

# Dakota County Technical College

## ABCT 2108: Unibody/Frame/Wheel Alignment I

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 1

Lab Hours/Week: 3

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course will focus on unibody, full frame repair and alignment using various alignment, measuring and pulling equipment. This course will also contain wheel alignment procedures and terminology relating to collision damaged vehicles.

Prerequisites: ABCT1111, ABCT1212 or BSEP1301, and ABCT1120.

**B. COURSE EFFECTIVE DATES:** 08/19/2002 - Present

**C. OUTLINE OF MAJOR CONTENT AREAS**

**D. LEARNING OUTCOMES (General)**

1. Perform safe frame repair practices
2. Identify proper frame welding procedures
3. Identify history of automotive frame/unibody development
4. Identify frame types
5. Identify frame dimension specification manual usage
6. Identify frame damage analysis
7. Identify frame repair equipment maintenance
8. Identify frame repair setup procedures
9. Identify frame repair types of pulling equipment
10. Identify frame repair hookups
11. Identify various frame anchoring methods
12. Identify frame repair measuring equipment
13. Identify safe repair practices
14. Identify proper frame heating procedures
15. Identify proper frame rail sectioning
16. Identify final frame repair inspection procedures
17. Perform frame dimension specification manual usage
18. Perform frame damage analysis
19. Perform frame repair equipment maintenance
20. Perform frame repair setup
21. Perform frame hookups
22. Utilize frame anchoring equipment
23. Utilize frame repair measuring equipment
24. Demonstrate parts removal procedures
25. Demonstrate proper frame heating procedure
26. Demonstrate proper frame welding procedures
27. Demonstrate proper frame rail sectioning
28. Perform final frame repair inspection procedures
29. Identify parts removal procedures
30. Diagnose and measure structural damage using tram and self-centering gauges according to industry specifications HP-I
31. Attach frame anchoring devices HP-I
32. Straighten and align mash (collapse) damage HP-G
33. Straighten and align sag damage HP-G
34. Straighten and align sideway damage HP-G
35. Straighten and align twist damage HP-G
36. Straighten and align diamond frame damage HP-G
37. Remove and replace damage frame horns, side rails, and cross members according to manufacturer's specifications/procedures HP-G
38. Restore corrosion protection to repaired or replaced frame areas HP-G
39. Repair or replace weakened or cracked frame members in accordance with vehicle manufacturer's specifications/procedures HP-G
40. Identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems; align or replace in accordance with vehicle manufacturer's specifications/procedures HP-G
41. Identify heat limitations in frame repair HP-G

41. Identify heat limitations in frame repair HP-G
42. Identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and 4-wheel alignment problems; realign or replace in accordance with vehicle manufacturer's specifications/procedures HP-G
43. Diagnose and analyze unibody vehicle dimensions using a tram gauge HP-I
44. Determine and inspect the locations of all suspension, steering, and powertrain component attaching points on the body HP-G
45. Diagnose and measure unibody vehicles using a dedicated (fixture) measuring system HP-G
46. Diagnose and measure unibody vehicles using a universal measuring system (mechanical, electronic, laser) HP-G
47. Determine the extent of the direct and indirect damage and the direction of impact; plan the methods and sequence of repair HP-I
48. Attach body anchoring devices; remove or reposition components as necessary HP-I
49. Straighten and align cowl assembly HP-G
50. Straighten and align roof rails/headers and roof panels HP-G
51. Straighten and align hinge and lock pillars HP-G
52. Straighten and align body openings, floor pans, and rocker panels HP-G
53. Straighten and align quarter panels, wheelhouse assemblies, and rear body sections (including rails and suspension/powertrain mounting points) HP-G
54. Straighten and align front-end sections (aprons, strut towers, upper and lower rails, steering, and suspension/power train mounting points, etc.) HP-G
55. Use proper heat stress relief methods in high strength steel in accordance with manufacturer specifications/procedures HP-G
56. Use proper cold stress relief methods HP-G
57. Remove creases and dents using power tools and hand tools to restore damaged areas to proper contours and dimensions HP-I
58. Determine the extent of damage to structural steel body panels; repair or replace HP-I
59. Remove and replace damaged sections of structural steel body panels in accordance with manufacturer's specifications/procedures HP-G
60. Restore corrosion protection to repaired or replaced unibody structural areas HP-G
61. Exhibit shop professionalism
62. Demonstrate an understanding of structural foam applications. HP-G
63. Analyze and identify crush/collapse zones. HP-I
64. Restore mounting and anchoring locations. HP-G

#### **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

None

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

#### **G. SPECIAL INFORMATION**

None noted