

Grade 10 Introduction to Welding Technology (20S)

Course Code: 8378

Credit: 1.0 Credit

Program: Senior Years Technology Education Program (SYTEP)

School: Swan Valley Regional Secondary School

Program Cluster: Welding Technology

Course Length: Approximately 110 instructional hours (one semester)

Instructor: Mr. Jeremy Hicks

Course Description

Introduction to Welding Technology (20S) provides students with a broad foundation in the welding trade through classroom instruction, demonstrations, skill development, and supervised shop work.

Students develop safe work habits while learning to use common hand tools, power tools, welding equipment, materials, and consumables. They complete introductory activities using GMAW (MIG), SMAW (ARC), and oxy-acetylene equipment and apply basic measuring, layout, thermal cutting, fitting, and inspection skills.

Instruction reflects the Manitoba Grade 10 welding curriculum and selected Apprenticeship Manitoba Level 1 technical-training outcomes.

Course Goals

Upon successful completion of this course, students will:

- Apply Manitoba workplace safety requirements, shop rules, WHMIS, and safe work procedures.
- Select, inspect, and properly use required personal protective equipment (PPE).
- Safely use common welding tools, equipment, materials, and consumables.
- Apply metric and imperial measurement, basic shop mathematics, and layout skills.
- Set up and perform introductory GMAW, SMAW, and oxy-acetylene activities.
- Perform basic thermal cutting, joint preparation, fitting, and finishing operations.
- Identify common weld discontinuities and evaluate basic workmanship.
- Demonstrate communication, teamwork, responsibility, and workplace professionalism.

Course Content

Shop Orientation, Trade Safety and WHMIS (16 Hours)

Students review shop rules, workers' rights and responsibilities, PPE, WHMIS, hazard recognition, the hierarchy of controls, safe work procedures, fire prevention, injury response, lockout awareness, ventilation, and housekeeping. Safety is assessed and reinforced throughout the course.

Career Education and Workplace Communication (6 Hours)

Students examine the structure of the welding trade, apprenticeship and Red Seal pathways, workplace expectations, respectful communication, active listening, trade documents, and employability skills.

Trade Mathematics, Measuring and Layout (8 Hours)

Students use metric and imperial measurements, fractions, decimals, conversions, basic geometry, and shop calculations to prepare simple layouts and cut lists.

Tools, Equipment, Materials and Consumables (10 Hours)

Students identify, inspect, maintain, and safely operate common hand tools, portable power tools, grinders, drill presses, welding machines, gas cylinders, and material-handling equipment. They compare common metals and welding consumables.

Thermal Cutting and Material Preparation (10 Hours)

Students set up oxy-fuel cutting equipment, select and adjust flames, make basic straight cuts, and prepare edges and surfaces for welding while following cylinder and fire-safety procedures.

Introductory Oxy-Acetylene Procedures (10 Hours)

Students identify equipment components, safely light and shut down a torch, adjust flames, heat materials, and complete introductory fusion-welding or brazing activities as appropriate.

Introductory GMAW (MIG) Procedures (18 Hours)

Students set up GMAW equipment, select basic parameters, establish an arc, run stringer beads, and complete introductory flat-position fillet welds while recognizing common causes of poor weld quality.

Introductory SMAW (ARC) Procedures (18 Hours)

Students set up SMAW equipment, select current and polarity, identify common electrodes, strike and maintain an arc, run stringer beads, and complete introductory flat-position fillet welds.

Fabrication, Quality Inspection and Assessment (14 Hours)

Students plan and complete a basic fabrication project using measuring, cutting, fitting, tack welding, welding, grinding, and finishing skills. Work is visually inspected for dimensions, weld profile, discontinuities, and overall craftsmanship.

Assessment

Student achievement will be evaluated using the following categories:

- **Classwork:** 20%
- **Practical Skill Demonstrations:** 30%
- **Tests and Quizzes:** 30%
- **Projects:** 20%

Assessment emphasizes both theoretical knowledge and practical skill development. Students are expected to demonstrate safe work habits, active participation, improving technical skill, and quality workmanship throughout the course.

Required Personal Protective Equipment

Students are required to wear appropriate PPE during all shop activities. If a student does not have the following PPE, it will be provided to them.

- CSA-approved steel-toe boots or toe caps
- Safety glasses
- Hearing protection
- Welding gloves
- Appropriate protective clothing and welding helmet as required

Students who do not wear the required PPE may not be permitted to participate in shop activities.

Student Expectations

Students are expected to:

- Attend class regularly and arrive on time.
- Follow all shop safety rules, safe work procedures, and teacher instructions.
- Wear required PPE before entering the shop.
- Respect classmates, instructors, equipment, materials, and facilities.
- Maintain a clean and organized work area.
- Participate fully in classroom and shop activities.
- Demonstrate responsibility, teamwork, communication, and professionalism.
- Complete assignments, weld samples, tests, and projects to the best of their ability.

Unsafe behavior may result in removal from shop activities until safety expectations have been met.

Cell Phone Policy

To maintain a safe and focused learning environment, students are required to place their cell phones in the classroom phone lockbox at the beginning of each class. Phones will remain securely stored for the duration of the class and will be returned at the end of the class period.

Students do not require personal cell phones during Welding Technology. School-issued laptops and classroom resources will be provided for online learning, research, quizzes, drawings, documentation, or other educational tasks.

This policy minimizes distractions, promotes engagement, and supports a safe working environment in the welding shop.

Curriculum Alignment

This course addresses learning outcomes from the updated Manitoba Grade 10 Introduction to Welding Technology curriculum and is aligned with selected Apprenticeship Manitoba Level 1 technical-training outcomes.

Primary Apprenticeship Manitoba units addressed include:

- A1 Learning About Work
- A2 Trade Safety Awareness
- A3 Tools and Equipment
- A4 Trade-Related Communications
- A8 Weld Process and Quality Inspection I
- A9 Thermal Cutting and Gouging

Supporting outcomes related to trade safety, career education, trade communication, trade mathematics, tools and equipment, materials and consumables, and workplace professionalism are integrated throughout the course.