

COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Non-Structural Analysis and Damage Repair 1
COURSE NUMBER	ACRT 0120
DIVISION	Career and Technical Education
DEPARTMENT	ACRT
CIP CODE	47.0603
CREDIT HOURS	4
CONTACT HOURS/WEEK	Class: 1.5 Lab: 5 Clinical: X
PREREQUISITES	ACRT 0100 - Safety & Orientation ACRT 0101 – OSHA 10
COREQUISITES	None
COURSE PLACEMENT	None

COURSE DESCRIPTION

Through a variety of classroom and/or shop/lab learning and assessment activities, students in this course will: explore the components of safety pertaining to auto collision and repair; explore the parts and construction of vehicles; explore opportunities in the auto collision industry; identify metal straightening techniques; identify the application and use of body fillers; demonstrate proper use, set-up and storage of welding equipment; distinguish between weldable and non-weldable materials; demonstrate fundamental industry standard recommended welds; identify plastics and adhesives used in automotive industry; explain the general purpose of damage, estimation and repair orders; explore the processes required for outer body panel repairs, replacements and adjustments; and demonstrate fundamental cutting procedures.

PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:

https://kansasregents.org/workforce_development/program-alignment

PROGRAM LEARNING OUTCOMES

1. Demonstrate adherence to safety and pollution prevention standards according to OSHA and EPA regulations.
2. Demonstrate the ability to communicate effectively in workplace scenarios with an appropriate level of preparedness for daily tasks and assignments.
3. Demonstrate the ability to execute panel preparation, application of refinishing materials, and removal of paint defects.

TEXTBOOKS

<http://kckccbookstore.com/>

METHOD OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Preparation
- II. Outer Body Panel Repairs, Replacements, and Adjustments
- III. Metal Finishing and Body Filling
- IV. Metal Welding and Cutting
- V. Plastics and Adhesives
- VI. Safety Precautions

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Explore the components of safety pertaining to auto collision and repair
 1. Identify safety standards for the collision repair industry
 2. Identify safety equipment
 3. Identify hazardous materials related to the collision repair industry
 4. Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations. (HP-I)(4.A.1)(EDS02 module 1 REF01 module 4 REF03 modules 2,4 WKR01 module3).
 5. Identify safety and personal health hazards according to OSHA guidelines and the Right to Know Law. (HP-I)(4.A.2)(WKR01 module1).
- B. Explore the parts and construction of vehicles
 6. Identify differences between unibody and frame vehicles.
 7. Identify differences between various powertrain configurations.
 8. Identify the major body parts and components of a vehicle.
- C. Explore opportunities in the auto collision industry
 9. Discuss different employment opportunities needed for auto collision repair industry.
 10. Discuss other related job opportunities needed for the auto collision repair industry.
- D. Identify metal straightening techniques
 11. Determine the extent of direct and indirect damage and direction of impact; develop and document a repair plan. (HP-I)(2.B.1)(DAM01 v.2.4 modules 1,2 DAM01 v.2.5 modules1,2,3,4,EXT01 module01).
 12. Remove paint from the damaged area of a body panel. (HP-I)(2.C.1)(EDS01 module 3STS01 module 2).

13. Locate and reduce surface irregularities on a damaged body panel. (HP-I)(2.C.2)(DAM02v.2.1 module 3 DAM02 v.2.2 module 2 EDS01 module 2,3,4 FCR01 v.2.1 module 2 FCR01 v.2.2 module 3 STS01 module 1,2).
 14. Demonstrate hammer and dolly techniques. (HP-I)(2.C.3)(EDS01 module 2 STS01 module 2).
 15. Determine the proper metal finishing techniques for aluminum. (HP-G)(2.C.9)(DAM 05 module2 STA01 modules 2,3).
 16. Determine the extent of damage to aluminum body panels; repair or replace. (HP-G) (2.B.3)(DAM05 module 2 PRA 01modules 1,2,3,4,5 STA01 modules 2,3).
- E. Identify the application and use of body fillers
17. Remove paint from the damaged area of a body panel. (HP-I)(2.C.1)(EDS01 module 3 STS01 module 2).
 18. Locate and reduce surface irregularities on a damaged body panel. (HP-I)(2.C.2) DAM02 v.2.1 module 3 DAM02 v.2.2 module 2 EDS01 module 2,3,4 FCR01 v.2.1 module 2 FCR01 v.2.2 module 3 STS01 module 1,2.
 19. Demonstrate hammer and dolly techniques. (HP-I)(2.C.3)(EDS01 module 2 STS01 module 2).
 20. Mix body filler. (HP-I)(2.C.6)(EDS01 module 3 STS01 module 2).
 21. Apply body filler; shape during curing. (HP-I)(2.C.7)(EDS01 module 3 STS01 module 2).
 22. Rough sand cured body filler to contour; finish sand. (HP-I)(2.C.8)((EDS01 module 2 STS01 module 2).
- F. Demonstrate proper use, set-up and storage of welding equipment
23. Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation. (HP-I)(2.E.4)(EXT02 module 1 WCS01module 1).
 24. 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. (HP-I)(2.E.5)(WCS01 module 1).
 25. Store, handle, and install high-pressure gas cylinders. (HP-I)(2.E.6)(WCS01 module 1).
 26. Determine work clamp (ground) location and attach. (HP-I)(2.E.7)WCS01v.1.2 module 1.
 27. Identify different methods of attaching non-structural components (squeeze type resistant spot welds (STRSW), riveting, non-structural adhesive, silicon bronze, etc.) (HP-G)(2.E.19)(ADH01 v.1.2 module 1 ADH01 V.1.3 modules 1,2,4 EXT02 modules 1,2,3,4,5 WCS04 v.2.1 modules 1,2,3 WCS04 v.2.2 modules 1,2,3,4).
- G. Distinguish between weldable and non-weldable materials
28. Identify weldable and non-weldable materials used in collision repair. (HP-I)(2.E.1) EXT02 module 1 WCS01 module 1).
- H. Demonstrate fundamental industry standard recommended welds

29. Weld and cut high-strength steel and other steels. (HP-I)(2.E.2)(EXT02 module 1 WCS01 v.1.2 modules 1,2,3,4 WCS01v.1.3 modules 1,2,3,4,5).
 30. Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation. (HP-I)(2.E.4)(EXT02 module 1 WCS01 module 1).
 31. 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. (HP- I)(2.E.5)(WCS01 module 1).
 32. Store, handle, and install high-pressure gas cylinders. (HP-I)(2.E.6)(WCS01 module 1).
 33. Determine work clamp (ground) location and attach. (HP-I)(2.E.7)WCS01v.1.2 module 1.
 34. 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. (HP-I)(2.E.8) (WCS01 v.1.2 module 1 WCS01 v.1.3 modules 1,2,3,4,5).
 35. Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required. (HP-I)(2.E.11) (WCS01 v.1.2 module 1).
 36. Determine the joint type (butt weld with backing, lap, etc.) for weld being made. (HP-I) (2.E.12)(WCS02 modules 1,2,3,4,5).
 37. Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation. (HP-I)(2.E.13)(WCS02 modules 1,2,3,4,5).
 38. Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and fillet. (HP-I)(2.E.14)(WCS01 v.1.2 modules 2,3,4).
 39. Identify the causes of various welding defects; make necessary adjustments. (HP-I)(2.E.16)(WCS01 v.1.2 module 1).
 40. Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments. (HP-I)(2.E.17)(WCS01 module 1).
- I. Identify plastics and adhesives used in automotive industry
41. Identify the types of plastics; determine repairability. (HP-I)(2.F.1)(DAM02 module 2 PLA01 modules 1,3 PLA02 modules 1,4).
 42. Identify the types of plastic repair procedures; clean and prepare the surface of Plastic parts. (HP-I)(2.F.2)(PLA01 modules 1,2 PLA 02 modules 1,2).
- J. Explain the general purpose of damage, estimation and repair orders
43. Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan. (HP-I)(2.A.1)(DAM01 v.2.4 modules 1,2 DAM01 v.2.5 modules 1,2,3,4,5 EXT01 module 1).
- K. Explore the processes required for outer body panel repairs, replacements and adjustments
44. Determine the extent of direct and indirect damage and direction of impact; develop and document a repair plan. (HP-I)(2.B.1)(DAM01 v.2.4 modules 1,2 DAM01 v.2.5 modules1,2,3,4,EXT01 module01).
 45. Inspect, remove and replace bolted, bonded, and welded steel panel or panel assemblies. (HP-I)(2.B.2)(ADH01 v.1.2 module 1 ADH01 v.1.3modules 1,2,3 DAM02

v.2.1 modules 1,2,3 DAM02 v.2.2 module 2 EXT01 modules 1,2,3,4 EXT02 modules 1,2,3,4,5).

46. Determine the extent of damage to aluminum body panels; repair or replace. (HP-G)(2.B.3)(DAM05 module 2 PRA 01 modules 1,2,3,4,5 STA01 modules 2,3).
 47. Inspect, remove, replace, and align hood, hood hinges, and hood latch. (HP-I)(2.B.4)(DAM02 v.2.1 module 3 DAM02 v.2.2 module 2 EXT01 module 2).
 48. Inspect, remove, replace, and align deck lid, lid hinges, and lid latch. (HP-I)(2.B.5)(DAM04 module 3 EXT01 module 4).
 49. Inspect, remove, replace, and align doors, tailgates, hatches, lift gates, latches, hinges, and related hardware. (HP-I)(2.B.6)(DAM04 modules 2,3 EXT01 modules 3,4 EXT02 module 2).
 50. Inspect, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware. (HP-I)(2.B.7)(DAM02 module 2 EXT01 module 2 EXT02 module 5).
 51. The student will be able to inspect, remove, replace and align front fenders, headers, and other panels. (HP-I)(2.B.8)(DAM02 v.2.1 module 3 DAM02 v.2.2 module 2 EXT01 module 2 EXT02 module 5).
- L. Demonstrate fundamental cutting procedures
52. Weld and cut high-strength steel and other steels. (HP-I)(2.E.2)(EXT02 module 1 WCS01 v.1.2 modules 1,2,3,4 WCS01v.1.3 modules 1,2,3,4,5).
 53. Weld and cut aluminum. (HP-G)(2.E.3)(WCS01 modules 1,2).
 54. Store, handle, and install high-pressure gas cylinders. (HP-I)(2.E.6)(WCS01 module 1).
 55. Identify cutting process for different materials and locations perform cutting operation. (HP-I)(2.E.18)(WCS05 module 4).

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.

