

**Department:**

Automotive Collision and Refinishing Technology

**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, setup 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.

**Course Competencies:**

The learning outcomes and competencies detailed in this syllabus meet or exceed the learning outcomes and competencies specified by the Postsecondary Technical Education Authority (TEA) for this course as approved by the Kansas Board of Regents.

Upon completion of the course, the student should be able to:

1. Explore the components of safety pertaining to auto collision and repair
  - a. Identify safety standards for the collision repair industry
  - b. Identify safety equipment
  - c. Identify hazardous materials related to the collision repair industry
  - d. Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations. (HP-I)
  - e. Identify safety and personal health hazards according to OSHA guidelines(HP-I)
2. Explore the parts and construction of vehicles
3. Explore opportunities in the auto collision industry
4. Identify metal straightening techniques
  - a. Determine the extent of direct and indirect damage and direction of impact; develop and document a repair plan. HP-I
  - b. Determine the extent of damage to aluminum body panels; repair or replace. HP-G
  - c. Remove paint from the damaged area of a body panel. HP-I
  - d. Locate and reduce surface irregularities on a damaged body panel. HP-I
  - e. Demonstrate hammer and dolly techniques. HP-I
  - f. Determine the proper metal finishing techniques for aluminum. HP-G
5. Identify the application and use of body fillers
  - a. Remove paint from the damaged area of a body panel. HP-I

- b. Locate and reduce surface irregularities on a damaged body panel. HP-I
  - c. Demonstrate hammer and dolly techniques. HP-I
  - d. Mix body filler. HP-I
  - e. Apply body filler; shape during curing. HP-I
  - f. Rough sand cured body filler to contour; finish sand. HP-I
6. Demonstrate proper use, set-up and storage of welding equipment
- a. Determine the correct GMAW (Mig) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation. HP-I
  - b. 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
  - c. Store, handle, and install high-pressure gas cylinders. HP-I
  - d. Determine work clamp (ground) location and attach. HP-I
  - e. Identify different methods of attaching non-structural components (squeeze type resistant spot welds (STRSW), riveting, non-structural adhesive, silicon bronze, etc.) HP-G
7. Distinguish between weldable and non-weldable materials
- a. Identify weldable and non-weldable materials used in collision repair. HP
8. Demonstrate fundamental industry standard recommended welds
- a. Weld and cut high-strength steel and other steels. HP-I
  - b. Determine the correct GMAW (Mig) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation. HP-I
  - c. 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
  - d. Store, handle, and install high-pressure gas cylinders. HP-I
  - e. Determine work clamp (ground) location and attach. HP-I
  - f. 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
  - g. Clean and prepare the metal to be welded, assure good metal fit-up, apply weldthrough primer if necessary, and clamp as required. HP-I
  - h. Determine the joint type (butt weld with backing, lap, etc.) for weld being made. HPI
  - i. Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation. HP-I
  - j. Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and fillet. HP-I
  - k. Identify the causes of various welding defects; make necessary adjustments. HP-I
  - l. Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments. HP-I
9. Identify plastics and adhesives used in automotive industry
- a. Identify the types of plastics; determine reparability. HP-I
  - b. Identify the types of plastic repair procedures; clean and prepare the surface of plastic parts. HP-I
10. Explain the general purpose of damage, estimation and repair orders
- a. Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan. HP-I
11. Explore the processes required for outer body panel repairs, replacements and adjustments

- a. Determine the extent of direct and indirect damage and direction of impact; develop and document a repair plan. HP-I
  - b. Inspect, remove and replace bolted, bonded, and welded steel panel or panel assemblies. HP-I
  - c. Determine the extent of damage to aluminum body panels; repair or replace. HP-G
  - d. Inspect, remove, replace, and align hood, hood hinges, and hood latch. HP-I
  - e. Inspect, remove, replace, and align deck lid, lid hinges, and lid latch. HP-I
  - f. Inspect, remove, replace, and align doors, tailgates, hatches, lift gates, latches, hinges, and related hardware. HP-I
  - g. Inspect, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware. HP-I
  - h. Inspect, remove, replace and align front fenders, headers, and other panels. HP-I
12. Demonstrate fundamental cutting procedures
- a. Weld and cut high-strength steel and other steels. HP-I
  - b. Weld and cut aluminum. HP-G
  - c. Store, handle, and install high-pressure gas cylinders. HP-I
  - d. Identify cutting process for different materials and locations perform cutting operation. HP-I

## Course Content:

- A. Safety components
- B. Parts and Construction of Vehicles
- C. Opportunities in Auto Collision Industry
- D. Metal Straightening
- E. Application and Use of Body Fillers
- F. Welding Equipment Use, Set-up, and Storage
- G. Weldable and Non-weldable Materials
- H. Standard Recommended Welds
- I. Plastics and Adhesives
- J. Damage Estimation and Order Repairs
- K. Outer Door Panel Repair, Replacements, and Adjustments
- L. Cutting Procedure

## Learning Assessments:

Assessments may include quizzes, tests, project work, demonstrated competence, instructor observation, weekly assignments and/or written papers.

## Instructional Materials:

*Textbook: Duffy, J.E. (2015). Auto Body Repair Technology. (6<sup>th</sup> ed.). Boston, MA: Cengage Learning. ISBN: 9781133702856.*

*Textbook: Duffy, J.E. (2015). Tech Manual for Duffy's Auto Body Repair Technology. (6<sup>th</sup> ed.). Boston, MA: Cengage Learning. SBN: 9781133702863.*

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the “Disabilities Self-Identification Form” on our [Disability Services website](#).

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

#### **A Note on Harassment, Discrimination and Sexual Misconduct**

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an [online report](#) about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our [Equity Grievance Policy](#).