



8377

EXPLORATION OF WELDING
TECHNOLOGY (9)

15S/15E/15M

10S/10E/10M

A Welding Technology Course

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Course Description

This is an optional course intended for students wishing to explore welding technology. The emphasis is on hands-on introductory welding activities.

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

GLO 1.1: Demonstrate adherence to **safe practices** and **procedures**.

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| SLO 9.1.1.1 | Demonstrate adherence to safe practices and procedures for facilities, processes, tools, and equipment. |
| SLO 9.1.1.2 | Identify safety and health requirements. (A1.1) |
| SLO 9.1.1.3 | Identify personal protective equipment (PPE) and PPE procedures. (A1.2) |
| SLO 9.1.1.4 | Identify electrical safety. (A1.3) |
| SLO 9.1.1.5 | Identify fire safety. (A1.4) |
| SLO 9.1.1.6 | Identify ergonomics. (A1.5) |
| SLO 9.1.1.7 | Identify hazard recognition and control. (A1.6) |
| SLO 9.1.1.8 | Identify safety requirements as they apply to WHMIS. (A1.9) |
| SLO 9.1.1.9 | Describe the identification and control of specified hazards. (A1.10) |
| SLO 9.1.1.10 | Identify hazards and describe safe work practices pertaining to welding. (D1A.3) |
| SLO 9.1.1.11 | Read, interpret, and communicate safety information (e.g., MSDS sheets, etc.). |
| SLO 9.1.1.12 | Safely store and handle compressed gas tanks. |
| SLO 9.1.1.13 | Demonstrate an awareness of hazards related to compressed gas. |
| SLO 9.1.1.14 | Demonstrate the safe use of compressed air. |
| SLO 9.1.1.15 | Demonstrate an understanding of and adherence to <i>Safe Work Procedures/Job Hazards Analysis</i> documents for each piece of equipment used. |
| SLO 9.1.1.16 | Demonstrate the safe use of a plasma arc cutter. |
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GLO 1.2: Demonstrate knowledge of the *Trade Safety Awareness Curriculum for Level 1 Apprentices*.

No applicable SLOs.

Goal 2: Demonstrate an understanding of **metallurgy**.

GLO 2.1: Demonstrate an understanding of **metallurgy** as it applies to welding.

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| SLO 9.2.1.1 | Demonstrate an understanding of metallurgy as it applies to welding. |
| SLO 9.2.1.2 | Select appropriate filler materials to suit base metal. |
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Goal 3: Demonstrate the **identification, operation, maintenance, and storage** of **equipment, materials, and consumable items**.

GLO 3.1: Demonstrate the **identification** and **operation** of equipment, materials, and consumable items.

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| SLO 9.3.1.1 | Demonstrate the operation and handling of equipment, tools, materials, products, and consumable items. |
| SLO 9.3.1.2 | Identify types of hand tools, and describe their applications and procedures for use. (A3.2) |
| SLO 9.3.1.3 | Identify types of power tools, and describe their applications and procedures for use. (A3.4) |
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GLO 3.2: Demonstrate the safe and appropriate **maintenance** and **storage** of equipment, materials, and consumable items.

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| SLO 9.3.2.1 | Practise the appropriate cleaning maintenance, and storage of welding equipment, tools, materials, products, and consumable items. |
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GLO 3.3: Demonstrate an awareness of **hoisting, lifting, and rigging** procedures.

No applicable SLOs.

GLO 3.4: Demonstrate an awareness of **access equipment**.

No applicable SLOs.

Goal 4: Demonstrate an understanding of **welding processes** and exhibit competence in those processes.

GLO 4.1: Demonstrate **pre-welding** procedures.

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| SLO 9.4.1.1 | Identify GMAW welding processes, and describe their characteristics and applications. |
| SLO 9.4.1.2 | Prepare material and equipment for welding. |
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GLO 4.2: Demonstrate **ability to weld**.

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| SLO 9.4.2.1 | Perform the procedures and techniques used to deposit a weld bead using GMAW welding equipment. (D6.9) |
| SLO 9.4.2.2 | Identify hazards and describe safe work practices pertaining to oxy-fuel cutting, gouging, and welding. (C3.2) |
| SLO 9.4.2.3 | Identify oxy-fuel equipment and accessories, and describe their applications and limitations. (C3.4) |
| SLO 9.4.2.4 | Set up, operate, and shut down oxy-fuel equipment. (C3.13) |
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GLO 4.3: Perform **post-welding** procedures.

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| SLO 9.4.3.1 | Perform cleaning procedures (i.e., chipping, grinding). |
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GLO 4.4: **Inspect** and **troubleshoot** welding projects.

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| SLO 9.4.4.1 | Demonstrate an awareness of weld defects. |
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GLO 4.5: Perform **cutting** and **gouging**.

No applicable SLOs.

GLO 4.6: Perform the **Manitoba Welder Practical Examinations**.

No applicable SLOs.

Goal 5: Demonstrate an understanding of **metal design and fabrication**.

GLO 5.1: **Design** metal projects.

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| SLO 9.5.1.1 | Demonstrate an awareness of design in welding. |
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GLO 5.2: **Fabricate** metal projects.

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| SLO 9.5.2.1 | Cut material for an introductory project following broad measurements, angles, etc. |
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SLO 9.5.2.2	Perform basic material preparation and fit-up.
SLO 9.5.2.3	Tack material.

Goal 6: Describe and apply the transferable **cross-curricular** knowledge and skills.

GLO 6.1: Apply knowledge and skills from the **language arts**.

SLO 9.6.1.1	Define terminology associated with GMAW welding. (D6.1)
SLO 9.6.1.2	Define terminology associated with oxy-fuel cutting, gouging, and welding. (C3.1)

GLO 6.2: Demonstrate the **mathematics** skills related to welding.

SLO 9.6.2.1	Demonstrate an understanding of basic measurement skills.
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GLO 6.3: Demonstrate knowledge of **other subject areas**.

No applicable SLOs.

Goal 7: Follow the **ethical** and **legal standards** that pertain to the welding industry.

GLO 7.1: Demonstrate an awareness of the **ethical** and **legal expectations** of welders.

No applicable SLOs.

Goal 8: Demonstrate **employability skills**.

GLO 8.1: Demonstrate **employability skills**.

SLO 9.8.1.1	Demonstrate problem-solving skills.
SLO 9.8.1.2	Demonstrate regular attendance and punctuality.
SLO 9.8.1.3	Demonstrate accountability for their actions.
SLO 9.8.1.4	Demonstrate adaptability and effort.
SLO 9.8.1.5	Demonstrate the ability to accept and follow direction and feedback.
SLO 9.8.1.6	Demonstrate teamwork skills.
SLO 9.8.1.7	Demonstrate the ability to stay on task and effectively use time.
SLO 9.8.1.8	Describe effective verbal and non-verbal communication. (A1.a1)

Goal 9: Demonstrate an awareness of **sustainability** as it pertains to the welding industry.

GLO 9.1: Describe the impact of **human sustainability** on the health and well-being of welders.

SLO 9.9.1.1 Demonstrate an understanding of sustainability as it relates to human health and well-being.

GLO 9.2: Describe the welding industry's **sustainability practices** and impact on the environment.

SLO 9.9.2.1 Identify the welding industry's sustainability practices and impact on the environment.

GLO 9.3: Describe the **sustainable business practices** within the welding industry.

SLO 9.9.3.1 Identify industries where welding is used.

Goal 10: Demonstrate an understanding of the **structure** and **scope** of welding.

GLO 10.1: Describe the **scope** of welding.

No applicable SLOs.

GLO 10.2: Describe **apprenticeship, post-secondary, and employment opportunities**.

No applicable SLOs.

Goal 11: Demonstrate an understanding of the **evolution, technological progression, and emerging trends** in welding.

GLO 11.1: Demonstrate an understanding of the **evolution, technological progression, and emerging trends** in welding.

SLO 9.11.1.1 Demonstrate an awareness of the evolution of welding, including its technological progression and emerging trends.
