TN Department of Education | College, Career and Technical Education

May 2023

Collision Repair: Damage Analysis, Estimating, and Customer Service

Primary Career Cluster:	Transportation
Course Contact:	CTE.Standards@tn.gov
Course Code(s):	C20H19
Prerequisite(s):	*Collision Repair: Non-Sructural* (C20H13) and/or *Collision Repair: Painting & Refinishing* (C20H14)
Credit:	1
Grade Level:	12
Elective Focus - Graduation Requirements:	This course satisfies one of three credits required for an elective focus when taken in conjunction with other Transportation courses.
POS Concentrator:	This course satisfies one out of two required courses that meet the Perkins V concentrator definition, when taken in sequence in the approved program of study.
Programs of Study and Sequence:	This course is the fourth and final course in the *Automotive Collision Repair* program of study.
Aligned Student Organization(s):	SkillsUSA: http://www.skillsusatn.org/
Coordinating Work-Based Learning:	Teachers who hold an active WBL certificate may offer placement for credit when the requirements of the state board's WBL Framework and the Department's WBL Policy Guide are met. For information, visit https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html.
Promoted Tennessee Student Industry Credentials:	Credentials are aligned with postsecondary and employment opportunities and with the competencies and skills that students acquire through their selected program of study. For a listing of promoted student industry credentials, visit https://www.tn.gov/education/educators/career-and-technical-education/student-industry-certification.html.
Teacher Endorsement(s):	507, 771
Additional Required Teacher Certifications/Training:	ASE B-3 Industry Certification
Teacher Resources:	https://www.tn.gov/education/educators/career-and-technical-education/career-clusters/cte-cluster-transportation-distribution-logistics.html Best for All Central: https://bestforall.tnedu.gov/

Course at a Glance

CTE courses provide students with an opportunity to develop specific academic, technical, and 21st century skills necessary to be successful in career and in life. In pursuit of ensuring every student in Tennessee achieves this level of success, we begin with rigorous course standards which feed into intentionally designed programs of study.

Students engage in industry relevant content through general education integration and experiences such as career & technical student organizations (CTSO) and work-based learning (WBL). Through these experiences, students are immersed with industry standard content and technology, solve industry-based problems, meaningfully interact with industry professionals and use/produce industry specific, informational texts.

Using a Career and Technical Student Organization (CTSO) in Your Classroom

CTSOs are a great resource to put classroom learning into real-life experiences for your students through classroom, regional, state, and national competitions, and leadership opportunities. Below are CTSO connections for this course, note this is not an exhaustive list.

- Participate in CTSO Fall Leadership Conference to engage with peers by demonstrating logical thought processes and developing industry specific skills that involve teamwork and project management.
- Participate in contests that highlight job skill demonstration. These include Career Pathways Showcase, Job Interview, Collision Damage Appraisal, Collision Repair Technology, and Automotive Refinishing Technology.

Using a Work-Based Learning (WBL) in Your Classroom

Sustained and coordinated activities that relate to the course content are the key to successful work-based learning. Possible activities for this course include the following. This is not an exhaustive list.

- **Standard 2.1** | Include a safety briefing in a visit to an industry partner/job site.
- **Standards 3.1-3.2 |** Visit a local company and participate in the damage analysis done by a technician in the shop.
- **Standards 4.1 and 5.1** | Have the students do a project that is supervised or evaluated by a manager at a local company.
- **Standards 7.1-7.3** | Participate in the internship.

Course Description

Collision Repair: Damage Analysis, Estimating, and Customer Service is the capstone course in the *Automotive Collision Repair* program of study. It is intended to prepare students for careers in the automotive repair industry. Upon completion of this course, a proficient student proficient will be able to assess collision damage, estimate repair costs, and work with vehicle owners in a professional setting. Utilizing problem-solving strategies and resources developed in this course, including original equipment manufacturer (OEM) manuals, electronic data, and photo analysis of damaged vehicles, students will be prepared to generate work orders in a variety of collision damage situations. Students completing the *Automotive Collision Repair* program of study will be eligible to take the examination for Automotive Student Excellence (ASE) Student Certification in Collision. Some tasks are assigned a "High Priority (HP)" designation. Accredited programs must include at least 95% of the HP-I (Individual) tasks and 90% of the HP-G (Group) tasks in the curriculum.

Course Requirements

This capstone course aligns with the requirements of the Work-Based Learning Framework (established in Tennessee State Board High School Policy), with the Tennessee Department of Education's Work-Based Learning Policy Guide, and with state and federal Child Labor Law.

Course Standards

1. Personalized Learning Plan

1.1 Personalized Learning Plan: A student will have a Personalized Learning Plan that identifies their **long-term goals**, demonstrates how the **Work-Based Learning (WBL) experience aligns with their elective focus** and/or high school plan of study, addresses how the student plans to **meet and demonstrate the course standards**, and addresses **employability skill attainment** in the following areas:

a. application of academic and technical knowledge and skills (embedded in course standards),
b. career knowledge and navigation skills,
c. 21st century learning and innovation skills, and
d. personal and social skills.

2. Safety

2.1 Safety: Comply with **personal and environmental safety practices** associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

a. Use and inspect **personal protective equipment** every time equipment is used.
b. Inspect, maintain, and employ **safe operating procedures** with tools and equipment, such as hand and power tools, ladders, scaffolding, and lifting equipment.
c. Assume responsibilities under **HazCom (Hazard Communication) regulations.**

d. Adhere to responsibilities, regulations, and Occupational Safety & Health Administration (OSHA) policies regarding reporting of accidents and observed hazards, and regarding emergency response procedures.
e. Maintain a record of written safety examinations and equipment examinations that the student has passed.
f. Utilize **SDSs (safety data sheets)** and identify the health hazards associated with hazardous material.

3. Damage Analysis

3.1 Analyze Vehicle: Gather information from a variety of print and digital sources (such as OEM manuals and online instructional materials) as well as firsthand experiences observing a qualified technician **prepare a vehicle for damage analysis**. Choose the **steps in the entire process of analyzing damage and estimating costs**. Describe how key steps are accomplished, that is, what the technician should do and observe at each step. Steps include but are not limited to the following. (Note: items marked HP-I should be demonstrated by the student.)

a. Position the vehicle for inspection. HP-G
b. Prepare vehicle for inspection by providing access to damaged areas. HP-G
c. **Analyze damage** to determine appropriate methods for overall repairs. HP-I
d. Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage. HP-G
e. **Gather details** of the incident/accident necessary to determine the full extent of vehicle damage. HP-G
f. Identify and record pre-existing damage. HP-I
g. Identify and record prior repairs. HP-G

3.2 Conduct Inspection: Accurately complete a **summary of damages on a claim form**, citing specific evidence to support the need for components, parts, and labor necessary to repair the vehicle. Formulate a **list of needed parts** necessary to repair the vehicle to OEM standards. Identify suspension, electrical, and mechanical elements as well as interior damage.

a. Perform visual inspection of structural components and members. HP-G
b. Identify structural damage using measuring tools and equipment. HP-I
c. Perform visual inspection of non-structural components and members. HP-I
d. Determine parts, components, material type(s) and procedures necessary for a proper repair. HP-I
e. Identify type and condition of finish; determine if refinishing is required. HP-I
f. Identify suspension, electrical, and mechanical component physical damage. HP-G
g. Identify safety systems physical damage. HP-G
h. Identify interior component damage. HP-I
i. Identify damage to add-on accessories and modifications. HP-G
j. Identify single (one time) use components. HP-G

4. Damage Estimating

4.1 Gather Information: **Compile evidence** from the vehicle and owner/operator, including pictures and written summaries, to ascertain damage, determine make and model, and identify VIN information necessary to determine appropriate OEM parts.

a. Determine and record **customer/vehicle owner information**. HP-I
b. Identify and record **vehicle identification number (VIN) information**, including nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant. HP-I
c. Identify and record vehicle options, including trim level, paint code, transmission, accessories, and modifications. HP-I
d. Identify safety systems; determine replacement items. HP-G
e. Apply appropriate estimating and parts nomenclature (terminology). HP-I
f. Determine and apply appropriate estimating sequence. HP-I
g. Utilize estimating guide procedure pages. HP-I

4.2 Select Repairs: Determine whether **parts** will be aftermarket, recyclable, rebuilt, or reconditioned. Develop a cost analysis of **parts and labor** value for each operation required. Assess the extent of **direct and indirect damage** and direction of impact. Develop a **repair plan** that includes summary of damage, recommended repairs, costs of parts and labor, and necessary finishing.

a. Apply estimating guide footnotes and headnotes as needed. HP-I
b. Estimate labor value for operations requiring judgment. HP-G
c. Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish). HP-I
d. Select and price OEM parts; verify availability, compatibility, and condition. HP-G
e. Select and price alternative/optional OEM parts; verify availability, compatibility and condition. HP-G
f. Select and price aftermarket parts; verify availability, compatibility, and condition. HP-G
g. Select and price recyclable/used parts; verify availability, compatibility and condition. HP-G
h. Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition. HP-G
i. Determine price and source of necessary sublet operations. HP-G
j. Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items. HP-G

4.3 Estimate: Prepare written work orders for documentation of a collision repair service. Synthesize information about the number and **cost of parts**, and detail the extent of the **services involved**. Apply quantitative math skills to develop an **accurate cost analysis**; then compile the work order.

a. Recognize and apply overlap deductions, included operations, and additions. HP-I
b. Determine additional material and charges. HP-G
c. Determine refinishing material and charges. HP-I
d. Apply math skills to establish charges and totals. HP-I
e. Interpret computer-assisted and manually written estimates; verify the information is current. HP-I

f. Identify procedural differences between computer-assisted systems and manually written estimates. HP-G
g. Identify procedures to restore corrosion protection; establish labor values and material charges. HP-G
h. Determine the cost effectiveness of the repair and determine the approximate vehicle retail and repair value. HP-G
i. Recognize the differences in estimation procedures when using different information provider systems. HP-G
j. Verify accuracy of estimate compared to the actual repair and replacement operations. HP-G

5. Vehicle Construction and Parts Identification

5.1 Vehicle Construction and Parts Identification: Determine **cost of components and accessories** for various makes and models of vehicles. Write **explanatory narratives** that examine and define the various components, establish the **repairability** of those components, and integrate the information accurately into the work order.

a. Identify type of vehicle construction (space frame, unibody, body-over-frame). HP-G
b. Recognize the different damage characteristics of space frame, unibody, and body-over-frame vehicles. HP-G
c. Identify impact energy absorbing components. HP-G
d. Identify steel types; determine repairability. HP-G
e. Identify aluminum/magnesium components; determine repairability. HP-G
f. Identify plastic/composite components; determine repairability. HP-G
g. Identify vehicle glass components and repair/replacement procedures. HP-G
h. Identify add-on accessories. HP-G

6. Customer Relations and Sales Skills

6.1 Customer Relations: **Interact respectfully** with individuals involved in various aspects of customer service, including OEM representatives, customers/clients, insurance representatives, and suppliers. **Resolve conflicts** and differences to maintain a smooth workflow. Research negotiation skills in order to apply them to workplace situations.

a. Acknowledge and/or **greet customer/client**. HP-I
b. **Listen to customer/client**; collect information and identify customer's/client's concerns, needs, and expectations. HP-I
c. Establish cooperative attitude with customer/client. HP-I
d. **Identify yourself** to customer/client; offer assistance. HP-I
e. **Deal with angry customer/client**. HP-I
f. Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process. HP-G
g. Recognize basic claims handling procedures; explain to customer/client. HP-G
h. Project positive attitude and professional appearance. HP-I
i. Provide and review warranty information. HP-I
j. Provide and review technical and consumer protection information. HP-G
k. Estimate and explain duration of out-of-service time. HP-G
l. Apply negotiation skills to obtain a mutual agreement. HP-G
m. Interpret and explain manual or computer-assisted estimate to customer/client. HP-I

7. Hands-On Experience**

Option I: Internship

7.1 Internship: Participate in a **work-based learning internship** at a licensed collision repair business to develop, practice, and demonstrate skills outlined in standards above. Internship should follow current Tennessee work-based learning guidelines and/or AYES internship guidelines as appropriate.

7.2 Journal: Create and continually update a personal **journal to document internship activities**. Draw connections between the experience and course content, thoughtfully reflecting on:

a. acquired leadership skills,
b. problem-solving techniques and decision-making skills,
c. team member participation in a learning environment,
d. personal career development, and
e. opportunities for industry certifications.

7.3 Assess Internship: Analyze and assess the success and failures of activities during the internship. **Summarize the internship experience** and next steps for personal and professional growth.

Option II: Portfolio

7.4 Portfolio: **Create a portfolio**, or similar collection of work, offering evidence to illustrate mastery of skills and knowledge as outlined in the standards above. The portfolio should reflect thoughtful assessment and evaluation of the student's progression of work involving the estimation of damage to a vehicle and adherence to Safety Data Sheets (SDS). The following documents will reside in the student's electronic career portfolio:

a. personal code of professional ethics;
b. career and professional growth plan;
c. list of responsibilities undertaken throughout the course;
d. examples of visual materials developed and used during the course (such as graphics, presentation slides, videos, demonstrations);
e. description of technology used, with examples if appropriate;
f. periodic journal entries reflecting on tasks and activities; and
g. feedback from instructor based on observations.

**Although a hands-on experience in work-based learning (WBL) is the most ideal, it is recognized that not all students will be able to be placed in a working collision establishment. While the WBL experience is encouraged, the portfolio option can be used in place of, or to supplement, an internship experience.

Standards Alignment Notes

*References to other standards include:

- Automotive Service Excellence (ASE) Education Foundation standards for Collision Repair and Refinish.
- P21: Partnership for 21st Century Skills Framework for 21st Century Learning

- Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.