



9030

FUNDAMENTALS OF COLLISION
REPAIR AND REFINISHING
TECHNOLOGY (11A)

30S/30E/30M

A Collision Repair and Refinishing Technology Course

9030: FUNDAMENTALS OF COLLISION REPAIR AND REFINISHING TECHNOLOGY (11A) 30S/30E/30M

Course Description

In this course, students will learn about vehicle construction, and the use of materials, fasteners, and adhesives. They will apply measuring and estimating skills to restore vehicles to original manufacturer's specifications. They will select materials, tools, and equipment for surface preparation, clean and sand vehicles, apply masking materials, operate and maintain paint spray guns, and demonstrate paint shop health and safety practices.

Goal 1: Describe and apply appropriate **health and safety** practices.

GLO 1.1: Describe and apply appropriate **health and safety** practices.

- SLO 11A.1.1.1: Identify safety and health requirements. (A2.1)
- SLO 11A.1.1.2: Identify personal protective equipment (PPE) and procedures and describe the importance of using them. (A2.2) (TSA 16)
- SLO 11A.1.1.3: Identify electrical safety and outline the safety principles for working on and around electrical equipment. (A2.3) (TSA 18)
- SLO 11A.1.1.4: Identify fire safety practices and outline workplace fire safety principles. (A2.4) (TSA 19)
- SLO 11A.1.1.5: Recognize and control hazards. (A2.6)
- SLO 11A.1.1.6: Identify the hazards in confined spaces and the preparation needed to work in a confined space. (A2.7) (TSA 20)
- SLO 11A.1.1.7: Identify First Aid/CPR. (A2.8)
- SLO 11A.1.1.8: Explain the Workplace Hazardous Material Information System (WHMIS) and identify the WHMIS safety requirements. (A2.9) (TSA 13)
- SLO 11A.1.1.9: Identify and control hazards. (A2.10)
- SLO 11A.1.1.10: Identify safety precautions related to gas metal arc welding. (C2.2)
- SLO 11A.1.1.11: Identify and describe safety considerations and procedures related to fasteners and adhesives. (D2.1)
- SLO 11A.1.1.12: Practise safety precautions related to batteries. (B2.8)

- SLO 11A.1.1.13: Identify safety considerations when working with body fillers and abrasives. (F2.4)
- SLO 11A.1.1.14: Create and maintain a safe and organized working environment.
- SLO 11A.1.1.15: Follow guidelines listed in the Safe Work Procedure for specific tasks.
- SLO 11A.1.1.16: Describe the safety considerations of products used in vehicle detailing. (H2.3)
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GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Manual*.

No applicable SLOs.

Goal 2: Select, use, and manage **tools and equipment**.

GLO 2.1: Select and manage **tools and equipment**.

- SLO 11A.2.1.1: Identify, describe, and demonstrate care and maintenance procedures related to tools and equipment. (A4.10, A4.17).
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GLO 2.2: Use **tools and equipment**.

- SLO 11A.2.2.1: Identify types of specialized measuring equipment, and describe their applications. (A4.3)
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Goal 3: Demonstrate vehicle **damage analysis** and **repair estimation**.

GLO 3.1: Demonstrate vehicle **damage analysis**.

- SLO 11A.3.1.1: Identify damage on vehicle surfaces.
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GLO 3.2: Demonstrate vehicle **repair estimation**.

- SLO 11A.3.2.1: Discuss the purpose and importance of repair estimates and work orders.
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Goal 4: Demonstrate **welding** procedures.

GLO 4.1: Demonstrate **welding** procedures.

No applicable SLOs.

Goal 5: Demonstrate **structural repair**.

GLO 5.1: Demonstrate an understanding of **vehicle construction**.

SLO 11A.5.1.1: Identify types of vehicle construction, and describe their characteristics. (D1.1)

SLO 11A.5.1.2: Identify body sections, and describe their components. (D1.2)

SLO 11A.5.1.3: Identify and describe structural and non-structural components. (D1.3)

SLO 11A.5.1.4: Identify and describe the types of materials used in vehicle construction. (D1.4)

SLO 11A.5.1.5: Demonstrate sheet metal panel adjustments. (D1.5)

GLO 5.2: Demonstrate **measuring and gauging**.

SLO 11A.5.2.1: Use body and frame damage measurement equipment.

GLO 5.3: Perform **structural repairs**.

SLO 11A.5.3.1: Discuss the importance of vehicle structures being dimensionally correct.

Goal 6: Demonstrate **sheet metal repair**.

GLO 6.1: Demonstrate an understanding of the **properties** of metal.

SLO 11A.6.1.1: Identify the types of automotive sheet metal. (F1.1)

SLO 11A.6.1.2: Define and explain terms associated with metallurgy. (B2.1)

GLO 6.2: Repair sheet metal.

- SLO 11A.6.2.1: Identify and describe types of damage to sheet metal. (F1.2)
- SLO 11A.6.2.2: Identify the types of panels and their associated repair procedures. (F1.4)
- SLO 11A.6.2.3: Describe the methods used to detect surface irregularities. (F1.6)
- SLO 11A.6.2.4: Describe the procedures used to rough out and align damaged sheet metal. (F1.7)
- SLO 11A.6.2.5: Describe the procedures used to prepare sheet metal for application of fillers. (F1.8)
- SLO 11A.6.2.6: Describe the procedure for correcting rust perforation. (F1.9)
- SLO 11A.6.2.7: Determine primary and secondary damage. (F1.11)
- SLO 11A.6.2.8: Perform fabrication for rust repair patches. (F1.12)

Goal 7: Select, use, and manage seam sealers, fillers, and adhesives.

GLO 7.1: Select, use, and manage seam sealers and adhesives.

- SLO 11A.71.1: Identify types of adhesives and describe their applications. (D2.4)
- SLO 11A.71.2: Identify considerations when applying and removing adhesives. (D2.5)
- SLO 11A.71.3: Demonstrate removal of adhesives. (D2.6)

GLO 7.2: Select, use, and manage fillers.

- SLO 11A.72.1: Identify the types of body fillers, and describe their characteristics and applications. (F2.3)
- SLO 11A.72.2: Describe the techniques and procedures used to apply body fillers. (F2.5)
- SLO 11A.72.3: Describe the procedures and techniques for shaping and finishing body fillers. (F2.6)
- SLO 11A.72.4: Demonstrate proper surface preparations for application of body fillers. (F2.7)
- SLO 11A.72.5: Demonstrate mixing and applying fillers. (F2.8)
- SLO 11A.72.6: Demonstrate procedures and methods for detecting high and low spots. (F2.9)
- SLO 11A.72.7: Demonstrate the procedures and techniques for shaping and finishing fillers. (F2.10)
- SLO 11A.72.8: Perform procedures used to detect surface irregularities. (F2.11)

Goal 8: Select, use, and manage **fasteners**.

GLO 8.1: Select, use, and manage **fasteners**.

- SLO 11A.8.1.1: Identify types of fasteners, and describe their applications. (D2.2)
- SLO 11A.8.1.2: Describe the procedures to remove and install fasteners. (D2.3)
- SLO 11A.8.1.3: Demonstrate removal of mechanical fasteners. (D2.6)

Goal 9: Demonstrate **glass repair and replacement**.

GLO 9.1: Demonstrate **glass repair and replacement**.

- SLO 11A.9.1.1: Discuss glass repair and replacement.

Goal 10: Demonstrate repair and replacement of **upholstery, trim, and hardware**.

GLO 10.1: Repair and replace **upholstery**.

- SLO 11A.10.1.1: Demonstrate an awareness of the need to repair and replace upholstery.

GLO 10.2: Repair and replace **trim and hardware**.

- SLO 11A.10.2.1: Describe the procedures used to repair or replace exterior trim. (H3.4)
- SLO 11A.10.2.2: Repair and replace exterior trim. (H3.10)

Goal 11: Demonstrate **surface preparation**.

GLO 11.1: Select, use, and manage **materials other than abrasives** used in surface preparation.

- SLO 11A.11.1.1: Identify products used to clean surfaces, their applications, and the procedures for use. (H1.2)
 - SLO 11A.11.1.2: Identify substrate types, and describe the procedures and considerations for evaluating their condition. (H1.3)
 - SLO 11A.11.1.3: Describe and demonstrate surface preparation of substrates. (H1.6)
 - SLO 11A.11.1.4: Describe and demonstrate masking and unmasking techniques. (H1.7).
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GLO 11.2: Select, use, and manage **abrasives** used in surface preparation.

SLO 11A.11.2.1: Identify the types of abrasives, and describe their characteristics and applications. (F2.1)

SLO 11A.11.2.2: Describe the procedures and techniques for using abrasives. (F2.2)

GLO 11.3: Prepare substrates.

SLO 11A.11.3.1: Describe ideal working conditions for surface preparation. (H1.1)

SLO 11A.11.3.2: Identify topcoats and undercoats, and describe the procedures and considerations for evaluating their condition. (H1.4)

SLO 11A.11.3.3: Identify and describe the methods involved in stripping topcoats, undercoats, and paint. (H1.5)

Goal 12: Demonstrate refinishing.

GLO 12.1: Demonstrate **refinishing** processes.

SLO 11A.12.1.1: Demonstrate the ability to apply primers. (H1.8)

SLO 11A.12.1.2: Demonstrate the ability to use proper spray gun technique and to maintain equipment. (H1.9)

Goal 13: Demonstrate cleaning and detailing.

GLO 13.1: Demonstrate **cleaning and detailing**.

SLO 11A.13.1.1: Identify equipment used in detailing vehicle exterior. (H2.1)

SLO 11A.13.1.2: Identify equipment used in detailing vehicle interior. (H2.2)

SLO 11A.13.1.3: Describe techniques for correcting topcoat defects. (H2.4)

SLO 11A.13.1.4: Describe the procedures used to remove overspray. (H2.5)

SLO 11A.13.1.5: Describe the procedures used to polish vehicle exterior. (H2.6)

SLO 11A.13.1.6: Describe the procedures used to clean vehicle interior. (H2.7)

SLO 11A.13.1.7: Describe the procedures used to wash vehicle exterior. (H2.8)

Goal 14: Describe **vehicle systems**.**GLO 14.1:** Describe **vehicle systems**.

- SLO 11A.14.1.1: Describe the procedures used to test batteries. (B2.9)
- SLO 11A.14.1.2: Describe the procedures used to charge batteries. (B2.10)
- SLO 11A.14.1.3: Describe the procedures used to remove and replace batteries. (B2.11)
- SLO 11A.14.1.4: Remove and reinstall batteries while maintaining memory. (B2.12)
- SLO 11A.14.1.5: Load test an automotive battery. (B2.13)
- SLO 11A.14.1.6: Charge an automotive battery. (B2.14)
- SLO 11A.14.1.7: Disconnect and reconnect batteries. (B2.15)
- SLO 11A.14.1.8: Demonstrate boosting requirements. (B2.16)
- SLO 11A.14.1.9: Describe different types of passenger restraint systems.

Goal 15: Describe and demonstrate transferable **cross-curricular** knowledge and skills.**GLO 15.1:** **Read, interpret, and communicate** information.

- SLO 11A.15.1.1: Read, interpret, and communicate terminology and acronyms related to collision repair and refinishing.
- SLO 11A.15.1.2: Retrieve vehicle identification number and all other necessary information as specified by the instructor for a specific job. (A5.7)
- SLO 11A.15.1.3: Read and interpret repair estimates in order to perform practical repairs on vehicles.

GLO 15.2: Apply knowledge and skills from **mathematics**.

- SLO 11A.15.2.1: Demonstrate trade-related calculations as specified by instructor. (B2.4)
- SLO 11A.15.2.2: Perform basic algebra. (B1.7)
- SLO 11A.15.2.3: Demonstrate proficiency in calculating volume.

GLO 15.3: Apply knowledge and skills from **information and communication technology**.

- SLO 11A.15.3.1: Retrieve trade-related documents from the computer. (A5.8)

GLO 15.4: Apply knowledge and skills from the **sciences**.

No applicable SLOs.

Goal 16: Understand **career opportunities** and the **working environment**.

GLO 16.1: Describe **education, career opportunities, professional organizations, and working environments** related to collision repair and refinishing technology and associated fields.

SLO 11A.16.1.1: Describe special opportunities and challenges regarding training. (A1.3)

Goal 17: Demonstrate an awareness of **sustainability**.

GLO 17.1: Describe the effects of collision repair and refinishing technology on **human health and well-being**, including on tradespersons working in the field and those who use their services.

SLO 11A.17.1.1: Demonstrate the use of dust collection systems.

SLO 11A.17.1.2: Discuss the long-term health effects related to exposure to airborne dust and contaminants.

GLO 17.2: Describe collision repair and refinishing technology's **sustainability practices** and **impact on the environment**.

SLO 11A.17.2.1: Follow environmentally appropriate procedures in the disposing and recycling of hazardous materials.

Goal 18: Demonstrate an awareness of **ethical and legal standards** as they pertain to collision repair and refinishing technology.

GLO 18.1: Practise **ethical and legal standards** as they pertain to collision repair and refinishing technology.

SLIO 11A.18.1.1: Discuss circumstances under which police reports are required.

Goal 19: Demonstrate employability skills.**GLO 19.1: Demonstrate fundamental employability skills.**

- SLO 11A.19.1.1: Demonstrate regular and punctual attendance.
 - SLO 11A.19.1.2: Demonstrate the ability to communicate respectfully and effectively with teachers, supervisors, co-workers, and students.
 - SLO 11A.19.1.3: Demonstrate accountability by taking responsibility for own actions.
 - SLO 11A.19.1.4: Demonstrate adaptability, initiative, and effort.
 - SLO 11A.19.1.5: Demonstrate teamwork skills.
 - SLO 11A.19.1.6: Demonstrate the ability to stay on task and effectively use time in class and work environments.
 - SLO 11A.19.1.7: Demonstrate the responsible use of wireless communication devices.
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GLO 19.2: Demonstrate an awareness of cultural proficiency and its importance in the workplace.

- SLO 11A.19.2.1: Discuss how people's culture affects their values and behaviour.
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GLO 19.3: Demonstrate an understanding of the business operation of a collision repair and refinishing technology facility.

- SLO 11A.19.3.1: Identify types of documents and describe the procedures used to interpret them. (A5.3)
 - SLO 11A.19.3.2: Describe the procedures used to prepare documentation. (A5.4)
 - SLO 11A.19.3.3: Describe procedures for ordering parts and materials. (A5.5)
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GLO 19.4: Demonstrate critical thinking skills in planning, procedures, analysis, and diagnosis.

- SLO 11A.19.4.1: Discuss the need for critical thinking.
 - SLO 11A.19.4.2: Discuss the need for problem-solving skills.
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Goal 20: Demonstrate an understanding of the **evolution** of collision repair and refinishing technology, including its **technological progression and emerging trends**.

GLO 20.1: Describe the **evolution** of collision repair and refinishing technology, including its **technological progression and emerging trends**.

SLO 11A.20.1.1: Discuss the evolution of collision repair, including its technological progression and emerging trends.
