Grades 9 to 12 Collision Repair and Refinishing

Manitoba Technical-Vocational Curriculum Framework of Outcomes

Interim

Manitoba

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This resource is available on the Manitoba Education and Early Childhood Learning website at www.edu.gov.mb.ca/k12/cur/teched/sy_tech_program.html.

Available in alternate formats upon request.

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Members of the 2022 Curriculum Revision Committee

Ron Auselin	St. James Collegiate St. James-Assiniboia School Division
Carl DeCosse	Crocus Plains Regional Secondary School Brandon School Division
Daniel Labossiere	Kildonan East Collegiate River East Transcona School Division
Leonard Reimer	Red River College Polytechnic
Dale Schettler	Morris School Red River Valley School Division

Technical-Vocational Education Overview

In 2013, Manitoba Education released the document *Technical-Vocational Education Overview* (see www.edu.gov.mb.ca/k12/cur/teched/sy_tech_program.html) to provide the philosophical and pedagogical underpinnings for curriculum development and the teaching of courses in the Senior Years Technology Education Program (SYTEP). This overview provides educators with the vision and goals of technical-vocational education (TVE) in Manitoba. Topics include the following:

- curriculum revitalization and renewal
- curriculum framework and implementation
- articulation of programming
- assessment and reporting
- safety
- employability/essential skills and career development
- sustainable development

TVE clusters of courses are designed to encourage students to explore career options and to address labour shortages in these vocational areas. The TVE curriculum includes course clusters for both trades (those designated for apprenticeship training and certification by Apprenticeship Manitoba) and non-trade occupations (those not designated as trades by Apprenticeship Manitoba). TVE curriculum is significantly different from other subject areas such as industrial arts. It has distinct qualities that, when respected, will provide students with a uniquely valuable experience that they cannot receive from any other curriculum.

TVE gives students the opportunity to learn the theoretical and practical aspects of one trade or non-trade occupation in order to facilitate their transition from school to work or to post-secondary education in that occupation, or into an associated one. This transition is accomplished by having students complete an entire TVE cluster of courses, learning from industry-certified teachers with industry experience in a setting that, as much as possible, emulates an actual workplace. TVE curriculum includes Grades 9 to 12 courses in a variety of trades and non-trade occupations, including collision repair and refinishing.

Senior Years Technology Education Program (SYTEP) Diploma

Students who complete eight required courses from one approved technical-vocational cluster are eligible to receive a SYTEP diploma. (The optional Grade 9 course is *not* required.) They also need to complete the 17 compulsory credits and five optional credits. (Students can also earn a SYTEP diploma by successfully completing eight applied commerce education courses.) For more information about Technology Education Program graduation requirements, visit www.edu.gov.mb.ca/k12/policy/gradreq/docs/grad_req_te_new.pdf.

Collision Repair and Refinishing (CRR) Overview

Grades 9 to 12 Collision Repair and Refinishing: Manitoba Technical-Vocational Curriculum Framework of Outcomes identifies the goals, general learning outcomes (GLOs), and specific learning outcomes (SLOs) for nine collision repair and refinishing (CRR) courses. Manitoba Education and Early Childhood Learning developed this framework for use in all Manitoba schools teaching CRR as part of the Senior Years Technology Education Program (SYTEP). Like all other technical-vocational education (TVE) clusters, schools need approval from Manitoba Education and Early Childhood Learning to teach CRR courses. Schools also need to offer the complete cluster of eight required courses (the Grade 9 course is optional). This is one of several unique features of TVE.

Descriptions of the Two CRR Trades

CRR provides a foundation for students to go directly to work, and/or to continue into post-secondary training to become a motor vehicle body repairer (metal and paint) or an automotive painter journeyperson. Here are descriptions of both trades.

Motor Vehicle Body Repairer (MVBR)

As described by Apprenticeship Manitoba, "Motor vehicle body repairers restore the structural integrity of damaged vehicles by straightening frames, fixing minor body damage, removing badly damaged sections and priming and painting all repaired surfaces. As a motor vehicle body repairer, you will also repair and/or replace vehicle glass and interior and exterior components of the vehicle. Duties also include verifying dimensional accuracy, system functions, passenger protection, proper alignment and proper handling.

"Employers include auto body repair shops, auto dealerships, specialty automobile shops and public transit systems."

Automotive Painter (AP)

As described by Apprenticeship Manitoba, "Motor vehicle body painters sand, fill, prime, finish and paint motor vehicles. They handle exterior trim and hardware, apply decals, transfers and stencils, and clean and maintain spray guns, spray booths and other equipment.

"Auto body repair shops, auto dealerships, specialty automobile shops and public transit systems all employ motor vehicle body painters."

2023 Revisions

The previous version of this curriculum (released in 2015) was based on Apprenticeship Manitoba's 2011 technical training standards for two trades—automotive painter and motor vehicle body repairer (body and paint). The Level 1 technical training standards at that time were identical for both trades. The term "common core Level 1" describes this arrangement.

The technical training standards for both trades were revised in 2020, resulting in the elimination of the common core Level 1 for the two CRR trades. The two CRR trades now have different Level 1 technical training standards. (Other revisions were as a result of the National Red Seal Harmonization Initiative, which aligned trades training in each territory and province across Canada.)

During the 2020/2021 and 2021/2022 school years, Manitoba Education and Early Childhood Learning struck a committee of CRR educators to revise the high school curriculum in order to reflect the changes to the Level 1 technical training documents from Apprenticeship Manitoba in both trades. This 2023 version of the high school curriculum reflects these changes. This curriculum includes **all of the content** from the Level 1 technical training standards for **both trades**. This provides CRR students in Manitoba the opportunity to complete their Level 1 technical training in the two CRR trades while attending high school.

CRR as a Technical-Vocational Education (TVE) Cluster

Grades 9 to 12 Collision Repair and Refinishing: Manitoba Technical-Vocational Curriculum Framework of Outcomes has been developed as a technical-vocational education cluster of courses.

Like all other TVE courses, the CRR courses should be taught only as part of a complete cluster, approved by Manitoba Education and Early Childhood Learning.

The CRR curriculum provides specific collision repair and refinishing training, and, because it includes all of the Level 1 objectives from the technical training for both motor vehicle body repairer (metal and paint) and automotive painter, it prepares students for apprenticeship in both of these trades.

Level 1 Apprenticeship in the Two CRR Trades

This high school curriculum contains **all of the objectives** from the Level 1 technical training for the following trades:

- Motor Vehicle Body Repairer (metal and paint) (MVBR) www.gov.mb.ca/aesi/apprenticeship/discover/mbtrades/motorvehicbodyrepair.html
- Automotive Painter (AP) www.gov.mb.ca/aesi/apprenticeship/discover/mbtrades/autopainter.html

Students have the opportunity to work as apprentices in **one** of the trades. For more information on apprenticeship, please see www.gov.mb.ca/aesie/apprenticeship/discover/index.html.

Under the following conditions, students have the opportunity to earn their Level 1 apprenticeship technical training in these two CRR trades:

1. Students need to complete the **eight required courses**—those in Grades 10 to 12—with a **cumulative mark of 70%** or higher. (The Grade 9 course is optional.)
2. The eight required courses must have an S (Specialized) or E (EAL) designation.

3. Apprenticeship Manitoba needs to have **accredited the school's program**. The high schools whose programs are accredited are listed at the bottom of these pages: www.gov.mb.ca/aesi/apprenticeship/discover/mbtrades/motorvehicbodyrepair.html and www.gov.mb.ca/aesi/apprenticeship/discover/mbtrades/autopainter.html.

Teachers requesting accreditation for their program need to refer to the completed *Unit to Course Comparison (UCC) Form – CRR Level 1*, available at www.edu.gov.mb.ca/k12/cur/teched/sytep/collision/index.html. This form lists where each Apprenticeship Manitoba Level 1 objective is taught in the eight required courses. This information is essential for accreditation. For more information on accreditation, see "Information for Instructors and Educators" on the Apprenticeship Manitoba website at www.gov.mb.ca/aesi/apprenticeship/generalinfo/instructoreducators.html.

Specialized (S) or EAL (E) Designation Required for Level 1 Accreditation

All courses in this cluster are designated as S (Specialized), E (EAL), or M (Modified). Students who successfully complete the eight required courses with all of them designated S or E may be eligible for Level 1 technical training accreditation from Apprenticeship Manitoba in the two CRR trades. This is because the S- and E-designated courses contain **the entire Level 1 technical training curriculum** prescribed by Apprenticeship Manitoba. However, students who complete the cluster with one or more M-designated courses are **not** eligible for Level 1 accreditation.

CRR Knowledge, Skills, and Opportunities

CRR courses provide students with a hands-on approach to learning by developing their skills while working on vehicles. Graduates are typically employed by collision repair and refinishing facilities, Manitoba Public Insurance, parts suppliers, vehicle manufacturers, after-market suppliers, recyclers, and auto body suppliers. Graduates also have the option of self-employment.

Students will develop the basic knowledge and skills necessary to weld, repair, and replace damaged body panels and assemblies, to operate hydraulic body and frame straightening equipment, and to prepare and paint vehicles.

Graduates will be able to demonstrate the following:

- ability to communicate and work with peers and supervisors
- ability to think critically
- ability to work independently or as part of a team
- time management skills
- mechanical aptitude and manual dexterity
- problem-solving skills
- employability skills

CRR Teacher Qualifications

Only vocationally certified teachers are allowed to teach TVE courses, including the ones in this cluster. Vocational certification for CRR includes three components:

1. **Journeyperson Certification** in **both trades** (motor vehicle body repairer [metal and paint] and automotive painter): CRR teachers need to have personally achieved certification as journeypersons in both of these trades so that they can share that experience with their students.
2. **Industry Experience:** CRR teachers need to have been employed in the industry for the equivalent of **at least six years** (including the time that they spent as apprentices). This will enable them to share their industry experience with students to prepare them for working in the industry.
3. **Technical Vocational Teaching Certificate:** All TVE teachers need to earn their technical vocational teaching certificate, obtained by completing Red River College Polytechnic's one-year Technical Vocational Teacher Education diploma program, or be enrolled in the program. For information about this program, see https://catalogue.rrc.ca/Programs/WPG/FullTime/TECVF-DP.

Employing only vocationally certified teachers to teach TVE courses preserves the integrity of TVE programming by ensuring that teachers are able to share their first-hand experience, as well as their familiarity with industry certification. Students receive instruction from somebody who has been involved in that industry. School boards risk significant liability if they employ non–vocationally certified teachers to teach TVE courses. Vocational certification confirms that a teacher has the requisite skills and knowledge to teach the health, safety, and security concerns. For further information, see sections 6 and 12(1) of the *Teaching Certificates and Qualifications Regulation (115/2015) of The Education Administration Act* (C.C.S.M. c. #10) at https://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=115/2015, and page 23 of *Subject Table Handbook: Technology Education* at www.edu.gov.mb.ca/k12/docs/policy/sthte/docs/sthte_2022-2023.pdf.

Comparison of TVE CRR with Industrial Arts Power Mechanics Technology

Like all TVE curricula, this one has been developed to prepare high school students for a career in a specific occupation. In this case, students learn the knowledge, skills, and attitudes required to work in the CRR trades. It has not been developed as a general interest cluster of courses about motor vehicles. Schools interested in teaching such a course are invited to teach the industrial arts curricula, which can be found on the department's website at www.edu.gov.mb.ca/k12/cur/teched/ind_arts.html.

Although CRR and industrial arts power mechanics technology curricula share some common content, they have been developed for completely different purposes and have significant differences. The chart on the following page summarizes some of the differences between CRR (as a TVE cluster) and power mechanics technology (as an industrial arts cluster).

TVE CRR and Industrial Arts Power Mechanics Technology Comparison Chart

Frequently Asked Questions	TVE Collision Repair and Refinishing	Industrial Arts Power Mechanics Technology
1. Is the purpose to facilitate students' transition to the two CRR trades?	Yes	No
2. Does the instruction try to emulate, as far as possible, a regular workplace?	Yes	No
3. Does the curriculum mandate employability skills such as punctuality and time management?	Yes	No
4. Is the teacher required to be a journeyperson in both of the CRR trades?	Yes	No
5. Is the teacher required to have experience working in the CRR trades?	Yes	No
6. Does the cluster prepare students for certification as a journeyperson in one of the CRR trades?	Yes	No
7. Does the cluster focus on preparing students for entry-level employment as an apprentice in one of the CRR trades after high school?	Yes	No
8. Is the teacher required to have a Manitoba general teacher certificate?	No	Yes
9. Is the teacher required to have a Manitoba technical vocational teacher certificate?	Yes	No
10. Do schools require special permission from Manitoba Education and Early Childhood Learning to offer the cluster of courses?	Yes	No
11. Do schools have to offer all of the courses in the cluster?	Yes	No
12. Can schools offer hybrid clusters, made up of courses from several clusters?	No	Yes
13. Will students receive a Senior Years Technology Education Program (SYTEP) Diploma when they complete a cluster of courses?	Yes	No

Curricular Competencies

Manitoba Education and Early Childhood Learning is developing the *Framework for Learning* (see www.edu.gov.mb.ca/k12/cur/framework/index.html) that is inclusive of the four Kindergarten to Grade 12 program offered in Manitoba: English Program, French Immersion Program, François Program, and Senior Years Technology Education Program (see www.edu.gov.mb.ca/k12/cur/programs.html). Each program maintains the same solid foundation of goals, global competencies, learning experiences and assessment, and evaluation and reporting, as well as a consistent curriculum structure. This interim document, *Grades 9 to 12 Collision Repare and Refinishing*, has been developed for implementation in classroom, and its structure will be revised once the *Framework* is finalized.

Collaboration

Collaboration is central to the work of CRR technicians, and is taught mainly in GLOs 18.1 (fundamental employability skills) and 18.2 (culture and diversity). This curriculum emphasizes collaboration because CRR technicians do the following:

- Establish and cultivate professional rapport with employers, co-workers, apprentices, suppliers, clients, and others.
- Work as members of teams.
- Respect the opinions of others, including those from different cultures.

Communication

Communication is indispensable to all citizens, including CRR technicians, because they need to communicate effectively in order to provide useful services. Communication is taught mainly in GLO 14.1 (transferable literacy cross-curricular knowledge and skills) and under GLO 18.1 (fundamental employability skills). This curriculum emphasizes communication because CRR technicians do the following:

- Apply effective communication skills, both in person and using various technologies.
- Read, interpret, communicate, and apply information related to products, equipment, supplies, and so on.
- Identify relevant service information and apply that information to solve workplace problems.
- Use knowledge and skills from the language arts, such as speaking, listening, reading, writing, and so on.

Creativity

Collision repair and refinishing can involve forms of artistic expression, focusing on the esthetic pleasures produced by the colours, trims, hardware, decals, transfers, and stencils that the technicians apply to vehicles. Creativity is taught throughout this curriculum.

This curriculum emphasizes creativity because CRR technicians do the following:

- Apply colour theory to select, mix, and blend paint in order to achieve the client's desired colour.

- Ensure that the vehicle is visually appealing once it has been repaired and/or refinished.
- Take risks in expressing their curiosity and proposing new ideas, even when the feedback is negative.
- Discuss and propose creative solutions to problems.

Connection to Self

Connection to self is taught in GLO 15.1 (scope of collision repair and refinishing), GLO 15.2 (career and training opportunities), GLO 17.1 (ethical and legal standards), and GLO 18.1 (fundamental employability skills). This curriculum emphasizes connection to self because CRR technicians do the following:

- Know themselves and their trade(s) well enough that they can make an informed decision regarding their career.
- Understand how their trade contributes to human health and well-being.
- Make ethical decisions.
- Understand opposing ethical points of view.

Citizenship

Citizenship is central to the two CRR trades because motor vehicles are an important part of people's lives. Those working in these trades perform important services related to the maintenance of vehicles, keeping vehicles safe, and improving the appearance of vehicles. Parts of citizenship are taught under GLO 16.1 (human health and well-being), GLO 16.2 (sustainability practices and impact on the environment), and GLO 18.2 (culture and diversity). This curriculum emphasizes citizenship because CRR technicians do the following:

- Understand, appreciate, and interact with people from cultures or belief systems different from their own.
- Make the most of their workplace's culture to improve its working conditions.
- Adjust their sustainability practices to minimize its impacts on the environment.
- Follow sustainable business practices so that their business thrives in order to continue to employ staff and produce valuable services for their customers.
- Consider long-term health concerns related to harmful substances as they perform their work.

Critical Thinking

CRR technicians need to be able to think critically in order to solve complex problems for which solutions take several steps, and which might need input from several people, as well as additional resources. The process is unbiased and rational. It is taught under GLO 18.3 (critical thinking skills). This curriculum emphasizes critical thinking because CRR technicians have to be able to do the following:

- Solve problems associated with tasks such as making structural repairs, diagnose issues related to surface preparation and paint failure, and so on.
- Solve problems by focusing only on the facts, not allowing any biases to interfere with that process.

- Solve complex problems that require multiple steps, and additional assistance and resources.

How This CRR Framework Is Organized

TVE frameworks, including this one, are organized into course goals, general learning outcomes (GLOs), and specific learning outcomes (SLOs).

CRR Course Goals

The goals for all TVE curricula represent the broadest aims of that cluster of courses. As stated in the *Technical-Vocational Education Overview* document, "Course goals are broken down into general learning outcomes, which are broken down into specific learning outcomes" (7).

Goals consist of one or more GLOs. If there are only a few SLOs under that goal, then there is only one GLO, which is identical to the goal. When there are a large number of SLOs, they are usually organized logically under two or more GLOs.

General Learning Outcomes (GLOs)

As stated in the *Technical-Vocational Education Overview* document, "General learning outcomes (GLOs) are overarching statements about what students are expected to learn in each course. They identify the broad categories of knowledge, skills, and attitudes that students are expected to learn and are able to demonstrate in a subject area or course" (8). GLOs are used to organize SLOs. In certain courses, some GLOs are not listed because there are no SLOs under that GLO.

Curriculum Goals and General Learning Outcomes

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

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

Goal 2: Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**.

GLO 2.1: Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**.

Goal 3: Demonstrate the knowledge and skills required for vehicle **damage analysis** and **repair estimation**.

GLO 3.1: Demonstrate the knowledge and skills required for vehicle **damage analysis**.

GLO 3.2: Demonstrate the knowledge and skills required for vehicle **repair estimation**.

Goal 4: Demonstrate the knowledge and skills required to perform **welding** procedures.

GLO 4.1: Demonstrate the knowledge and skills required to perform **welding** procedures.

Goal 5: Demonstrate the knowledge and skills required to perform **structural repairs**.

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

GLO 5.2: Demonstrate the knowledge and skills required to perform **measuring and gauging**.

GLO 5.3: Demonstrate the knowledge and skills required to perform **structural repairs**.

Goal 6: Demonstrate the knowledge and skills required to perform **sheet metal repairs**.

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

GLO 6.2: Demonstrate the ability to perform **sheet metal repairs**.

Goal 7: Demonstrate the knowledge and skills required to repair **plastic and composite** panels.

GLO 7.1: Demonstrate the knowledge and skills required to repair **plastic and composite** panels.

Goal 8: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**.

GLO 8.1: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**.

Goal 9: Demonstrate the knowledge and skills required to select and use **fasteners**.

GLO 9.1: Demonstrate the knowledge and skills required to select and use **fasteners**.

Goal 10: Demonstrate the knowledge and skills required to repair and replace **glass**, **upholstery**, **trim**, **hardware**, and **other components**.

GLO 10.1: Demonstrate the knowledge and skills required to repair and replace **glass**, **upholstery**, **trim**, **hardware**, and **other components**.

Goal 11: Demonstrate the knowledge and skills required for **surface preparation**.

GLO 11.1: Demonstrate the knowledge and skills required for **surface preparation**.

Goal 12: Demonstrate the knowledge and skills required for **refinishing and post-refinishing**.

- **GLO 12.1:** Demonstrate the knowledge and skills required for **refinishing and post-refinishing**.

Goal 14: Describe and demonstrate transferable **cross-curricular** knowledge and skills.

- **GLO 14.1:** Apply the transferable **literacy** cross-curricular knowledge and skills to collision repair and refinishing.
- **GLO 14.2:** Apply the transferable **numeracy** cross-curricular knowledge and skills to collision repair and refinishing.
- **GLO 14.3:** Apply the transferable **scientific** cross-curricular knowledge and skills to collision repair and refinishing.

Goal 15: Demonstrate an understanding of the **scope** of collision repair and refinishing, including **training and career opportunities** and **working conditions**.

- **GLO 15.1:** Demonstrate an understanding of the **scope** of collision repair and refinishing, and of associated occupations.
- **GLO 15.2:** Demonstrate an understanding of **training and career opportunities** and **working conditions** in collision repair and refinishing, and in associated occupations.

Goal 16: Demonstrate an awareness of **sustainability**.

- **GLO 16.1:** Describe the effects of collision repair and refinishing on **human health and well-being**, including on tradespersons working in the field and those who use their services.
- **GLO 16.2:** Describe collision repair and refinishing's **sustainability practices** and **impact on the environment.**

Goal 17: Demonstrate an awareness of **ethical and legal standards** as they pertain to collision repair and refinishing.

- **GLO 17.1:** Practise **ethical and legal standards** as they pertain to collision repair and refinishing.

Goal 18: Demonstrate the **skills for success**.

- **GLO 18.1:** Demonstrate fundamental **employability skills.**
- **GLO 18.2:** Demonstrate an awareness of **culture and diversity** and their importance in the workplace.
- **GLO 18.3:** Demonstrate **critical thinking skills** in analysis, diagnosis, and problem solving.

Goal 19: Demonstrate an understanding of the **evolution** of collision repair and refinishing, including its **technological progression and emerging trends**.

- **GLO 19.1:** Describe the **evolution** of collision repair and refinishing, including its **technological progression and emerging trends**.

Specific Learning Outcomes (SLOs)

Specific learning outcomes (SLOs) define what students are expected to achieve by the end of a course. Teachers teach and assess each SLO.

Most SLOs are found in only one course. However, some SLOs are repeated, especially those dealing with safety practices and employability skills, in several courses in order to emphasize their importance.

In order to emphasize and simplify the correlation between this document and the technical training from Apprenticeship Manitoba, this document has, as much as is practical, kept all of the objectives from each unit together under one GLO, even when some of the objectives might be more logically placed under a different GLO.

When all objectives from one Apprenticeship Manitoba Level 1 unit are listed together in one course, a heading has been placed above that list, along with the total number of hours allocated by Apprenticeship Manitoba for the trade that requires the **highest number of hours**, so that students will receive the required amount of instruction in both trades.

For example, a Repair Materials unit is taught in both trades. In MVBR, it is taught in Unit A13, and requires 21 hours of instruction. In AP, it is taught in Unit A11, and requires 35 hours of instruction. Therefore, in order to complete the Level 1 requirements in both trades, teachers need to teach the Repair Materials Unit for 35 hours.

So, course 9029 includes the following subheading:

MVBR A13 Repair Materials
AP A11 Repair Materials
(35 hours)

Creating SLOs from Apprenticeship Manitoba Objectives

To align the high school curriculum with the Apprenticeship Manitoba Level 1 technical training for both CCR trades, all of the **Apprenticeship Manitoba objectives** are included in the high school curriculum verbatim. These objectives become some of the **high school curriculum's specific learning outcomes** (SLOs). An **alphanumeric code** (for example, MVBR A1.1; AP A1.1) is included at the end of the SLO, which indicates the trade, the unit, and the objective from which they were taken. Other SLOs related to collision repair and refinishing that are not from Apprenticeship Manitoba do not have the alphanumeric code.

This curriculum contains all of the objectives from the Level 1 technical training standards for both CRR trades. These two documents are somewhat similar, so most of the SLOs are found in each one. Two notable exceptions are the SLOs taken from Unit A4: Cutting and Heating and Unit A5: Gas Metal Arc Welding (GMAW [MIG]) I. These units are found only in the MVBR Level 1.

In some cases, an objective in one trade was similar to an objective in the other trade, but included more content. In those instances, **all of the content from both trades was combined**, so that students would have the opportunity to complete their Level 1 technical training in both trades.

For example, here is SLO 12D.15.1.1 from 9036 Colour Theory and Career Preparation:

> 12D.15.1.1 Describe the structure and scope of the motor vehicle body repairer (metal and paint) and automotive painter trades. (MVBR & AP A1.1)

MVBR indicates that it is taken from the MVBR Level 1 technical training standards.

AP indicates that it is taken from the AP Level 1 technical training standards.

A1.1 indicates that the SLO is **Objective 1** from **Unit A1 Learning About Work** from the 2020 versions of *Motor Vehicle Body Repairer (Metal and Paint): Level 1* and *Automotive Painter: Level 1*. One names motor vehicle body repairer (metal and paint), while the second one names automotive painter. In this curriculum, we have combined them by naming both trades.

The Level 1 documents also include the following **essential content under A1.1**:

a. The Apprenticeship and Certification Act
   - Apprenticeship and Certification Board and Provincial Advisory Committees
   - General and specific trade regulation
   - Policies regarding attendance, evaluation procedures, conduct and progression requirements (Apprenticeship Manitoba, Training provider)

b. Uses of the Red Seal Occupational Standard (RSOS)
   - Technical training in-school curriculum
   - On-the-job record book of hours (Manitoba blue book)
   - Examinations (level placement tests, final certification examinations)

c. Opportunities and future career options
   - Generalists and specialists. The move toward specialization is well known to modern tradespeople. Some prefer to specialize and others want to do it all. Supervisory positions require a broad scope.
   - Lead hands and other immediate supervisors. Apprentices need to know how to become a lead-hand as much as they need to know the benefits and pit-falls of leadership between management and shop floor workers.
   - Geographic mobility. What does it mean to a construction/industrial worker to have to travel to find work? Are there more opportunities if they do? What are they? What are the drawbacks to being away from home for several weeks at a time?
   - Job hierarchies and innovations. What trade-specific special training opportunities are available in your trade? Is there travel involved? Is there an opportunity to move up the ladder on a work crew as opposed to staying in the shop?

SLOs: Demonstrating Awareness versus Demonstrating Understanding

This curriculum often contains almost identical SLOs with only slight changes in the wording. For example, under GLO 17.2, the Grade 9 course includes this SLO: "Demonstrate an **awareness** of training and career opportunities and working conditions in collision repair and refinishing, and in associated occupations." A **corresponding** SLO is found in Grade 12, with only one word different. "Demonstrate an **understanding** of training and career opportunities and working conditions in collision repair and refinishing, and in associated occupations." This means that students are introduced to this topic in an earlier course and then learn about it in more detail in later courses.

"Demonstrate an ***awareness*** of . . ." is an entry-level SLO. It means that students need to become aware of the topic by exploring it. They do **not** need to have a comprehensive conceptual understanding of the topic. Students should end up with enough awareness of the topic to know the following:

- key information
- why it is interesting or relevant to them
- how to become better informed about it
- how it affects apprentices and journeypersons

"Demonstrate an ***understanding*** of . . ." is a higher-level term. Students need to have a deeper conceptual understanding of this topic than of those SLOs that begin with "Demonstrate ***awareness*** of . . ." For student to understand something, they need to be able to reflect on it, analyze it, and apply it in order to solve a problem.

Order of Teaching SLOs

This curriculum is not sequential. In other words, teachers might teach learning outcomes in an order different from how they appear in the document.

Cross-Curricular SLOs

Cross-curricular learning outcomes include essential skills from subject areas including, but not limited to, English language arts, mathematics, and the sciences. Teachers should integrate these essential skills into the authentic experiences of the courses, along with learning outcomes dealing with the following topics:

- health and safety
- evolution, technological progression, and emerging trends
- sustainability
- ethical and legal standards
- employability skills
- the CRR industry

The Two Formats: Multi-course and Individual Course

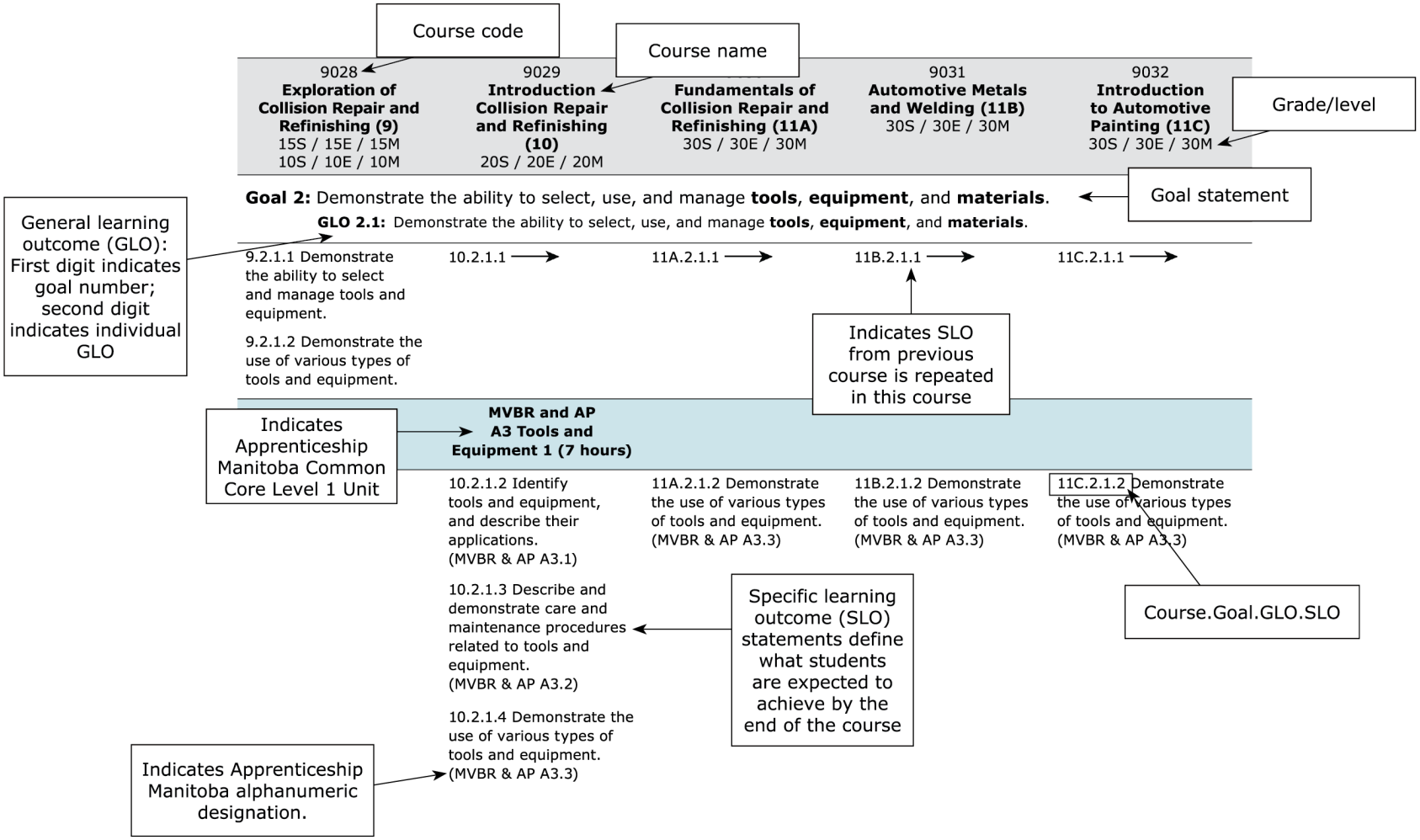
This curriculum is available in two formats:

- The **multi-course format** comprises either five columns (one course each in Grades 9 and 10, and three in Grade 11) or four columns (the four Grade 12 courses). It is found in this document, starting on page 25.
- The **individual-course** files are made up of **one course per file**. These nine files, along with this multi-course document, are available at www.edu.gov.mb.ca/k12/cur/teched/sytep/collision/index.html.

The most important difference is that the **multi-course files do not contain all of the detailed content** associated with each SLO. Instead, they contain only the SLOs. That detailed content is found only in the individual-course files. Therefore, **teachers need to use the individual-course files**.

The multi-course format does not contain all of the content simply because there is not enough room for it. If it were to contain all of the content, some individual SLOs and their content would fill a narrow column for several pages, making them difficult to navigate. The multi-course format is very useful, however, because it allows teachers to compare the four or five courses listed there, and to see how students progress from one course to the next within each goal and general learning outcome.

Guide to Reading CRR Goals and Learning Outcomes



Additional Information and Resources for Teaching Selected GLOs

The following information and resources are provided to help CRR teachers teach certain GLOS.

GLOs 1.1, 15.1, 15.2, and 18.1: Young Worker Readiness Certificate Course

The government of Manitoba, in partnership with SAFE Work Manitoba, has launched a new Young Worker Readiness Certificate Course in order to "prepare young Manitobans for entering the workforce and help keep them safe." Youth can complete the course online. CRR teachers might find this course helpful in teaching GLOs 1.1, 15.1, 15.2, and 18.1. A link to the course materials can be found at the bottom of this page: www.edu.gov.mb.ca/k12/cur/cardev/safety.html.

GLO 1.1: *Building a Safer Workplace* Workshop Manual (2020)

SAFE Work Manitoba has released *Building a Safer Workplace* workshop manual (2020), as a resource to teach safety in the workplace, and it is available online at www.gov.mb.ca/aesi/apprenticeship/pdfpubs/pubs/general/trade_safety/building_a_safer_workplace_workshop_manual.pdf.

GLO 4.1: A Note regarding Welding

GLO 4.1 consists largely of MVBR technical training Level 1 Units A4 and A5, and is taught mainly in course 9031 Automotive Metals and Welding (11B). Note that welding is not taught in the automotive painter technical training Level 1.

GLO 15.1: Teaching the Scope of the Two CRR Trades

The scope of the two CRR trades includes general aspects of the trades that high school students are likely unaware of, and are unlikely to inquire about. Topics include the following:

- What are the working conditions typically associated with these trades? Do apprentices and journeypersons often work outside? Do they work different shifts? Are they on call?
- What salaries are typical in these trades? Do they vary much? If so, under which conditions?
- Which types of organizations typically employ apprentices and journeypersons in these trades? Where do they work?
- Are there specialists in these trades? If so, in what do they specialize? What are their working conditions and salaries?
- Do apprentices and journeypersons typically have to travel far to the workplace? If so, what are the consequences of being away from home for long periods of time?

- What are the opportunities for becoming a supervisor or business owner in these trades?
- Are apprentices and journeypersons typically unionized? How are the salaries and working conditions of unionized tradespersons different from the non-unionized?
- What are some of the organizations associated with these trades (industry groups, trade associations, etc.)? What roles do these organizations play?

GLO 15.2: Teaching about Apprenticeship

The Canadian Apprenticeship Forum / Le Forum canadien sur l'apprentissage (CAF-FCA) is "a non-profit organization that connects Canada's apprenticeship community" (https://caf-fca.org/about/). Information about CAF-FCA is listed in this document because it contains current, valuable resources for teachers and students regarding trades and apprenticeship, including the following:

- Canadian Apprenticeship Forum: https://caf-fca.org/
- Careers in Trades: https://careersintrades.ca/
- *Talk to a Trade* videos: https://careersintrades.ca/resources/videos/
- *Apprenticeship and Careers in the Skilled Trades: A Guide for Educators*: https://careersintrades.ca/wp-content/uploads/2021/11/Educator-Guide-EN-FINAL.pdf
- *Apprenticeship: Post-Secondary Education That Matters! An Educator's Guide to Careers in the Skilled Trades*: https://careersintrades.ca/wp-content/uploads/2018/10/CAF_Educator_Guide-EN.pdf

GLO 15.2: Teaching about Red Seal

Because the two CRR trades are designated Red Seal trades across Canada, the Apprenticeship Manitoba curriculum is aligned with the Canada-wide Red Seal curriculum. High school CRR teachers, as well as students working towards their Level 1 apprenticeship in the trades, can find valuable resources, such as sample examination questions used on Red Seal examinations, in the following sections of the Red Seal website:

- Auto Body and Collision Technician: www.red-seal.ca/eng/trades/mvbr.shtml
- Automotive Refinishing Technician: www.red-seal.ca/eng/trades/.1.5t.4p.1.3nt.shtml

Please note that the three organizations—Red Seal, Apprenticeship Manitoba, and Manitoba Education and Early Childhood Learning—use slightly different names for these trades.

GLO 17.1: Teaching Ethics

Ethics can be defined as a person's or group's **moral principles** that direct their behaviour. Most people share similar ethics, even if they are from different backgrounds. For example, most people are in favour of the Golden Rule, "Do to others as you would have others do to you."

Examples of ethical characteristics include the following:

- caring for others
- awareness of others and their needs
- courage
- integrity
- honesty
- citizenship
- fairness
- responsibility
- transparency
- loyalty
- respect
- inclusiveness

The ultimate goal of TVE is to help students live a productive, fulfilling life while providing useful and valuable products and services, thereby contributing to the greater welfare of society. This can only be done if they act in an ethical manner. Since TVE curriculum focuses on preparing students for the workplace, students need to understand ethics, and to act ethically in order to coexist peacefully with others and achieve their full potential

An individual's personal ethics are based on a number of factors, including the culture(s) to which they belong. In a pluralistic society like ours, different cultures have different ethical standards. Students need to understand that there are various points of view, and they should be encouraged to ask others for their points of view and to take those into consideration when formulating their own.

Here are some ethical issues that can be found in the workplace, including the CRR industry:

- taking paid sick leave when you are not sick
- stealing
- overcharging for hours, parts, services, and so on
- inappropriate use of electronic devices
- not putting in a full day's work
- shoddy work
- disrespecting or discriminating against others
- avoiding a situation out of fear
- using used parts when the customer assumes that you will be using new parts
- inappropriately disclosing confidential information or gossiping
- dishonesty

- acting in an environmentally unethical manner (ignoring environmental regulations, illegal dumping, wasting resources, etc.)
- not demonstrating empathy when it would be appropriate to do so

GLO 18.2: Teaching Diversity and Culture

Diversity refers to the practice of including people from a range of backgrounds, including, but not limited to culture, age, gender identity, sexual orientation, physical attributes, physical ability, values, and political beliefs.

Whereas diversity can refer to the differences among **individuals**, culture refers to the characteristics of **groups** of people. Cultures are determined by factors including, but not limited to, race, ethnicity, nationality, gender, sexual orientation, religion, and social class. People typically belong to more than one culture.

To succeed at school and in the workplace, students need to be able to understand, appreciate, and interact with people from cultures or belief systems different from their own. That is cultural proficiency. Cultural proficiency acknowledges and respects diverse cultures. It is more than tolerance, which involves putting up with differences.

Workplace culture is also complex. It refers to the attitudes, values, and behaviours found in a specific organization, occupation, or workplace. To thrive in a particular workplace, a worker should understand the culture of their workplace and should be able to thrive in it.

Manitoba Education and Early Childhood Learning's website on diversity education, found at www.edu.gov.mb.ca/k12/diversity/educators/index.html, provides diversity-related resources for educators and youth.

GLO 18.3: Teaching Critical Thinking

To succeed in life, school, and the workplace, students need to be able to think critically in order to solve problems, including complex problems for which solutions take several steps and which might need input from several people. One of the main uses of critical thinking in the workplace is in diagnosing problems and deciding on the best solution. Critical thinking is the process of analyzing facts, and then arriving at a conclusion based **only** on the facts. The process is unbiased and rational. Students with strong problem-solving skills are more likely to gather the correct information, isolate the problem, and solve it.

Problem solving has been identified as one of the Skills for Success by the Government of Canada. These are the skills that are needed for work, learning, and life. More information is available at ww.canada.ca/en/services/jobs/training/initiatives/skills-success/understanding-individuals.html.

There is more information on critical thinking in this document on page 10.

Learning Experiences

In most courses, the emphasis is for students to learn by completing tasks, as opposed to learning abstract concepts. For instructional purposes, the sequence of learning outcomes can vary based on the learning experiences within the course. Teachers should select the experiences best suited for students to learn the SLOs, based on a variety of factors including access to resources or regional interests and needs. In light of rapid changes in technology, the committee encourages teachers to update their learning experiences in order to meet the needs of students.

Course Descriptions

9028 Exploration of Collision Repair and Refinishing
15S/15E/15M
10S/10E/10M

This is an optional course intended for students wishing to sample the trades. The emphasis is on hands-on learning activities. Students will learn to follow safety procedures, select and use common hand and power tools, repair minor damage, and prepare panels for painting.

9029 Introduction to Collision Repair and Refinishing
20S/20E/20M

In this entry-level course, the emphasis is on hands-on learning activities. Students will learn to follow safety procedures, select and use hand and power tools and abrasives, repair minor damage, apply body filler, prepare panels for painting, and detail vehicles.

9030 Fundamentals of Collision Repair and Refinishing
30S/30E/30M

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.

9031 Automotive Metals and Welding
30S/30E/30M

In this course, students will learn about metallurgy, focusing on the types of metals used in vehicle construction. Students will develop welding skills while operating and maintaining different types of welding equipment, such as metal inert gas (MIG) welders, oxyacetylene welding and cutting equipment, plasma arc welding equipment, and resistance spot welding equipment.

9032 Introduction to Automotive Painting
30S/30E/30M

In this course, students will learn about corrosion, oxidation, and electrolysis, and about the theory behind corrosion protection. They will learn to select materials, tools, and

equipment for surface preparation; to clean and sand substrates; to apply masking materials; and to operate and maintain spray guns.

9033 Damage Analysis and Structural Repairs
40S/40E/40M

In this course, students will increase their knowledge of and skills in analyzing damage, planning repairs, and measuring and straightening. They will repair and replace damaged panels and structural components, repair and replace glass components, and restore corrosion protection.

9034 Weld-On and Bolt-On Panel Replacement
40S/40E/40M

In this course, students will learn to remove and replace interior/exterior trim and hardware, and to transfer components, replace bolt-on and weld-on body panels, replace outer door panels, and adjust body panels and bumper assemblies.

9035 Advanced Automotive Painting
40S/40E/40M

In this course, students will learn to prepare vehicles for spot repairs, panel repairs, blending, and complete refinishing. Students will mix and prepare paints for spraying. They will refinish, reassemble, and clean vehicles for delivery, and follow paint shop health and safety practices.

9036 Colour Theory and Career Preparation
40S/40E/40M

Students will learn colour theory and tinting principles as they spot repair and blend with refinishing materials; refinish plastic parts; perform final detailing; and correct common paint problems. They will also learn the skills required to transition from high school to the workplace and will create a portfolio and resumé.

Grades 9 to 11 Collision Repair and Refinishing

General and Specific Learning Outcomes by Goal

Grades 9 to 11 Collision Repair and Refinishing: General and Specific Learning Outcomes by Goal

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M
Goal 1: Describe and apply **health and safety** practices.				
GLO 1.1: Describe and apply **health and safety** practices.				
9.1.1.1 Describe and apply health and safety practices.	10.1.1.1 →	11A.1.1.1 →	11B.1.1.1 →	11C.1.1.1 →
9.1.1.2 Create and maintain a safe and organized working environment.	10.1.1.2 →	11A.1.1.2 →	11B.1.1.2 →	11C.1.1.2 →
9.1.1.3 Demonstrate an understanding of the safety hazards related to airbag deployment.	10.1.1.3 →	11A.1.1.3 →	11B.1.1.3 →	11C.1.1.3 →
9.1.1.4 Demonstrate an understanding of the hazards related to fuel and other flammables found in vehicles.	10.1.1.4 →	11A.1.1.4 →	11B.1.1.4 →	11C.1.1.4 →

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M

Goal 1: Describe and apply **health and safety** practices. *(continued)*

GLO 1.1: Describe and apply **health and safety** practices. *(continued)*

	MVBR and AP A2 Trade Safety Awareness (7 hours) This unit is also taught in 9032 and 9033.			**MVBR and AP A2 Trade Safety Awareness (7 hours)** This unit is also taught in 9029 and 9033.
9.1.1.5 Identify safety and health requirements.	10.1.1.5 Identify safety and health requirements. (MVBR & AP A2.1)			11C.1.1.5 Identify safety and health requirements. (MVBR & AP A2.1)
9.1.1.6 Identify personal protective equipment (PPE) and procedures.	10.1.1.6 Identify personal protective equipment (PPE) and procedures. (MVBR & AP A2.2)			11C.1.1.6 Identify personal protective equipment (PPE) and procedures. (MVBR & AP A2.2)
9.1.1.7 Identify electrical safety.	10.1.1.7 Identify electrical safety. (MVBR & AP A2.3)			11C.1.1.7 Identify electrical safety. (MVBR & AP A2.3)
9.1.1.8 Identify fire safety.	10.1.1.8 Identify fire safety. (MVBR & AP A2.4)			11C.1.1.8 Identify fire safety. (MVBR & AP A2.4)
9.1.1.9 Identify ergonomics.	10.1.1.9 Identify ergonomics. (MVBR & AP A2.5)			11C.1.1.9 Identify ergonomics. (MVBR & AP A2.5)

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M

Goal 1: Describe and apply **health and safety** practices. *(continued)*

GLO 1.1: Describe and apply **health and safety** practices. *(continued)*

	MVBR and AP A2 Trade Safety Awareness (7 hours) ***(continued)*** This unit is also taught in 9032 and 9033.		**MVBR and AP A2 Trade Safety Awareness (7 hours)** ***(continued)*** This unit is also taught in 9029 and 9033.
9.1.1.10 Hazard recognition and control.	10.1.1.10 Hazard recognition and control. (MVBR & AP A2.6)		11C.1.1.10 Hazard recognition and control. (MVBR & AP A2.6)
9.1.1.11 Hazard of confined space entry.	10.1.1.11 Hazard of confined space entry. (MVBR & AP A2.7)		11C.1.1.11 Hazard of confined space entry. (MVBR & AP A2.7)
9.1.1.12 Identify first aid/CPR.	10.1.1.12 Identify first aid/CPR. (MVBR & AP A2.8)		11C.1.1.12 Identify first aid/CPR. (MVBR & AP A2.8)
9.1.1.13 Identify the safety requirements as they apply to WHMIS.	10.1.1.13 Identify the safety requirements as they apply to WHMIS. (MVBR & AP A2.9)		11C.1.1.13 Identify the safety requirements as they apply to WHMIS. (MVBR & AP A2.9)
9.1.1.14 Identifying and controlling hazards.	10.1.1.14 Identifying and controlling hazards. (MVBR & AP A2.10)		11C.1.1.14 Identifying and controlling hazards. (MVBR & AP A2.10)

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M
Goal 2: Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**. **GLO 2.1:** Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**.				
9.2.1.1 Demonstrate the ability to select and manage tools and equipment. 9.2.1.2 Demonstrate the use of various types of tools and equipment.	10.2.1.1 →	11A.2.1.1 →	11B.2.1.1 →	11C.2.1.1 →
	MVBR and AP A3 Tools and Equipment 1 (7 hours)			
	10.2.1.2 Identify tools and equipment, and describe their applications. (MVBR & AP A3.1) 10.2.1.3 Describe and demonstrate care and maintenance procedures related to tools and equipment. (MVBR & AP A3.2) 10.2.1.4 Demonstrate the use of various types of tools and equipment. (MVBR & AP A3.3)	11A.2.1.2 Demonstrate the use of various types of tools and equipment. (MVBR & AP A3.3)	11B.2.1.2 Demonstrate the use of various types of tools and equipment. (MVBR & AP A3.3)	11C.2.1.2 Demonstrate the use of various types of tools and equipment. (MVBR & AP A3.3)

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M

Goal 2: Demonstrate the ability to select, use, and manage **tools**, equipment, and **materials**. *(continued)*

GLO 2.1: Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**. *(continued)*

	MVBR A13 Repair Materials AP A11 Repair Materials (35 hours)			
	10.2.1.5 Define terminology associated with repair materials. (MVBR A13.1; AP A11.1) 10.2.1.6 Identify hazards and describe safe work practices when using repair materials. (MVBR A13.2; AP A11.2) 10.2.1.7 Describe and demonstrate the types of repair materials, their characteristics, applications, and procedures for use. (MVBR A13.3; AP A11.3)			

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M

Goal 2: Demonstrate the ability to select, use, and manage **tools**, equipment, and **materials**. *(continued)*

GLO 2.1: Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**. *(continued)*

	MVBR A13 Repair Materials AP A11 Repair Materials (35 hours) *(continued)*	
	10.2.1.8 Identify substrate types, and describe the procedures for use and selection of repair materials. (MVBR A13.4; AP A11.4)	
	10.2.1.9 Perform the application of repair materials on an automotive panel. (MVBR A13.5; AP A11.5)	

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M
Goal 3: Demonstrate the knowledge and skills required for vehicle **damage analysis** and **repair estimation**. **GLO 3.1:** Demonstrate the knowledge and skills required for vehicle **damage analysis**.				
	10.3.1.1 Demonstrate the knowledge and skills required to identify damage on sheet metal surfaces.	11A.3.1.1 →	11B.3.1.1 Demonstrate the knowledge and skills required to identify sheet metal distortion.	11C.3.1.1 Demonstrate the knowledge and skills required to identify damage on corrosion-protected surfaces.
Goal 3.2: Demonstrate the knowledge and skills required for vehicle **repair estimation**.				
		11A.3.2.1 Demonstrate an awareness of the purpose and importance of repair estimates and work orders.		11C.3.2.1 Demonstrate the ability to estimate corrosion protection repair and replacement times, materials, and costs. 11C.3.2.2 Demonstrate the ability to estimate disposal costs.
Goal 4: Demonstrate the knowledge and skills required to perform **welding** procedures. **GLO 4.1:** Demonstrate the knowledge and skills required to perform **welding** procedures.				
9.4.1.1 Demonstrate the ability to prepare surfaces for welding.	10.4.1.1 →		11B.4.1.1 Demonstrate the ability to prepare surfaces for welding.	

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M

Goal 4: Demonstrate the knowledge and skills required to perform **welding** procedures. *(continued)*

GLO 4.1: Demonstrate the knowledge and skills required to perform **welding** procedures. *(continued)*

			MVBR A4 Cutting and Heating (7 hours)	
			11B.4.1.2 Define terminology associated with cutting and heating. (MVBR A4.1) 11B.4.1.3 Identify hazards and describe safe work practices pertaining to cutting and heating. (MVBR A4.2) 11B.4.1.4 Identify and describe the types of cutting and heating equipment. (MVBR A4.3) 11B.4.1.5 Explain and demonstrate the principles of operation of cutting and heating equipment. (MVBR A4.4)	

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M

Goal 4: Demonstrate the knowledge and skills required to perform **welding** procedures. *(continued)*

GLO 4.1: Demonstrate the knowledge and skills required to perform **welding** procedures. *(continued)*

			MVBR A4 Cutting and Heating (7 hours) *(continued)*	
			11B.4.1.6 Demonstrate and perform processes using cutting and heating equipment. (MVBR A4.5)	
			MVBR A5 Gas Metal Arc Welding (GMAW [MIG]) 1 (28 hours)	
			11B.4.1.7 Define terminology associated with GMAW. (MVBR A5.1) 11B.4.1.8 Identify hazards and describe safe work practices pertaining to GMAW. (MVBR A5.2) 11B.4.1.9 Identify and describe GMAW equipment. (MVBR A5.3)	

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M

Goal 4: Demonstrate the knowledge and skills required to perform **welding** procedures. *(continued)*

GLO 4.1: Demonstrate the knowledge and skills required to perform **welding** procedures. *(continued)*

			MVBR A5 Gas Metal Arc Welding (GMAW [MIG]) 1 (28 hours) *(continued)*	
			11B.4.1.10 Identify the types of welds performed using GMAW equipment. (MVBR A5.4) 11B.4.1.11 Describe techniques for welding automotive steels. (MVBR A5.5) 11B.4.1.12 Identify weld defects, their causes, and the procedures to prevent and correct them. (MVBR A5.6) 11B.4.1.13 Operate, troubleshoot, and maintain GMAW equipment. (MVBR A5.7) 11B.4.1.14 Describe and demonstrate various types of welds and joints. (MVBR A5.8)	

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M
Goal 5: Demonstrate the knowledge and skills required to perform **structural repairs**. **GLO 5.1:** Demonstrate an understanding of **vehicle construction**.				
		11A.5.1.1 Demonstrate an understanding of various types of vehicle construction and their characteristics. 11A.5.1.2 Demonstrate the ability to identify body sections and describe their components. 11A.5.1.3 Demonstrate an understanding of structural and non-structural components. 11A.5.1.4 Demonstrate the ability to identify and describe the types of materials used in vehicles. 11A.5.1.5 Demonstrate the ability to adjust sheet metal panels.		

9028 **Exploration of Collision Repair and Refinishing (9)** 15S / 15E / 15M 10S / 10E / 10M	9029 **Introduction Collision Repair and Refinishing (10)** 20S / 20E / 20M	9030 **Fundamentals of Collision Repair and Refinishing (11A)** 30S / 30E / 30M	9031 **Automotive Metals and Welding (11B)** 30S / 30E / 30M	9032 **Introduction to Automotive Painting (11C)** 30S / 30E / 30M
Goal 5: Demonstrate the knowledge and skills required to perform **structural repairs**. *(continued)*				
GLO 5.2: Demonstrate the knowledge and skills required to perform **measuring and gauging**.				
	10.5.2.1 Demonstrate the ability to identify and describe point-to-point measuring tools and accessories.	11A.5.2.1 Demonstrate the ability to use body-and-frame–damage measuring equipment.		
GLO 5.3: Demonstrate the knowledge and skills required to perform **structural repairs**.				
9.5.3.1 Demonstrate an awareness of the importance of restoring vehicles to manufacturer's specifications.	10.5.3.1 Demonstrate an understanding of the importance of restoring vehicles to manufacturer's specifications.	11A.5.3.1 Demonstrate an understanding of the importance of the structure of the vehicle being dimensionally correct.	11B.5.3.1 Demonstrate the ability to perform fit-up on replacement sheet metal components.	
Goal 6: Demonstrate the knowledge and skills required to perform **sheet metal repairs**.				
GLO 6.1: Demonstrate an understanding of the **properties** of metal.				
	10.6.1.1 Demonstrate the ability to identify alternative construction materials.			11C.6.1.1 Demonstrate an awareness of the processes of oxidation and electrolysis.
GLO 6.2.: Demonstrate the ability to perform **sheet metal repairs**.				

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Goal 7: Demonstrate the knowledge and skills required to repair **plastic and composite** panels.

GLO 7.1: Demonstrate the knowledge and skills required to repair **plastic and composite panels**.

	MVBR A11 Plastic and Composite Panels 1 AP A9 Plastic and Composite Panels (7 hours)	
	11A.7.1.1 Define terminology associated with plastic and composite panels and components. (MVBR A11.1; AP A9.1) 11A.7.1.2 Identify hazards and describe safe work practices when working with plastic and composite panels and components. (MVBR A11.2; AP A9.2) 11A.7.1.3 Describe the types of plastic and composite panels and their characteristics and applications. (MVBR A11.3; AP A9.3)	

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Goal 7: Demonstrate the knowledge and skills required to repair **plastic and composite** panels. *(continued)*

GLO 7.1: Demonstrate the knowledge and skills required to repair **plastic and composite panels**. *(continued)*

		MVBR A11 Plastic and Composite Panels 1 AP A9 Plastic and Composite Panels (7 hours) *(continued)*	
		11A.7.1.4 Describe, demonstrate, and perform the techniques and procedures for removing and installing plastic and composite panels and their components. (MVBR A11.4; AP A9.4) 11A.7.1.5 Describe, demonstrate, and perform types of plastic welding and adhesive repair procedures. (MVBR A11.5; AP A9.5)	

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Goal 8: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**.

GLO 8.1: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**.

	MVBR A10 Body Fillers and Abrasives AP A8 Body Fillers and Abrasives (14 hours)			
	10.8.1.1 Define terminology associated with body filler and abrasives. (MVBR A10.1; AP A8.1)			11C.8.1.1 Demonstrate the identification, selection, application, and maintenance of seam sealers.
	10.8.1.2 Identify hazards and describe safe work practices when working with body fillers and abrasives. (MVBR A10.2; AP A8.2)			
	10.8.1.3 Describe the types of body fillers and their characteristics and applications. (MVBR A10.3; AP A8.3)			

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Goal 8: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**. *(continued)*

GLO 8.1: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**. *(continued)*

	MVBR A10 Body Fillers and Abrasives **AP A8 Body Fillers and Abrasives** **(14 hours) *(continued)***			
	10.8.1.4 Describe and demonstrate the techniques and procedures for using body fillers and abrasives. (MVBR A10.4; AP A8.4) 10.8.1.5 Demonstrate and perform body filler application, shaping, and finishing techniques on automotive sheet metal. (MVBR A10.5; AP A8.5)			

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Goal 8: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**. *(continued)*

GLO 8.1: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**. *(continued)*

	MVBR A10 Body Fillers and Abrasives AP A8 Body Fillers and Abrasives (14 hours) *(continued)*			
	10.8.1.6 Describe and demonstrate the procedures used to remove and install/apply **adhesives**. (MVBR A8.5; AP A6.5) (Note: The portion of this SLO dealing with fasteners is in course 9030.)			

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Goal 9: Demonstrate the knowledge and skills required to select and use **fasteners**.

GLO 9.1: Demonstrate the knowledge and skills required to select and use **fasteners.**

9.9.1.1 Demonstrate the ability to identify types of fasteners and describe their applications.	10.9.1.1 →	11A.9.1.1 Describe and demonstrate the procedures used to remove and install/apply **fasteners**. (MVBR A8.5; AP A6.5) (Note: The portion of this SLO dealing with adhesives is in course 9029.)		
9.9.1.2 Demonstrate the ability to install and remove mechanical fasteners.	10.9.1.2 →			

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Goal 10: Demonstrate the knowledge and skills required to repair and replace **glass**, **upholstery**, **trim**, **hardware**, and **other components**.

GLO 10.1: Demonstrate the knowledge and skills required to repair and replace **glass**, **upholstery**, **trim**, **hardware**, and **other components**.

	10.10.1.1 Demonstrate an awareness of glass repair and replacement.	11A.10.1.1 →		
		11A.10.1.2 Demonstrate an awareness of the need to repair and replace upholstery.		
		11A.10.1.3 Demonstrate an awareness of upholstery components.		
		11A.10.1.4 Define terminology associated with trim and hardware. (MVBR A8.1; AP A6.1)		
		11A.10.1.5 Identify hazards and describe safe work practices pertaining to trim, hardware, fasteners, and adhesives. (MVBR A8.2; AP A6.2)		

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Goal 10: Demonstrate the knowledge and skills required to repair and replace **glass**, **upholstery**, **trim**, **hardware**, and **other components**. *(continued)* **GLO 10.1:** Demonstrate the knowledge and skills required to repair and replace **glass**, **upholstery**, **trim**, **hardware**, and **other components**. *(continued)*				
		11A.10.1.6 Identify and describe the types of trim, hardware, fasteners, and adhesives. (MVBR A8.3; AP A6.3) 11A.10.1.7 Describe and demonstrate the procedures used to inspect and repair trim and hardware for collision-related damage. (MVBR A8.4; AP A6.4) 11A.10.1.8 Describe and demonstrate the procedures used to remove and install pinstripes and decals. (MVBR A8.6; AP A6.6) 11A.10.1.9 Demonstrate an awareness of passenger restraint systems.		

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Goal 11: Demonstrate the knowledge and skills required for **surface preparation**. **GLO 11.1:** Demonstrate the knowledge and skills required for **surface preparation**.				
9.11.1.1 Describe ideal working conditions for surface preparation.	10.11.1.1 →	11A.11.1.1 →	11B.11.1.1 →	11C.11.1.1 →
	10.11.1.2 Identify topcoats and undercoats, and describe the procedures and considerations for evaluating their condition.	11A.11.1.2 →	11B.11.1.2 Identify and describe the methods involved in stripping topcoats, undercoats, and paint.	11C.11.1.2 Identify topcoats and undercoats, and describe the procedures and considerations for evaluating their condition.
	10.11.1.3 Identify and describe the methods involved in stripping topcoats, undercoats, and paint.	11A.11.1.3 →		11C.1.3 Identify and describe the methods involved in stripping topcoats, undercoats, and paint.

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Goal 12: Demonstrate the knowledge and skills required for **refinishing and post-refinishing**.

GLO 12.1: Demonstrate the knowledge and skills required for **refinishing and post-refinishing**.

		MVBR A14 Refinishing Equipment Preparation 1 AP A12 Refinishing Equipment Preparation 1 (14 hours)		
		11A.12.1.1 Define terminology associated with refinishing equipment preparation. (MVBR A14.1; AP A12.1) 11A.12.1.2 Identify hazards and describe safe work practices when preparing refinishing equipment. (MVBR A14.2; AP A12.2) 11A.12.1.3 Describe and demonstrate the procedures used to set up, operate, and maintain the spray booth. (MVBR A14.3; AP A12.3)		11C.12.1.1 Demonstrate the knowledge and skills required for refinishing and post-refinishing.

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Goal 12: Demonstrate the knowledge and skills required for **refinishing and post-refinishing**. *(continued)*

GLO 12.1: Demonstrate the knowledge and skills required for **refinishing and post-refinishing**. ***(continued)***

		MVBR A14 Refinishing Equipment Preparation 1 AP A12 Refinishing Equipment Preparation 1 (14 hours) ***(continued)***	
		11A.12.1.4 Describe and demonstrate the procedures used to set up, operate, and maintain the spray gun. (MVBR A14.4; AP A12.4) 11A.12.1.5 Describe and demonstrate complete paint booth and spray gun set-up and preparation procedures. (MVBR A14.5; AP A12.5)	

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Goal 13: Demonstrate the knowledge and skills required for **cleaning and detailing**. **GLO 13.1:** Demonstrate the knowledge and skills required for **cleaning and detailing**.				
9.13.1.1 Demonstrate the ability to clean vehicles in order to prepare them for repair and refinishing.	10.13.1.1 →		11B.13.1.1 Demonstrate the ability to clean parts in order to prepare them for welding.	11C.13.1.1 Demonstrate the ability to clean vehicles and parts in order to prepare them for corrosion protection.
Goal 14: Describe and demonstrate transferable **cross-curricular** knowledge and skills. **GLO 14.1:** Apply transferable **literacy** knowledge and skills to collision repair and refinishing.				
	10.14.1.1 Demonstrate the ability to read, interpret, and communicate information (including acronyms) related to collision repair and refinishing.	11A.14.1.1 →	11B.14.1.1 Demonstrate the ability to read, interpret, and communicate information (including acronyms) related to metals and welding.	11C.14.1.1 Demonstrate the ability to read, interpret, and communicate information (including acronyms) related to automotive painting.
		11A.14.1.2 Demonstrate the ability to read and interpret estimates in order to perform the correct repairs and refinishing.		

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Goal 14: Describe and demonstrate transferable **cross-curricular** knowledge and skills. ***(continued)***

GLO 14.2: Apply transferable **numeracy** knowledge and skills to collision repair and refinishing.

9.14.2.1 Demonstrate proficiency in the use of measurement tools such as tape measures and rulers.	10.14.2.1 →	11A.14.2.1 →	11B.14.2.1 →	11C.14.2.1 →
	10.14.2.2 Demonstrate proficiency in the use of fractions, decimals, percentages, and ratios.	11A.14.2.2 Demonstrate proficiency in calculating volume.		11C.14.2.2 Demonstrate the correct use of ratios and proportions in the mixing of products.
	10.14.2.3 Demonstrate the ability to convert between imperial (or standard) and metric units of measurement.			11C.14.2.3 Perform basic arithmetic. (MVBR A17.8; AP A15.6)
				11C.14.2.4 Perform basic algebra. (MVBR A17.9; AP A15.7)

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Goal 14: Describe and demonstrate transferable **cross-curricular** knowledge and skills. *(continued)*

GLO 14.3: Apply transferable **scientific** knowledge and skills to collision repair and refinishing.

11C.14.3.1 Define and explain terms associated with metallurgy and batteries.
(MVBR A17.1; AP A15.1)

11C.14.3.2 Identify hazards and describe safe work practices for working with automotive metals and batteries.
(MVBR A17.2; AP 15.2)

11C.14.3.3 Describe the effects of metalworking and heat on metallurgic properties.
(MVBR A17.3)

11C.14.3.4 Describe the properties of metals.
(MVBR A17.4)

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Goal 14: Describe and demonstrate transferable **cross-curricular** knowledge and skills. *(continued)*

GLO 14.3: Apply transferable **scientific** knowledge and skills to collision repair and refinishing. *(continued)*

				11C.14.3.5 Identify and describe types of batteries and their purpose, location, construction, operation, and ratings. (MVBR A17.5; AP A15.3) 11C.14.3.6 Describe science concepts associated with batteries and refinishing materials (paint). (AP A15.4) 11C.14.3.7 Describe differences with high voltage batteries. (MVBR A17.6) 11C.14.3.8 Describe the procedures used when working with automotive batteries. (MVBR A17.7; AP A15.5)

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Goal 15: Demonstrate an understanding of the **scope** of collision repair and refinishing, including **training and career opportunities** and **working conditions**.				
GLO 15.1: Demonstrate an understanding of the **scope** of collision repair and refinishing, and of associated occupations.				
9.15.1.1 Demonstrate an awareness of the scope of collision repair and refinishing, and of associated occupations.	10.15.1.1 →			
GLO 15.2: Demonstrate an understanding of **training and career opportunities** and **working conditions** in collision repair and refinishing, and in associated occupations.				
9.15.2.1 Demonstrate an awareness of training and career opportunities and working conditions in collision repair and refinishing, and in associated occupations.	10.15.2. →		11B.15.2.1 Demonstrate an awareness of apprenticeship, training, and career opportunities, and professional organizations related to welding and metal fabrication. 11B.15.2.2 Demonstrate an awareness of working conditions related to welding and metal fabrication.	11C.15.2.1 Demonstrate an awareness of apprenticeship, training, and career opportunities, and professional organizations related to corrosion protection. 11C.15.2.2 Demonstrate an awareness of working conditions related to corrosion protection.

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Goal 16: Demonstrate an awareness of **sustainability**.				
GLO 16.1: Describe the effects of collision repair and refinishing on **human health and well-being**, including on tradespersons working in the field and those who use their services.				
9.16.1.1 Demonstrate the ability to use dust collection systems.	10.16.1.1 →	11A.16.1.1 Demonstrate an awareness of the health effects related to exposure to airborne dust and contaminants. 11A.16.1.2 Demonstrate an awareness of the health effects related to exposure to chemicals used in the collision repair and refinishing industry.	11B.16.1.1 Demonstrate an awareness of health concerns related to welding. 11B.16.1.2 Demonstrate an awareness of the importance of dust collection systems.	
GLO 16.2: Describe collision repair and refinishing's **sustainability practices** and **impact on the environment**.				
	10.16.2.1 Demonstrate an awareness of the importance of following environmentally appropriate procedures for disposing of and recycling hazardous materials.	11A.16.2.1 Demonstrate adherence to environmentally appropriate procedures for disposing of and recycling hazardous materials.	11B.16.2.1 Demonstrate adherence to environmentally appropriate procedures for disposing of and recycling metals.	11C.16.2.1 Demonstrate adherence to environmentally appropriate procedures for disposing of and recycling hazardous materials.

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Goal 17: Demonstrate an awareness of **ethical and legal standards** as they pertain to collision repair and refinishing.				
GLO 17.1: Practise **ethical and legal standards** as they pertain to collision repair and refinishing.				
	10.17.1.1 Demonstrate an awareness of ethics.	11A.17.1.1 Demonstrate an awareness of the types of circumstances in collision repair and refinishing that require police reports.	11B.17.1.1 Demonstrate an awareness of the procedures to follow when customer's vehicles contain restricted products.	
	10.17.1.2 Demonstrate an awareness of the legal requirements for restoring vehicles to pre-accident conditions.			
Goal 18: Demonstrate the **skills for success**.				
GLO 18.1: Demonstrate fundamental **employability skills**.				
9.18.1.1 Demonstrate regular and punctual attendance.	10.18.1.1 →	11A.18.1.1 →	11B.18.1.1 →	11C.18.1.1 →
9.18.1.2 Demonstrate the ability to communicate respectfully and effectively.	10.18.1.2 →	11A.18.1.2 →	11B.18.1.2 →	11C.18.1.2 →

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Goal 18: Demonstrate the **skills for success**. *(continued)* **GLO 18.1:** Demonstrate fundamental **employability skills**. *(continued)*				
9.18.1.3 Demonstrate accountability by taking responsibility for own actions.	10.18.1.3 →	11A.18.1.3 →	11B.18.1.3 →	11C.18.1.3 →
9.18.1.4 Demonstrate adaptability, initiative, and effort.	10.18.1.4 →	11A.18.1.4 →	11B.18.1.4 →	11C.18.1.4 →
9.18.1.5 Demonstrate teamwork skills.	10.18.1.5 →	11A.18.1.5 →	11B.18.1.5 →	11C.18.1.5 →
9.18.1.6 Demonstrate the ability to stay on task and use time effectively.	10.18.1.6 →	11A.18.1.6 →	11B.18.1.6 →	11C.18.1.6 →
9.18.1.7 Demonstrate the responsible use of wireless devices.	10.18.1.7 →	11A.18.1.7 →	11B.18.1.7 →	11C.18.1.7 →

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Goal 18: Demonstrate the **skills for success**. *(continued)*				
GLO 18.2: Demonstrate an awareness of **culture and diversity** and their importance in the workplace.				
	10.18.2.1 Demonstrate an awareness of culture and diversity and their place in the workplace.	11A.18.2.1 Demonstrate an awareness of the diversity of cultures in society.	11B.18.2.1 Demonstrate an awareness of workplace culture.	11C.18.2.1 Demonstrate an awareness of the need to interact positively with people of different cultures in society and in the workplace.
GLO 18.3: Demonstrate **critical thinking skills** in analysis, diagnosis, and problem solving.				
	10.18.3.1 Demonstrate an awareness of critical thinking and problem solving.	11A.18.3.1 Demonstrate an awareness of situations in which technicians need to exercise critical thinking skills.	11B.18.3.1 Demonstrate an awareness of some of the steps required to solve problems.	11C.18.3.1 Demonstrate the ability to list the steps that were used to diagnose a problem and arrive at a logical decision.
Goal 19: Demonstrate an understanding of the **evolution** of collision repair and refinishing, including its **technological progression and emerging trends**.				
GLO 19.1: Describe the **evolution** of collision repair and refinishing, including its **technological progression and emerging trends**.				
	10.19.1.1 Demonstrate an awareness of the need for technicians to adapt to changing technologies.	11A.19.1.1 Demonstrate an awareness of the evolution of collision repair, including its technological progression and emerging trends.	11B.19.1.1 Demonstrate an awareness of the evolution of automotive metals and welding, including technological progressions and emerging trends.	11C.19.1.1 Demonstrate an awareness of the evolution of corrosion protection, including its technological progression and emerging trends.

Grade 12 Collision Repair and Refinishing

General and Specific Learning Outcomes by Goal

Grade 12 Collision Repair and Refinishing: General and Specific Learning Outcomes by Goal

9033 **Damage Analysis and Structural Repairs (12A)** 40S / 40E / 40M	9034 **Weld-On and Bolt-On Panel Replacement (12B)** 40S / 40E / 40M	9035 **Advanced Automotive Painting (12C)** 40S / 40E / 40M	9036 **Colour Theory and Career Preparation (12D)** 40S / 40E / 40M
Goal 1: Describe and apply **health and safety** practices.			
GLO 1.1: Describe and apply **health and safety** practices.			
12A.1.1.1 Describe and apply health and safety practices.	12B.1.1.1 →	12C.1.1.1 →	12D.1.1.1 →
12A.1.1.2 Create and maintain a safe and organized working environment.	12B.1.1.2 →	12C.1.1.2 →	12D.1.1.2 →
MVBR and AP **A2 Trade Safety Awareness (7 hours)** This unit is also taught in 9029 and 9032.			
12A.1.1.3 Identify safety and health requirements. (MVBR & AP A2.1)			
12A.1.1.4 Identify personal protective equipment (PPE) and procedures. (MVBR & AP A2.2)			
12A.1.1.5 Identify electrical safety. (MVBR & AP A2.3)			

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Goal 1: Describe and apply **health and safety** practices. *(continued)*

GLO 1.1: Describe and apply **health and safety** practices. *(continued)*

MVBR and AP A2 Trade Safety Awareness (7 hours) *(continued)* This unit is also taught in 9029 and 9032.			
12A.1.1.6 Identify fire safety. (MVBR & AP A2.4) 12A.1.1.7 Identify ergonomics. (MVBR & AP A2.5) 12A.1.1.8 Hazard recognition and control. (MVBR & AP A2.6) 12A.1.1.9 Hazard of confined space entry. (MVBR & AP A2.7) 12A.1.1.10 Identify first aid/ CPR. (A2.8) 12A.1.1.11 Identify the safety requirements as they apply to WHMIS. (MVBR & AP A2.9) 12A.1.1.12 Identifying and controlling hazards. (MVBR & AP A2.10)			

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Goal 2: Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**.

GLO 2.1: Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**.

12A.2.1.1 Demonstrate the knowledge and skills required to select, use, and manage tools and equipment used in damage analysis and structural repair. 12A.2.1.2 Demonstrate the knowledge and skills required to select, use, and manage tools and equipment applicable to removing and installing glass.	12B.2.1.1 Demonstrate the knowledge and skills required to select, use, and manage tools and equipment used in weld-on and bolt-on panel replacement.	12C.2.1.1 Demonstrate the knowledge and skills required to select, use, and manage tools and equipment used in surface preparation and refinishing.	12D.2.1.1 Demonstrate the knowledge and skills required to select, use, and manage tools and equipment used in colour theory.
		MVBR A15 Refinishing Materials 1 **AP A13 Refinishing Materials 1 (49 hours)** This unit is also taught in 9036.	**MVBR A15 Refinishing Materials 1** **AP A13 Refinishing Materials 1 (49 hours)** This unit is also taught in 9035.
		12C.2.1.2 Define terminology associated with refinishing materials. (MVBR A15.1; AP A13.1) 12C.2.1.3 Identify hazards and describe safe work practices when using refinishing materials. (MVBR A15.2; AP A13.2)	12D.2.1.2 Define terminology associated with refinishing materials. (MVBR A15.1; AP A13.1) 12D.2.1.3 Identify hazards and describe safe work practices when using refinishing materials. (MVBR A15.2; AP A13.2)

9033 **Damage Analysis and Structural Repairs (12A)** 40S / 40E / 40M	9034 **Weld-On and Bolt-On Panel Replacement (12B)** 40S / 40E / 40M	9035 **Advanced Automotive Painting (12C)** 40S / 40E / 40M	9036 **Colour Theory and Career Preparation (12D)** 40S / 40E / 40M

Goal 2: Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**. *(continued)*

GLO 2.1: Demonstrate the ability to select, use, and manage **tools**, **equipment**, and **materials**. *(continued)*

		MVBR A15 Refinishing Materials 1 **AP A13 Refinishing Materials 1 (49 hours)** *(continued)* This unit is also taught in 9036.	**MVBR A15 Refinishing Materials 1** **AP A13 Refinishing Materials 1 (49 hours)** *(continued)* This unit is also taught in 9035.
		12C.2.1.4 Describe and demonstrate the types of refinishing materials, and their characteristics, applications, and procedures for use. (MVBR A15.3; AP A13.3)	12D.2.1.4 Describe and demonstrate the types of refinishing materials, and their characteristics, applications, and procedures for use. (MVBR A15.3; AP A13.3)
		12C.2.1.5 Describe and demonstrate application of refinishing materials on an automotive panel. (MVBR A15.4; AP A13.4)	12D.2.1.5 Describe and demonstrate application of refinishing materials on an automotive panel. (MVBR A15.4; AP A13.4)

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Goal 3: Demonstrate the knowledge and skills required for vehicle **damage analysis** and **repair estimation**.			
GLO 3.1: Demonstrate the knowledge and skills required for vehicle **damage analysis**.			
12A.3.1.1 Demonstrate the knowledge and skills required to determine whether damaged glass should be repaired or replaced.	12B.3.1.1 Demonstrate the knowledge and skills required to access and inspect vehicles to determine the extent of damage.	12C.3.1.1 Demonstrate the knowledge and skills required to evaluate the condition of the substrate while performing repairs.	
12A.3.1.2 Demonstrate the knowledge and skills required to explain the need to inspect structural components for damage or corrosion.	12B.3.1.2 Demonstrate the knowledge and skills required to evaluate damage in order to determine whether repair or replacement is necessary.	12C.3.1.2 Demonstrate the knowledge and skills required to determine the extent of damage to paint in order to plan refinishing repairs.	
GLO 3.2: Demonstrate the knowledge and skills required for vehicle **repair estimation**.			
12A.3.2.1 Demonstrate the knowledge and skills required to estimate the time and materials required to complete repairs.	12B.3.2.1 →	12C.3.2.1 →	12D.3.2.1 →
12A.3.2.2 Demonstrate the ability to complete repair estimates.	12B.3.2.2 →	12C.3.2.2 →	12D.3.2.2 →

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Goal 4: Demonstrate the knowledge and skills required to perform **welding** procedures.			
GLO 4.1: Demonstrate the knowledge and skills required to perform **welding** procedures.			
12A.4.1.1 Demonstrate the ability to prepare surfaces for welding.	12B.4.1.1 →	12C.4.1.1 Demonstrate the ability to restore corrosion protection.	
Goal 5: Demonstrate the knowledge and skills required to perform **structural repairs**.			
GLO 5.1: Demonstrate an understanding of **vehicle construction**.			
12A.5.1.1 Demonstrate an understanding of types of vehicle construction and their characteristics.	12B.5.1.1 →		
12A.5.1.2 Demonstrate an understanding of body sections and their components.	12B.5.1.2 →		
12A.5.1.3 Demonstrate an understanding of structural and non-structural components.	12B.5.1.3 →		
12A.5.1.4 Demonstrate an understanding of the types of materials used in vehicle construction.	12B.5.1.4 →		

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Goal 5: Demonstrate the knowledge and skills required to perform **structural repairs**. *(continued)*

GLO 5.2: Demonstrate the knowledge and skills required to perform **measuring and gauging**.

12A.5.2.1 Demonstrate an understanding of point-to-point measuring tools and accessories.	12B.5.2.1 →		
12A.5.2.2 Demonstrate an understanding of the procedures for making point-to-point measurements.	12B.5.2.2 →		
12A.5.2.3 Demonstrate an understanding of the three-section principle.	12B.5.2.3 →		
12A.5.2.4 Demonstrate an understanding of *datum* and *centreline*.	12B.5.2.4 →		
12A.5.2.5 Demonstrate an understanding of three-dimensional measuring systems.	12B.5.2.5 →		

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Goal 5: Demonstrate the knowledge and skills required to perform **structural repairs**. *(continued)*

GLO 5.3: Demonstrate the knowledge and skills required to perform **structural repairs**.

12A.5.3.1 Demonstrate an understanding of the importance of vehicle structures being dimensionally correct.	12B.5.3.1 →	12C.5.3.1 Discuss the effects of corrosion on structural components.	
12A.5.3.2 Demonstrate the ability to participate in aligning vehicles to manufacturer's specifications.	12B.5.3.2 →		
12A.5.3.3 Demonstrate the ability to perform fit-up on replacement sheet metal components.	12B.5.3.3 →		

Goal 6: Demonstrate the knowledge and skills required to perform **sheet metal repairs**.

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

	MVBR A9 Metal Panels and Components 1 **AP A7 Metal Panels and Components (49 hours)**		
	12B.6.1.1 Define terminology associated with vehicle construction, automotive sheet metal, and components. (MVBR A9.1; AP A7.1)	12C.6.1.1 Demonstrate an awareness of the properties of metals used in vehicles.	12D.6.1.1 Demonstrate an awareness of the processes of oxidation and electrolysis.

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Goal 6: Demonstrate the knowledge and skills required to perform **sheet metal repairs**. *(continued)*

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

	MVBR A9 Metal Panels and Components 1 AP A7 Metal Panels and Components (49 hours) *(continued)*		
	12B.6.1.2 Identify hazards and describe safe work practices when working with automotive sheet metal and components. (MVBR A9.2; AP A7.2)	12C.6.1.2 Demonstrate an awareness of the terms associated with metallurgy.	
	12B.6.1.3 Identify and describe the types of vehicle construction, automotive sheet metal, and their characteristics. (MVBR A9.3; AP A7.3)	12C.6.1.3 Demonstrate an awareness of the effect of heat on metal.	
	12B.6.1.4 Identify and describe types of damage to sheet metal. (MVBR A9.4; AP A7.4)	12C.6.1.4 Demonstrate an awareness of high-strength steel (HSS) and its applications on vehicles.	
	12B.6.1.5 Identify considerations for performing metalwork on automotive sheet metal. (MVBR A9.5; AP A7.5)	12C.6.1.5 Demonstrate an awareness of the effects that metalworking has on metals.	

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Goal 6: Demonstrate the knowledge and skills required to perform **sheet metal repairs**. *(continued)*

GLO 6.2: Demonstrate the ability to **perform sheet metal repairs**.

	MVBR A9 Metal Panels and Components 1 AP A7 Metal Panels and Components (49 hours) *(continued)*		
	12B.6.2.1 Describe and demonstrate repair procedures on automotive sheet metal. (MVBR A9.6; AP A7.6)	12C.6.2.1 Demonstrate an awareness of the types of panels and their respective repair procedures.	12D.6.2.1 Demonstrate an awareness of the procedures to prevent or correct problems that occur when working metals.
	12B.6.2.2 Describe and demonstrate methods used to detect surface irregularities on automotive sheet metal. (MVBR A9.7; AP A7.7)	12C.6.2.2 Demonstrate the ability to determine primary and secondary damage.	
	12B.6.2.3 Describe and demonstrate procedures used to prepare automotive sheet metal for the application of fillers. (MVBR A9.8; AP A7.8)	12C.6.2.3 Demonstrate the ability to perform fabrication for rust repair patches.	
	12B.6.2.4 Describe and demonstrate procedures for correcting rust perforation. (MVBR A9.9)		

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Goal 6: Demonstrate the knowledge and skills required to perform **sheet metal repairs**. *(continued)*

GLO 6.2: Demonstrate the ability to **perform sheet metal repairs**. *(continued)*

	MVBR A9 Metal Panels and Components 1 AP A7 Metal Panels and Components (49 hours) *(continued)*	
	12B.6.2.5 Demonstrate and perform repair procedures on automotive sheet metal. (MVBR A9.10; AP A7.9)	

Goal 7: Demonstrate the knowledge and skills required to repair **plastic and composite** panels.

GLO 7.1: Demonstrate the knowledge and skills required to repair **plastic and composite** panels.

Goal 8: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**.

GLO 8.1: Demonstrate the knowledge and skills required to select and use **seam sealers**, **fillers**, and **adhesives**.

12A.8.1.1 Demonstrate the identification, selection, application, maintenance, and management of seam sealers used in structural repairs.	12B.8.1.1 →	12C.8.1.1 Demonstrate the ability to prepare the surface for the top coating of seam sealers and adhesives.
12A.8.1.2 Demonstrate the identification, selection, application, maintenance, and management of adhesives used in structural repairs.	12B.8.1.2 →	

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Goal 9: Demonstrate the knowledge and skills required to select and use **fasteners**.			
GLO 9.1: Demonstrate the knowledge and skills required to select and use **fasteners**.			
	12B.9.1.1 Describe the identification, selection, and management of fasteners used in panel replacement. 12B.9.1.2 Demonstrate the use of fasteners in panel replacement.		
Goal 10: Demonstrate the knowledge and skills required to repair and replace **glass**, **upholstery**, **trim**, **hardware**, and **other components**.			
GLO 10.1: Demonstrate the knowledge and skills required to repair and replace **glass**, **upholstery**, **trim**, **hardware**, and **other components**.			
12A.10.1.1 Demonstrate an understanding of the functioning and replacement of passenger restraint systems.			

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Goal 11: Demonstrate the knowledge and skills required for **surface preparation**.

GLO 11.1: Demonstrate the knowledge and skills required for **surface preparation**.

	MVBR A12 Surface Preparation AP A10 Surface Preparation (28 hours)	
12A.11.1.1 Demonstrate the safe and appropriate identification, selection, use, and management of weld-through coatings.	12C.11.1.1 Define terminology associated with surface preparation. (MVBR A12.1; AP A10.1)	
12A.11.1.2 Demonstrate the ability to select, use, and manage abrasives.	12C.11.1.2 Identify hazards and describe safe work practices when performing surface preparation. (MVBR A12.2; AP A10.2)	
12A.11.1.3 Demonstrate the ability to prepare surfaces for welding and other forms of structural repair.	12C.11.1.3 Describe and demonstrate products used to clean surfaces, their applications, and procedures for use. (MVBR A12.3; AP A10.3)	
	12C.11.1.4 Identify substrate types and describe the procedures and considerations for evaluating their condition. (MVBR A12.4; AP A10.4)	

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Goal 11: Demonstrate the knowledge and skills required for **surface preparation**. *(continued)*

GLO 11.1: Demonstrate the knowledge and skills required for **surface preparation**. *(continued)*

		MVBR A12 Surface Preparation AP A10 Surface Preparation (28 hours) *(continued)*	
		12C.11.1.5 Describe and demonstrate types of masking materials, their applications, and procedures for use. (MVBR A12.5; AP A10.5) 12C.11.1.6 Describe and demonstrate the types of surface preparation and their characteristics and applications. (MVBR A12.6; AP A10.6) 12C.11.1.7 Describe and demonstrate surface preparation of substrates. (MVBR A12.7; AP A10.7)	

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Goal 12: Demonstrate the knowledge and skills required for **refinishing and post-refinishing**.

GLO 12.1: Demonstrate the knowledge and skills required for **refinishing and post-refinishing**.

			MVBR A16 Post-Refinishing Functions 1 **AP A14 Post-Refinishing Functions 1 (14 hours)**
		12C.12.1.1 Demonstrate the ability to apply base coats, topcoats, and clear coat finishes.	12D.12.1.1 Define terminology associated with post-refinishing functions. (MVBR A16.1; AP A14.1)
		12C.12.1.2 Demonstrate the ability to apply single-stage finishes.	12D.12.1.2 Identify hazards and describe safe work practices when performing post-refinishing functions. (MVBR A16.2; AP A14.2)
			12D.12.1.3 Describe and demonstrate the post-refinishing functions for the exterior of the vehicle. (MVBR A16.3; AP A14.3)
			12D.12.1.4 Describe and demonstrate the post-refinishing functions for the interior of the vehicle. (MVBR A16.4; AP A14.4)

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Goal 12: Demonstrate the knowledge and skills required for **refinishing and post-refinishing**. *(continued)*

GLO 12.1: Demonstrate the knowledge and skills required for **refinishing and post-refinishing**. *(continued)*

			MVBR A16 Post-Refinishing Functions 1 **AP A14 Post-Refinishing Functions 1 (14 hours)** ***(continued)***
			12D.12.1.5 Describe and demonstrate equipment and products used in the post-refinishing of the vehicle. (MVBR A16.5; AP A14.5) 12D.12.1.6 Perform post-refinishing procedures on a vehicle. (MVBR A16.6; AP A14.6)

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Goal 13: Demonstrate the knowledge and skills required for **cleaning and detailing**.			
		GLO 13.1: Demonstrate the knowledge and skills required for **cleaning and detailing**.	
		12C.13.1.1 Demonstrate the ability to detail a vehicle's exterior.	12D.13.1.1 →
		12C.13.1.2 Demonstrate the ability to detail a vehicle's interior.	12D.13.1.2 →
		12C.13.1.3 Demonstrate the ability to correct topcoat defects.	12D.13.1.3 →
		12C.13.1.4 Demonstrate the ability to remove overspray.	12D.13.1.4 →
		12C.13.1.5 Demonstrate the ability to polish a vehicle's exterior.	12D.13.1.5 →
		12C.13.1.6 Demonstrate the ability to clean a vehicle's interior.	12D.13.1.6 →
		12C.13.1.7 Demonstrate the ability to wash vehicle exterior.	12D.13.1.7 →

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Goal 13: Demonstrate the knowledge and skills required for **cleaning and detailing**. *(continued)* **GLO 13.1:** Demonstrate the knowledge and skills required for **cleaning and detailing**. *(continued)*			
		12C.13.1.8 Demonstrate the ability to perform final cleanup for customer delivery.	12D.13.1.8 →
		12C.13.1.9 Demonstrate the ability to apply decals and	12D.13.1.9 →
Goal 14: Describe and demonstrate transferable **cross-curricular** knowledge and skills. **GLO 14.1:** Apply transferable **literacy** knowledge and skills to collision repair and refinishing.			
12A.14.1.1 Demonstrate the ability to read, interpret, and communicate information from technical service bulletins.	12B.14.1.1 →	12C.14.1.1 →	12D.14.1.1 →
12A.14.1.2 Demonstrate the ability to read, interpret, and communicate information from supplier labels.	12B.14.1.2 →	12C.14.1.2 →	12D.14.1.2 →
MVBR A6 Trade Related Documents 1 **AP A4 Trade Related Documents (7 hours)**			**MVBR A7 Communication** **AP A5 Communication** **(7 hours)**
12A.14.1.3 Identify sources of related information. (MVBR A6.1; AP A4.1)			12D.14.1.3 Describe the importance of effective communication practices. (MVBR A7.1; AP A5.1)

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Goal 14: Describe and demonstrate transferable **cross-curricular** knowledge and skills. *(continued)*

GLO 14.1: Apply transferable **literacy** knowledge and skills to collision repair and refinishing. *(continued)*

MVBR A6 Trade Related Documents 1 AP A4 Trade Related Documents (7 hours) *(continued)*	**MVBR A7 Communication AP A5 Communication (7 hours) *(continued)***
12A.14.1.4 Identify and interpret information found on the vehicle. (MVBR A6.2; AP A4.2)	12D.14.1.4 Identify the types of communication equipment and describe their operating procedures. (MVBR A7.2; AP A5.2)
12A.14.1.5 Identify types of documents and describe the procedures used to interpret them. (MVBR A6.3; AP A4.3)	12D.14.1.5 Role-play how to deal with challenging situations; practise empathetic listening and response. (MVBR A7.3; AP A5.3)
12A.14.1.6 Describe the procedures used to prepare documentation. (MVBR A6.4; AP A4.4)	12D.14.1.6 Practise listening skills with customers. (MVBR A7.4; AP A5.4)
12A.14.1.7 Describe procedures for ordering parts and materials. (MVBR A6.5)	12D.14.1.7 Perform resumé writing; practise selling yourself. (MVBR A7.5; AP A5.5)

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Goal 14: Describe and demonstrate transferable **cross-curricular** knowledge and skills. *(continued)*

GLO 14.1: Apply transferable **literacy** knowledge and skills to collision repair and refinishing. *(continued)*

MVBR A6 Trade Related Documents 1 AP A4 Trade Related Documents (7 hours) *(continued)*		**MVBR A7 Communication AP A5 Communication (7 hours) *(continued)***
12A.14.1.8 Describe procedures for ordering refinishing materials and related supplies. (AP A4.5)		12D.14.1.8 Demonstrate an understanding of the business operation of a collision repair and refinishing facility.
12A.14.1.9 Describe procedures for organizing/storing parts and materials. (MVBR A6.6)		12D.14.1.9 Demonstrate the knowledge and skills required to complete repair estimates.
12A.14.1.10 Describe procedures for organizing/ storing refinishing materials and related supplies. (AP A4.6)		
12A.14.1.11 Retrieve VIN and all other necessary information as specified by the instructor for a specific job. (MVBR A6.7; AP A4.7)		
12A.14.1.12 Retrieve trade-related documents from the computer. (MVBR A6.8; AP A4.8)		

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Goal 14: Describe and demonstrate transferable **cross-curricular** knowledge and skills. *(continued)*			
GLO 14.2: Apply transferable **numeracy** knowledge and skills to collision repair and refinishing.			
12A.14.2.1 Demonstrate the mathematical skills required to complete and calculate vehicle repair estimates.	12B.14.2.1 →	12C.14.2.1 →	12D.14.2.1 →
		12C.14.2.2 Demonstrate the correct use of ratios and proportions in the mixing of products.	12D.14.2.2 →
GLO 14.3: Apply transferable **scientific** knowledge and skills to collision repair and refinishing.			
12A.14.3.1 Demonstrate an awareness of the effects of heat on metal.	12B.14.3.1 →	12C.14.3.1 Demonstrate an awareness of the chemistry associated with refinishing products.	12D.14.3.1 →
12A.14.3.2 Demonstrate an awareness of the effects of overcatalyzing fillers.	12B.14.3.2 →	12C.14.3.2 Demonstrate an awareness of the effects of overcatalyzing finishes.	12D.14.3.2 →

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Goal 15: Demonstrate an understanding of the **scope** of collision repair and refinishing, including **training and career opportunities** and **working conditions**.

GLO 15.1: Demonstrate an understanding of the **scope** of collision repair and refinishing, and of associated occupations.

			MVBR and AP A1 Learning about Work (7 hours)
12A.15.1.1 Describe the structure and scope of the motor vehicle body repairer (metal and paint) and automotive painter trades. (MVBR & AP A1.1)	12B.15.1.1 →	12C.15.1.1 →	12D.15.1.1 → 12D.15.1.2 Describe two levels of workplace competency. (MVBR & AP A1.2) 12D.15.1.3 Describe accommodation for apprentices with disabilities. (MVBR & AP A1.3)

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Goal 15: Demonstrate an understanding of the **scope** of collision repair and refinishing, including **training and career opportunities** and **working conditions**. ***(continued)***			
GLO 15.2: Demonstrate an understanding of **training and career opportunities** and **working conditions** in collision repair and refinishing, and in associated occupations.			
12A.15.2.1 Demonstrate an understanding of training and career opportunities in collision repair and refinishing.		12C.15.2.1 Demonstrate an understanding of apprenticeship, education, and career opportunities, and of professional organizations related to refinishing.	12D.15.2.1 Demonstrate the knowledge and skills required to create a portfolio, resumé, and cover letter to be used to find employment in collision repair and refinishing, and in associated fields.
12A.15.2.2 Demonstrate an understanding of apprenticeship, education, and career opportunities, and of professional organizations related to estimating.		12C.15.2.2 Demonstrate an understanding of working conditions related to refinishing.	12D.15.2.2 Demonstrate an understanding of wages and salaries for collision repair and refinishing technicians.
12A.15.2.3 Demonstrate an understanding of working conditions related to estimating.			12D.15.2.3 Demonstrate an understanding of career opportunities related to collision repair and refinishing. 12D.15.2.4 Demonstrate the ability to participate in a trade-related competition. 12D.15.2.5 Demonstrate an awareness of the need for lifelong learning in collision repair and refinishing.

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Goal 16: Demonstrate an awareness of **sustainability**.			
GLO 16.1: Describe the effects of collision repair and refinishing on **human health and well-being**, including on tradespersons working in the field and those who use their services.			
12A.16.1.1 Demonstrate an awareness of long-term health concerns related to welding.	12B.16.1.1 →	12C.16.1.1 Demonstrate an awareness of long-term health concerns related to surface preparation and refinishing.	12D.16.1.1 →
12A.16.1.2 Demonstrate the knowledge and skills required to use dust collection systems.	12B.16.1.2 →	12C.16.1.2 →	12D.16.1.2 →
GLO 16.2: Describe collision repair and refinishing's **sustainability practices** and **impact on the environment**.			
12A.16.2.1 Demonstrate appropriate recycling practices.	12B.16.2.1 →	12C.16.2.1 →	12D.16.2.1 →
		12C.16.2.2 Discuss the effects of VOCs (volatile organic compounds) on the environment.	12D.16.2.2 →
GLO 16.3: Describe **sustainable business practices** within collision repair and refinishing.			
12A.16.3.1 Demonstrate an awareness of the importance of staying current with industry trends.	12B.16.3.1 Demonstrate an awareness of the importance of staying in touch with the needs of the clientele.	12C.16.3.1 Demonstrate an awareness of practices that will keep a collision repair and refinishing facility competitive.	

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Goal 17: Demonstrate an awareness of **ethical and legal standards** as they pertain to collision repair and refinishing.			
GLO 17.1: Practise **ethical and legal standard**s as they pertain to collision repair and refinishing.			
12A.17.1.1 Discuss the characteristics of quality repairs, including following manufacturer's specifications.		12C.17.1.1 Demonstrate an awareness of the legislation related to VOCs (volatile organic compounds).	
12A.17.1.2 Demonstrate an awareness of the liability associated with substandard repairs.			
Goal 18: Demonstrate the **skills for success**.			
GLO 18.1: Demonstrate fundamental **employability skills**.			
12A.18.1.1 Demonstrate regular and punctual attendance.	12B.18.1.1 →	12C.18.1.1 →	12D.18.1.1 →
12A.18.1.2 Demonstrate the ability to communicate respectfully and effectively.	12B.18.1.2 →	12C.18.1.2 →	12D.18.1.2 →
12A.18.1.3 Demonstrate accountability by taking responsibility for own actions.	12B.18.1.3 →	12C.18.1.3 →	12D.18.1.3 →
12A.18.1.4 Demonstrate adaptability, initiative, and effort.	12B.18.1.4 →	12C.18.1.4 →	12D.18.1.4 →

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Goal 18: Demonstrate the **skills for success**. *(continued)*			
GLO 18.1: Demonstrate fundamental **employability skills**. *(continued)*			
12A.18.1.5 Demonstrate teamwork skills.	12B.18.1.5 →	12C.18.1.5 →	12D.18.1.5 →
12A.18.1.6 Demonstrate the ability to stay on task and use time effectively.	12B.18.1.6 →	12C.18.1.6 →	12D.18.1.6 →
12A.18.1.7 Demonstrate the responsible use of wireless devices.	12B.18.1.7 →	12C.18.1.7 →	12D.18.1.7 →
GLO 18.2: Demonstrate an awareness of **culture and diversity** and their importance in the workplace.			
12A.18.2.1 Demonstrate an awareness of the principles of cultural proficiency.	12B.18.2.1 Demonstrate an awareness of the need for diversity and cultural proficiency in the workplace.	12C.18.2.1 Demonstrate an awareness of cultural proficiency, which is the ability to interact positively with people of various cultures.	12D.18.2.1 Demonstrate an awareness of some of the culture-related issues and/or diversity-related issues in collision repair and refinishing, or in a typical workplace.
GLO 18.3: Demonstrate **critical thinking skills** in analysis, diagnosis, and problem solving.			
12A.18.3.1 Demonstrate the ability to solve problems by focusing only on the facts, not allowing any biases to interfere with that process.	12B.18.3.1 Demonstrate an awareness of some of the types of complex problems that require critical thinking (e.g., diagnosing complex issues).	12C.18.3.1 Demonstrate an understanding of some of the steps required to solve complex problems in collision repair and refinishing.	12D.18.3.1 Demonstrate the ability to solve complex problems that require assistance from others, additional resources, and several steps.

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Goal 19: Demonstrate an understanding of the **evolution** of collision repair and refinishing, including its **technological progression and emerging trends**. **GLO 19.1:** Describe the **evolution** of collision repair and refinishing, including its **technological progression and emerging trends**.			
12A.19.1.1 Demonstrate an awareness of the evolution of damage analysis and structural repair, including technological progression and emerging trends.	12B.19.1.1 Demonstrate an awareness of the evolution of panel replacement, including its technological progression and emerging trends.	12C.19.1.1 Demonstrate an awareness of the evolution of surface preparation and refinishing, including technological progression and emerging trends.	12D.19.1.1 Demonstrate an awareness of the evolution of colour theory, including its technological progression and emerging trends.

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