive automotive collision repair/painting safety test with 100% accuracy. 2. Perform a structural (two-sided) repair on a plastic part such as a bumper cover using a plastic welder, hot stapler or 2-part adhesive with reinforcement backing pad. 3. Perform a small dent repair on an aluminum body panel using hammer and dolly, oxygen-acetylene torch or induction heater. Metal finish the repair and coat with a corrosion-protective chemical suitable for aluminum. 4. Analyze a bolt-on panel's fitment on a vehicle. Determine if any misalignment present is due to incorrect installation, incorrect repair to the part, or prior damage to the vehicle. Create a step-by-step plan of what should be done to correct the misalignment. 5. Identify and describe the five types of frame damage a full-frame vehicle can incur. 6. Measure a structurally damaged unibody vehicle using a measuring tape or tram gauge and record data. Use the data to plan a pull using a power post.
Major Topics:	I. PERSONAL SAFETY AND SAFE LAB PRACTICES (4 hours, lecture) 1. Shop tour 2. General safety practices and personal safety equipment II. PLASTIC REPAIR (4 hours, lecture) A. Plastic types B. Repair tools and methods C. Adhesives and chemicals for repair D. Single and double-sided repairs E. 'Missing pieces' and live hinge repairs F. (National Automotive Technicians Education Foundation (NATEF) Non-Structural Analysis and Repair tasks: Section F, numbers 1-5)

III. PLASTIC REPAIR (14 hours, lab)

- A. Plastic types
- B. Repair tools and methods
- C. Adhesives and chemicals for repair
- D. Single and double-sided repairs
- E. 'Missing pieces' and live hinge repairs
- F. (NATEF Non-Structural Analysis and Repair tasks: Section F, numbers 1-5)

IV. COMPOSITES - FIBERGLASS (4 hours, lecture)

- A. Fiberglass part construction and materials
- B. Fiberglass crack repair
- C. Fiberglass 'missing piece' repair
- D. Fiberglass shaping and finishing
- E. Moldmaking and fiberglass part production

V. COMPOSITES - FIBERGLASS (28 hours, lab)

- A. Fiberglass part construction and materials
- B. Fiberglass crack repair
- C. Fiberglass 'missing piece' repair
- D. Fiberglass shaping and finishing
- E. Moldmaking and fiberglass part production

VI. COMPOSITES - CARBON FIBER (4 hours, lecture)

- A. Carbon fiber materials and parts construction
- B. Advantages/disadvantages of carbon fiber for automotive use
- C. Carbon fiber repair
- D. Moldmaking and part production

VII. COMPOSITES - CARBON FIBER (14 hours, lab)

- A. Carbon fiber materials and parts construction
- B. Advantages/disadvantages of carbon fiber for automotive use
- C. Carbon fiber repair
- D. Moldmaking and part production

VIII. ALUMINUM REPAIR (4 hours, lecture)

- A. Characteristics of aluminum as compared to steel
- B. Where to find aluminum components on a vehicle
- C. Aluminum dent repair
- D. Special preparation for refinishing/rust prevention
- E. Special considerations for mounting/attaching aluminum parts and panels
- F. (NATEF Non-Structural Analysis and Repair tasks: Section C, numbers 9, 10)

IX. ALUMINUM REPAIR (14 hours, lab)

- A. Characteristics of aluminum as compared to steel
- B. Where to find aluminum components on a vehicle

- C. Aluminum dent repair
- D. Special preparation for refinishing/rust prevention
- E. Special considerations for mounting/attaching aluminum parts and panels
- F. (NATEF Non-Structural Analysis and Repair tasks: Section C, numbers 9, 10)

X. BOLT-ON PANELS (4 hours, lecture)

- A. Removal and safe installation
- B. Alignment
- C. Identifying poor fitment causes and corrections
- D. Identifying vehicle damage by panel misalignment
- E. (NATEF Non-Structural Analysis and Repair tasks: Section B, numbers 1-9; Section D, numbers 1-5)

XI. BOLT-ON PANELS (14 hours, lab)

- A. Removal and safe installation
- B. Alignment
- C. Identifying poor fitment causes and corrections
- D. Identifying vehicle damage by panel misalignment
- E. (NATEF Non-Structural Analysis and Repair tasks: Section B, numbers 1-9; Section D, numbers 1-5)

XII. STRUCTURAL VEHICLE PARTS (4 hours, lecture)

- A. Full frame structural parts nomenclature and identification
- B. Unibody structural parts nomenclature and identification
- C. Structural part material identification
- D. Identifying damage
- E. Repair or replace

XIII. STRUCTURAL VEHICLE PARTS (14 hours, lab)

- A. Full frame structural parts nomenclature and identification
- B. Unibody structural parts nomenclature and identification
- C. Structural part material identification
- D. Identifying damage
- E. Repair or replace

XIV. VEHICLE DAMAGE TYPES (4 hours, lecture)

- A. Five damage types: side sway, kick-up/sag, mash, twist, diamond
- B. Identifying frame damage by visual cues
- C. Identifying frame damage by centering gauges
- D. Installing and using centering gauges
- E. Identifying frame damage by tram gauges
- F. Using tram gauges

XV. VEHICLE DAMAGE TYPES (14 hours, lab)

- A. Five damage types: side sway, kick-up/sag, mash, twist, diamond
- B. Identifying frame damage by visual cues

	C. Identifying frame damage by centering gauges D. Installing and using centering gauges E. Identifying frame damage by tram gauges F. Using tram gauges XVI. STRUCTURAL DAMAGE ESTIMATING (4 hours, lecture) A. Handwritten estimating B. Using estimating software C. Considerations for frame rack setup, measuring and pulling D. Repair/replace considerations and safety laws E. Determining a vehicle's value, 'totaling' a vehicle XVII. STRUCTURAL DAMAGE ESTIMATING (14 hours, lab) A. Handwritten estimating B. Using estimating software C. Considerations for frame rack setup, measuring and pulling D. Repair/replace considerations and safety laws E. Determining a vehicle's value, 'totaling' a vehicle
Total Lecture Hours:	36
Total Laboratory Hours:	126
Total Hours:	162
Primary Method of Evaluation:	3) Skills demonstration
Typical Assignment Using Primary Method of Evaluation:	Remove a small dent in an aluminum panel with no rear access (such as a hood) and prepare the area for primer application. Present the finished repair to the instructor for evaluation.
Critical Thinking Assignment 1:	Using a torn plastic bumper cover, determine the type of plastic the cover is made of, reference the correct repair method, and perform the repair so the cover is at least as strong as an undamaged cover. Finish the face of the cover in the repair area for primer.
Critical Thinking Assignment 2:	Given a poorly-fitting bolt-on panel such as a door, determine the cause of the misalignment (front/back, in/out, up/down, and/or misalignment of adjacent panels), make specific recommendations for correcting the misalignment, and explain in a one-page report or a five-minute oral presentation why you made the recommendations you did.
Other Evaluation Methods:	Class Performance, Completion, Laboratory Reports, Multiple Choice, Objective Exam, Performance Exams, Quizzes
Instructional Methods:	Demonstration, Discussion, Group Activities, Guest Speakers, Lab, Lecture
If other:	
Work Outside of Class:	Answer questions, Observation of or participation in an activity related to course content (such as theatre event, museum, concert, debate, meeting), Required reading, Study
If Other:	

Up-To-Date Representative Textbooks:	Joe Baker. <u>Auto Collision Repair and Refinishing</u> . 4th ed. The Goodheart-Willcox Company, Inc., 2025.
Alternative Textbooks:	
Required Supplementary Readings:	
Other Required Materials:	Safety Glasses Leather Gloves Ear protection
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Requisite course(s): List both prerequisites and corequisites in this box.	
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Enrollment Limitations and Category:	
Enrollment Limitations Impact:	

Course Created by:	Patricia Fairchild
Date:	10/24/2013
Original Board Approval Date:	10/19/2015
Last Reviewed and/or Revised by:	Patricia Fairchild
Date:	12/01/2024
Last Board Approval Date:	01/21/2026 eff FA 2026