

## SYLLABUS

**DATE OF LAST REVIEW:** 09/2019

**CIP CODE:** 47.0603

**SEMESTER:** Departmental Syllabus

**COURSE TITLE:** Non-Structural Analysis and Damage Repair 2

**COURSE NUMBER:** ACRT0220

**CREDIT HOURS:** 4

**INSTRUCTOR:** Departmental Syllabus

**OFFICE LOCATION:** Departmental Syllabus

**OFFICE HOURS:** Departmental Syllabus

**TELEPHONE:** Departmental Syllabus

**E-MAIL:** KCKCC issued email accounts are the official means for electronically communicating with our students.

**PREREQUISITE(S):** ACRT0100, ACRT0120

**REQUIRED TEXT AND MATERIALS:** Please check with the KCKCC bookstore, <http://www.kckccbookstore.com/>, for the required texts for your particular class.

**COURSE DESCRIPTION:** Upon completion of this course the student will be able to use basic metal working skills to repair damaged panels back to their original shape. The removal, replacement and adjustment of exterior panels and welding and cutting procedures are areas that the student will master. Identifying mechanical and electrical components and determining correct procedures for working with plastic and adhesives will be introduced. Live customer work will be introduced.

**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. 2.A Preparation
- II. 2.B Outer Body Panel Repairs, Replacements, and Adjustments
- III. 2.C Metal Finishing and Body Filling
- IV. 2.E Metal Welding and Cutting
- V. 2.F Plastics and Adhesives
- VI. 4.A Safety Precautions

**EXPECTED LEARNER OUTCOMES:**

- A. The student will be able to identify trim and hardware to be protected
- B. The student will be able to examine what to consider when working with movable glass
- C. The student will be able to perform outer body panel repairs
- D. The student will be able to perform outer body replacements and adjustments
- E. The student will be able to perform metal straightening techniques
- F. The student will be able to perform body filling techniques
- G. The student will be able to perform metal finishing techniques
- H. The student will be able to use welding procedures in non-structural damage repair
- I. The student will be able to distinguish between mechanical and electrical components
- J. The student will be able to apply safety standards for the collision repair industry
- K. The student will be able to use cutting procedures in non-structural damage repair
- L. The student will be able to determine procedures necessary for working with plastics and adhesives

**COURSE COMPETENCIES:** The student will be able to demonstrate competence in the classroom or classroom shop setting and by meeting any institution-required NATEF Tasks from the criteria outlined below. NATEF Guidelines of: 95% of HP-I items must be taught in the curriculum; 90% of HP-G items must be taught in the curriculum

*The student will be able to identify trim and hardware to be protected*

**(Linked External Standards 2.A Preparation)**

- 1. The student will be able to inspect, remove, store, and replace exterior trim and moldings. (HP-I)(2.A.2)(DAM04 v.2.1 module 4 DAM04 v.2.2 module 3 TRM01 modules 3,6,7)
- 2. The student will be able to inspect, remove, store, and replace interior trim and components. (HP-I)(2.A.3)(DAM04 v.2.1 module 1 DAM04 v.2.2 modules 1,2 TRM01 module 5)
- 3. The student will be able to inspect, remove, and replace repairable plastics and other components that are recommended for off-vehicle repair. (HP-I)(2.A.9)(DAM02 v.2.1 module 2 DAM02 v.2.2 module 1 EXT01 modules 1,2,3,4 Ext02 modules 1,2,3,4,5)

*The student will be able to examine what to consider when working with movable glass*

**(Linked External Standards 2.A Preparation, 2.E Metal Welding and Cutting)**

- 4. The student will be able to protect panels, glass, and parts adjacent to the repair area. (HP-I)(2.A.6)(EXT01 module 1 EXT02 modules 1,2,3,4,5)

5. The student will be able to protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations. (HP-I)(2.E.9)(DAM02 v.2.1 module 2 DAM02 v.2.2 module 1 EXT01 modules 1,2,3,4 Ext02 modules 1,2,3,4,5)

*The student will be able to perform outer body panel repairs*

**(Linked External Standards 2.B Outer Body Panel Repairs, Replacements, and Adjustments)**

6. The student will be able to 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 modules 1,2,3,4,EXT01 module 01)
7. The student will be able to 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)
8. The student will be able to straighten and rough-out contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pull attachments. (HP-I)(2.B.9)(EDS01 modules 2,3 STS01 module 2)
9. The student will be able to weld damaged or torn steel body panels; repair broken welds. (HP-I)(2.B.10)(EDS01 module 3)

*The student will be able to perform outer body replacements and adjustments*

**(Linked External Standards 2.B Outer Body Panel Repairs, Replacements, and Adjustments)**

10. The student will be able to 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 modules 1,2,3,4,EXT01 module 01)
11. The student will be able to 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.1.3 modules 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)
12. The student will be able to 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)
13. The student will be able to inspect, remove, replace, and align hood, hood hinges, and hood latch. (HP-I)(2.B.4)(DAM05 module 2 PRA 01 modules 1,2,3,4,5 STA01 modules 2,3)
14. The student will be able to inspect, remove, replace, and align deck lid, lid hinges, and lid latch. (HP-I)(2.B.5) (DAM04 module 3 EXT01 module 4)
15. The student will be able to 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)
16. The student will be able to 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)
17. 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)

18. The student will be able to diagnose and repair water leaks, dust leaks, and wind noise. (HP-G)(2.B.15)(WNW01 modules 1,2,3)

*The student will be able to perform metal straightening techniques*

**(Linked External Standards 2.B Outer Body Panel Repairs, Replacements, and Adjustments, 2.C Metal Finishing and Body Filling)**

19. The student will be able to 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 modules 1,2,3,4,EXT01 module 01)
20. The student will be able to 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)
21. The student will be able to straighten and rough-out contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pull attachments. (HP-I) (2.B.9)(EDS01 modules 2,3 STS01 module 2)
22. The student will be able to remove paint from the damaged area of a body panel. (HP-I)(2.C.1)(EDS01 module 3 STS01 module 2)
23. The student will be able to 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)
24. The student will be able to demonstrate hammer and dolly techniques. (HP-I)(2.C.3)(EDS01 module 2 STS01 module 2)
25. The student will be able to determine the proper metal finishing techniques for aluminum. (HP-G)(2.C.9)(DAM 05 module 2 STA01 modules 2)

*The student will be able to perform body filling techniques*

**(Linked External Standards 2.C Metal Finishing and Body Filling)**

26. The student will be able to remove paint from the damaged area of a body panel. (HP-I)(2.C.1)(EDS01 module 3 STS01 module 2)
27. The student will be able to 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)
28. The student will be able to mix body filler. (HP-I)(2.C.6)(EDS01 module 3 STS01 module 2)
29. The student will be able to apply body filler; shape during curing. (HP-I)(2.C.7)(EDS01 module 3 STS01 module 2)
30. The student will be able to rough sand cured body filler to contour; finish sand. (HP-I)(2.C.8)(EDS01 module 3 STS01 module 2)
31. The student will be able to determine the proper metal finishing techniques for aluminum. (HP-G)(2.C.9)(DAM 05 module 2 STA01 modules 2,3)
32. The student will be able to determine proper application of body filler to aluminum. (HP-G)(2.C.10)(PRA01 modules 3,5 STA01 module 2)

*The student will be able to perform metal finishing techniques*

**(Linked External Standards 2.C Metal Finishing and Body Filling)**

33. The student will be able to remove paint from the damaged area of a body panel. (HP-I)(2.C.1)(EDS01 module 3 STS01 module 2)
34. The student will be able to 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)
35. The student will be able to demonstrate hammer and dolly techniques. (HP-I)(2.C.3)(EDS01 module 2 STS01 module 2)
36. The student will be able to heat shrink stretched panel areas to proper contour. (HP-I)(2.C.4)(EDS01 module 2 STS01 module 2)
37. The student will be able to cold shrink stretched panel areas to proper contour. (HP-I)(2.C.5)(EDS01 module 2 STS01 module 2)
38. The student will be able to determine the proper metal finishing techniques for aluminum. (HP-G)(2.C.9)(DAM 05 module 2 STA01 modules 2,3)

*The student will be able to use welding procedures in non-structural damage repair*  
**(Linked External Standards 2.E Metal Welding and Cutting)**

39. The student will be able to identify weldable and non-weldable materials used in collision repair. (HP-I)(2.E.1)
40. The student will be able to 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 WCS01 v.1.3 modules 1,2,3,4,5)
41. The student will be able to weld and cut aluminum. (HP-G)(2.E.3)(WCS01 modules 1,2)
42. The student will be able to 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)
43. The student will be able to 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)
44. The student will be able to store, handle, and install high-pressure gas cylinders. (HP-I)(2.E.6)(WCS01 module 1)
45. The student will be able to determine work clamp (ground) location and attach. (HP-I)(2.E.7)(WCS01 v.1.2 module 1)
46. The student will be able to 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)
47. The student will be able to protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations. (HP-I)(2.E.9)EXT02 modules 1,2,3,4,5 WCS01 module 1)
48. The student will be able to protect computers and other electronic control modules during welding procedures. (HP-I) (2.E.10)(WCS01 module 1)
49. The student will be able to 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)
50. The student will be able to 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)

51. The student will be able to 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)
52. The student will be able to 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)
53. The student will be able to perform visual and destructive tests on each weld type. (HP-I)(2.E.15)(WCS01 v.1.2 modules 2,3,4)
54. The student will be able to identify the causes of various welding defects; make necessary adjustments. (HP-I)(2.E.16) (WCS01 v.1.2 module 1)
55. The student will be able to identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments. (HP-I)(2.E.17)(WCS01 module 1)
56. The student will be able to 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)

*The student will be able to distinguish between mechanical and electrical components*  
**(Linked External Standards 2.A Preparation, 2.E Metal Welding and Cutting)**

57. The student will be able to 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)
58. The student will be able to inspect, remove, store, and replace all vehicle mechanical and electrical components that may interfere with or be damaged during repair. (HP-G)(2.A.5)(DAM03 v.2.2 modules 1,2,3,4,5,6 DAM03 v.2.4 modules 1,7 DAM04 modules 1,2,3 Dam06 module 2 Ext01 module 3)
59. The student will be able to protect computers and other electronic control modules during welding procedures. (HP-I) (2.E.10)(WCS01 module 1)

*The student will be able to apply safety standards for the collision repair industry*  
**(Linked External Standards 4.A Safety Precautions)**

60. The student will be able to 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 module 3)
61. The student will be able to inspect spray environment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards. (HP-I)(4.A.3)(EDS02 module 1 REF01 module 3 WKR01 module 2)
62. The student will be able to select and use the NIOSH approved personal sanding respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation. (HP-I)(4.A.4)(WKR01 module 4)
63. The student will be able to select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye and ear protection,

etc.). (HP-I) (4.A.6)(EDS02 modules 1,2,3,4,5,6,7 REF02 module 2 REF03 modules 2,4 WKR01 module 4)

*The student will be able to use cutting procedures in non-structural damage repair*  
**(Linked External Standards 2.E Metal Welding and Cutting)**

64. The student will be able to 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)
65. The student will be able to weld and cut aluminum. (HP-G)(2.E.3)(WCS01 modules 1,2)
66. The student will be able to protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations. (HP-I) (2.E.9)EXT02 modules 1,2,3,4,5 WCS01 module 1)
67. The student will be able to protect computers and other electronic control modules during welding procedures. (HP-I) (2.E.10)(WCS01 module 1)
68. The student will be able to identify cutting process for different materials and locations perform cutting operation. (HP-I) (2.E.18)(WCS05 module 4)

*The student will be able to determine procedures necessary for working with plastics and adhesives*

**(Linked External Standards 2.F Plastics and Adhesives)**

69. The student will be able to identify the types of plastics; determine repair ability. (HP-I)(2.F.1)(DAM02 module 2 PLA01 modules 1,3 PLA02 modules 1,4)
70. The student will be able to 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)
71. The student will be able to replace or repair rigid, semi-rigid, and flexible plastic panels. (HP-G)(2.F.3)(EXT01 module 1,2,3,4,5,6 EXT02 modules 2,3,4 PLA01 module 2 PLA02 modules 2,3)
72. The student will be able to remove or repair damaged areas from rigid exterior composite panels. (HP-G)(2.F.4)(EXT02 module 2 PLA02 module 3)
73. The student will be able to replace bonded rigid exterior composite body panels; straighten or align panel supports. (HP-G)(2.F.5)(EXT02 module 2)

#### **ASSESSMENT OF LEARNER OUTCOMES:**

Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

**Attendance:** Attendance will be in accordance with the certifying agency's requirements.

#### **SPECIAL NOTES:**

**Safety:** Attendance is critical throughout the safety instructions and quizzes. Students must complete all of the safety training before the student can advance or go on to the next course.

Caveats:

1. Safety glasses with side shields are required to be worn during lab activities for this course. This is in compliance with accepted eye protection practices and Kansas State Law (K.S.A. 72-5207). Safety glasses must meet American National Standards Institute Z87.1 specifications. (NOTE: Most prescription eyewear does not meet ANSI Z87.1. Students who wear prescription glasses must: a) Provide evidence that existing eyewear meets ANSI Z87.1, or b) Wear cover goggles (if allowable), or c) Purchase and wear ANSI Z87.1 prescription eyewear.
2. Lab Guidelines: In order to assist with the safe and efficient operation of the automotive lab area, students are expected to be familiar with and adhere to the Automotive Student Lab Guidelines.

This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student's progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college's policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact, the Director of the Academic Resource Center, in Rm. 3354 or call at 913-288-7670 V/TDD.

All enrolled students at Kansas City Kansas Community College are subject to follow all rules, conditions, policies and procedures as described in both the Student Code of Conduct as well as the Student Handbook. All Students are expected to review both of these documents and to understand their responsibilities with regard to academic conduct and policies. The Student Code of Conduct and the Student Handbook can be found on the KCKCC website.



