

Welder Level 3

Welder

Unit: C1 Weld Process and Quality Inspection III

Level: Three

Duration: 21 hours

Theory: 14 hours

Practical: 7 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of weld process and quality inspection. Beginning with terminology and safe work practices, the unit will review welding consumables and gas cylinders and fundamental procedures for welding equipment start-up and shut down. The unit will also review marking welds, materials and parts and apply advanced applications. Apprentices will demonstrate the procedures for controlling temperature of weldments as well as finishing the final product. Finally, apprentices will describe and demonstrate the procedures for quality inspection and repair.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Review terminology associated with weld process and quality inspection.	5%
a. Refer to Welder Red Seal Occupational Standard (RSOS)	
2. Review hazards and describe safe work practices with weld process and quality inspection.	5%
3. Interpret information pertaining to weld process and quality inspection found on drawings, codes, manufacturers' specifications and jurisdictional regulations.	5%
4. Review and describe welding consumables and gas cylinders.	10%
a. Welding consumables	
• Electrodes	
• Welding wires	
• Welding fluxes	
b. Storage requirements for welding consumables	
• Electrode and flux ovens (portable and stationary)	
• Desired temperature	
• Environmentally controlled area	
• Safety data sheets (SDS)	
c. Damaged consumable products	
• Damaged electrodes	
• Torn bags of flux	
• Unidentified welding consumables	
• Identified and removed from service	
d. Gas cylinder product type and identification	
• Fuel	

- Oxygen
 - Inert
 - Active
 - e. Storage and transport requirements for gas cylinders
 - Oxygen kept separate from fuels
 - Ventilation
 - Kept in vertical position
 - Secured with chains
 - Regulatory requirements
 - Damaged gas cylinders removed from service
- 5. Review and describe the fundamental procedures for welding equipment start-up and shut down. 10%**
- a. Welding process
 - Shielded metal arc welding (SMAW)
 - Flux cored arc welding (FCAW)
 - Metal cored arc welding (MCAW)
 - Gas metal arc welding (GMAW)
 - Gas tungsten arc welding (GTAW)
 - Submerged arc welding (SAW)
 - b. Power source
 - Voltage and amperage requirements
 - Polarity
 - Stationary or portable
 - Project and power availability
 - Environmental conditions
 - c. Process selection
 - Job requirements and specifications
 - Material type, grade and thickness
 - Drawings
 - WPS/WPDS
 - d. Equipment start-up and shut down
 - Identify damaged equipment and remove from service
 - Verify electrical, gas and air supplies are connected properly
 - Start-up equipment
 - Shut down equipment
- 6. Review and describe marking welds, materials and parts. 5%**
- a. Reasons for marking material and parts
 - Traceability
 - Identification for fabrication and erection
 - b. Regulatory requirements for marking welds
 - Codes
 - Standards
 - Regulations
 - c. Transfer markings from stock material to cut parts for traceability
 - d. Advanced applications
- 7. Describe and demonstrate the procedures for controlling temperature of weldments. 20%**
- a. Heat treatments
 - Annealing
 - Tempering

- Normalizing
- Hardening
- b. Heat treatment methods
 - Ovens
 - Heating coils
 - Insulation
- c. Heat effects
 - Expansion
 - Contraction
 - Distortion
 - Mechanical properties
- d. Cooling processes
 - Quenching
 - Controlled cooling
- e. Hardness scales
 - Rockwell
 - Brinell
 - Vickers

8. Describe and demonstrate the procedures to finish final product.

20%

- a. Select and use tools and equipment
 - Grinders
 - Wire wheels
 - Buffers
- b. Identify finishes and weld profile
 - Drawings and job specifications
- c. Repair and finish weld discontinuities
 - Porosity
 - Undercut
 - Cold lap
 - Excess or incomplete penetration
- d. Repair and finish surface imperfections
 - Welding spatter
 - Gouges
 - Stray arc strikes
 - Sharp edges
 - Plate clamp gouges
 - Miscellaneous defects
- e. Prepare weldments and other pieces
- f. Chemically clean weldments
 - Oils
 - Oxides
- g. Prepare weldments for galvanizing
 - Air bleeds and drain holes
- h. Label parts for traceability
- i. Sort assemblies for specific finishes
 - Coatings
 - Pickling
 - Machining
 - Blasting

9. Describe and demonstrate the procedures for quality inspection and repair.

20%

- a. Tool and equipment use
 - Measurements to be verified
- b. Non-destructive testing methods
 - Radiography
 - Ultrasonic
 - Liquid penetrant
 - Magnetic particle examination
 - Hydro
 - Phased array
- c. Destructive testing methods
 - Bend and tensile strength
 - Etching
 - Impact
 - Hardness
- d. Repair surface imperfection and material defects
 - Surface irregularities
 - Laminations
 - Surface contamination
- e. Fabrication mitigation and repair methods
 - Improper fit-up
 - Misalignment
 - Distortion
 - Incorrect dimensions and orientation
- f. Weld discontinuities mitigation and repair methods
 - Porosity
 - Undercut
 - Cold lap
 - Excess or incomplete penetration

Welder

Unit: C2 Shielded Metal Arc Welding III

Level: Three

Duration: 63 hours

Theory: 21 hours

Practical: 42 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of shielded metal arc welding (SMAW). Beginning with terminology, hazards and safe work practices, the unit covers pipe types, materials and testing procedures. The unit also covers equipment set up but will focus on SMAW procedures for vertical (3G), overhead (4G) and pipe (2G/5G) applications. Finally, apprentices will perform the procedures for SMAW.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Define terminology associated with shielded metal arc welding (SMAW).	5%
a. Welder Red Seal Occupational Standard (RSOS)	
2. Identify hazards and describe safe work practices of SMAW.	5%
a. Fumes, electrical shocks, burns and flying debris	
b. Visible light rays, ultraviolet (UV) and infrared light	
c. Falling objects, falling hazards and fire hazards	
d. Setting equipment operating parameters	
3. Interpret codes, standards, regulations and apply welding symbols and information pertaining to SMAW.	5%
4. Review SMAW welds.	5%
a. Weld types	
b. Weld positions	
c. Joint configurations	
5. Review SMAW welding equipment, consumables and their characteristics, applications and operation.	5%
a. Equipment	
b. Components	
c. Power sources	
d. Base metals	
e. Electrodes / welding rods	
6. Identify and describe welding pipe using SMAW and its characteristics and applications and testing procedures.	20%
a. Pipe types	

- Sizing
 - Positions
 - Pipe schedule
 - b. Materials
 - Mild steel
 - Stainless steel
 - Aluminum
 - Other
 - c. Testing procedures
 - Destructive
 - Non-destructive
- 7. Describe and demonstrate procedures to set up SMAW equipment for vertical (3G), overhead (4G) and pipe (2G/5G) applications. 10%**
- a. Determine parameters
 - WPS/WPDS and application
 - b. Select machine settings
 - Polarity
 - c. Adjust amperage
 - Base metal thickness
 - Electrode type and size
 - d. Connect electrode holders and work lead clamps
 - e. Attach work lead clamp to base metal
 - f. Verify set up
 - Weld test piece of same base metal, electrode and position
- 8. Describe and demonstrate the procedures for SMAW for vertical (3G), overhead (4G) and pipe (2G/5G) applications. 15%**
- a. Equipment maintenance
 - b. Electrode manipulation techniques
 - Whip
 - Backhand and forehand
 - Weave
 - Stringer
 - c. Electrode
 - Angle
 - Inclination
 - d. Travel speed
 - e. Weld assembly
 - Prepare land
 - Set gap
 - Alignment
 - Hi-low
 - f. Maintain travel speed, electrode angle and heat inputs
 - g. Repair weld discontinuities and defects
- 9. Perform the procedures for SMAW. 30%**
- a. Groove weld assembly
 - Mild steel
 - 3G
 - 4G
 - E-4310 (E-6010) root
 - E-4918 (E-7018) hotpass, fill and cap

- b. Groove fillet weld assembly
 - Mild steel
 - 3GF
 - 4GF
 - E-4918 (E-7018)
- c. Pipe weld assembly
 - Mild steel
 - 2G-5G
 - E-4310 (E-6010) root
 - E-4918 (E-7018) hotpass, fill and cap

Welder

Unit: C3 Semi-Automatic Wire Feed Welding III

Level: Three

Duration: 63 hours

Theory: 21 hours

Practical: 42 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of semi-automatic wire feed welding. Beginning with terminology, hazards and safe work practices, the unit will review equipment, components, shielding and consumables for FCAW, MCAW, GMAW and their characteristics and applications and operation. The unit also covers welding procedures for FCAW, MCAW and GMAW processes for vertical (3G), overhead (4G) and pipe (2G/5G) applications. Finally, apprentices will perform the procedures for semi-automatic welding.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
1. Review terminology associated with automatic wire feed welding processes.	5%
a. Refer to Welder Red Seal Occupational Standard (RSOS)	
b. Flux core arc welding (FCAW)	
c. Metal core arc welding (MCAW)	
d. Gas metal arc welding (GMAW)	
2. Identify hazards and describe safe work practices of automatic wire feed welding.	5%
a. Burns, electrical burns and electrical shocks	
b. UV and infrared light and visible light rays	
c. Asphyxiation, ozone and phosgene gases	
d. Pinch points, falling objects and moving parts	
3. Interpret jurisdictional codes and regulations pertaining to automatic wire feed welding.	5%
4. Review equipment, components, shielding and consumables for FCAW, MCAW, GMAW and their characteristics and applications and operation.	25%
a. Power source	
• Constant voltage (CV) capable machines	
• Inverters	
• Rectifiers	
• Generator	
• Voltage sensing wire feeder	
b. Digital technology	
• Waveform programming	
• Real-time monitoring	
• Pre-sets	

- c. Components
 - Air-cooled guns
 - Water-cooled guns
 - Nozzles
 - Contact tips
 - Wire feeders
 - Drive rolls
 - Gas diffusers
 - Liners
 - Work lead clamps
 - Regulators/flow meters
 - Shielding gas lines
- d. Shielding gas
 - Mixed gases
 - CO₂
 - Argon
 - Helium
- e. Wire type
 - Solid
 - Tubular wire
 - Self-shielded
- f. Mode of transfer
 - Short circuit
 - Globular
 - Spray
 - Pulse spray
- g. Wire manipulation techniques
 - Backhand and forehand techniques
 - Bead width and shape (weave and stringer) to direct heat
 - Control penetration and build-up
- h. Tacking
 - Penetrating
 - Bridge
- i. Welding factors
 - Base metal
 - Joint configuration
 - Position
 - Heat input
 - WPS/WPDS

6. Describe and demonstrate welding procedures for FCAW, MCAW and GMAW processes for vertical (3G), overhead (4G) and pipe (2G/5G) applications. 25%

- a. FCAW, MCAW and GMAW equipment and components
 - Identify damage and defects
 - Required maintenance
- b. Performs welds
 - Start-up equipment
 - Start arc and manipulate electrode
 - Perform wire manipulation techniques
 - Perform tacking, backstepping and sequencing techniques
 - Adjust travel speed and angle
 - Stop arc

- Remove slag using tools
- Identify weld discontinuities and defects
- Determine cause of weld discontinuities and defects
- Repair weld discontinuities and defects
- Re-start arc
- Finish weld
- Shut down equipment

7. Perform the procedures for semi-automatic welding.

35%

- a. Flux core arc welding (FCAW)
 - 3GF
 - 4GF
 - E491T-9 (E71T-1)
- b. Metal core arc welding (MCAW)
 - 3GF
 - 4GF
 - E49C-6 (E70C-6)
- c. Gas metal arc welding (GMAW)
 - 3G
 - 4G
 - 2G-5G Pipe
 - ER49S-6 (ER70S-6)

Welder

Unit: C4 Gas Tungsten Arc Welding II

Level: Three

Duration: 70 hours

Theory: 21 hours

Practical: 49 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of gas tungsten arc welding (GTAW). Beginning with terminology and safe work practices, the unit reviews GTAW equipment, consumables, shielding gas and accessories. The unit covers GTAW weldability cause and effects. The unit also covers the procedures for GTAW set-up, start up and shut down. Finally, apprentices will demonstrate and perform welds using the GTAW processes on mild steel pipe, stainless steel and aluminum plate.

Objectives and Content:	Percent of Unit Mark (%)
1. Review terminology associated with gas tungsten arc welding (GTAW). a. Refer to Welder Red Seal Occupational Standard (RSOS)	5%
2. Identify hazards and describe safe work practices for GTAW.	5%
3. Identify and interpret codes, standards and regulations pertaining to welding using the GTAW process.	5%
4. Review GTAW equipment, consumables and their characteristics, applications and operations. a. Power sources <ul style="list-style-type: none"> Inverter technology Polarity settings Types of currents Duty cycle b. Equipment controls <ul style="list-style-type: none"> High frequency Square wave controls AC amperage frequency control AC balancer Pulse controls c. Base metal <ul style="list-style-type: none"> Thickness Ferrous and non-ferrous d. Tungsten electrode types and color codes <ul style="list-style-type: none"> Pure Thoriated 	5%

- Zirconiated
- Lanthanated
- Ceriated
- Rare earth
- e. Welding position
- f. Torches
 - Air cooled
 - Liquid cooled
- g. Digital technology
 - Waveform programming
 - Real-time monitoring
 - Pre-sets

5. Review shielding gas requirements for GTAW. 5%

- a. Types
 - Argon
 - Helium
 - Mixed gases
- b. Selection factors
 - Mild Steel
 - Stainless steel
 - Aluminum
 - Specialty materials
- c. Tables / flow rates
- d. Regulators / flow meters
- e. Purging
 - Pre-purge
 - Post purge pulse

6. Review GTAW accessories. 5%

- a. Torch types
 - Air and liquid cooled
 - Size
 - Amperage capacities
 - Gas lenses
 - Collets and collet body
 - Flexible and rigid style
- b. Torch controls
 - Foot controls
 - Torch mounted controls
 - Remote controls
- c. Purging equipment
 - Caps
 - Dams
 - Valves
- d. Consumables inserts

7. Describe the procedures for GTAW weldability cause and effects. 20%

- a. Oxide removal
 - Wire wheels
 - Wire brushes

- Chemical cleaners
- b. Heat dissipation
- c. Copper based alloys
 - Brasses
 - Bronzes
- d. Aluminum alloys
- e. Specialty alloys
 - Magnesium
 - Titanium
 - Zirconium
- f. Damming and purging methods
- g. Tacking, backstepping and sequencing techniques
 - Penetrating
 - Bridge
- h. Weld tie-ins
 - Stop arc
 - Re-start arc
 - Finish weld
- i. Weld discontinuities and defects
 - Visually inspect
 - Repair by grinding/gouging and re-welding

8. Describe and demonstrate the procedures for GTAW set-up, start up and shut down for carbon steel pipe, stainless steel and aluminum plate. 20%

- a. Equipment maintenance
- b. Material preparation and fit-up
 - Pre-weld cleaning methods
 - Welding position
- c. Equipment
 - Current type and polarity
 - Amperage
 - Arc initiation method
- d. Torch
 - Collet and body
 - Nozzle type and size
 - Tungsten electrode type and size
- e. Shielding gas
 - Type
 - Flow rate
 - Purging
- f. Filler metals
 - Type (alloy)
 - Size
 - Joint type and design
 - Rod storage
- g. Autogenous (no filler) welding technique
- h. Torch manipulation techniques
 - Walking the cup
 - Forehand and backhand
 - Bead width and shape
- i. Verify setup
 - Test specimen of same base metal, electrode filler metal and position

9. Perform welds using the GTAW process.

30%

- a. Carbon steel pipe
 - Schedule 40
 - R40 filler rod
 - 2g-5g position
 - ER49S-2/3 (ER70S-2/3)
- b. Stainless steel plate
 - Fillet weld
 - ER308L filler rod
 - All positions
- c. Aluminum plate
 - Fillet weld
 - ER5356 filler rod
 - All positions
- d. Perform post-weld operations
 - Prepare completed welds to specifications
 - Visually inspect finished welds

Welder

Unit: C5 Submerged Arc Welding II

Level: Three

Duration: 14 hours

Theory: 14 hours

Practical: 0 hours

Overview:

This unit is designed to provide the apprentice with the knowledge and skills of submerged arc welding (SAW). Beginning with terminology and safe work practices, the unit covers SAW consumables and their characteristics, applications and operation. The unit also covers SAW equipment set up and operating parameters. Finally, apprentices will review the procedures to perform welds using SAW equipment.

Objectives and Content:	Percent of Unit Mark (%)
1. Define terminology associated with submerged arc welding (SAW). a. Refer to Welder Red Seal Occupational Standard (RSOS)	15%
2. Identify hazards and describe safe work practices of SAW. a. Burns, fumes and hazardous gases b. Falling objects, fire hazards, falling and slip hazards	10%
3. Identify codes, standards and regulations pertaining to SAW.	10%
4. Identify and describe SAW consumables and their characteristics, applications and operation. a. Electrode <ul style="list-style-type: none"> Type Diameter Storage Tensile strength Position Composition Metric and imperial designations b. Flux <ul style="list-style-type: none"> Fused Bonded Active Reactive Neutral c. Filler wire <ul style="list-style-type: none"> Types Designation 	35%

- Application
- d. Base metals
 - Metals that can and cannot be welded
 - Ferrous and non-ferrous metals
- e. Weld types
 - Fillet
 - Groove
 - Surfacing
- f. Polarity
 - Direct current electrode positive (DCEP)
 - Direct current electrode negative (DCEN)
 - Alternating

7. Review and demonstrate the procedures to perform welds using SAW equipment. 30%

- a. Equipment maintenance
- b. Start-up equipment
- c. Adjust head height
 - maintain stick-out and to control flux coverage
- d. Verify setup
 - Dry run to ensure tracking consistency
- e. Initiate arc
 - Wire feed
 - Travel
 - Current
- f. Monitor and adjust travel speed and angle
 - Consistent tracking
- g. Recover, filter and demagnetize flux
- h. Stop arc
 - Tie-ins
- i. Remove slag
- j. Weld discontinuities
 - Visually inspect for defects
 - Determine cause
 - Repair using grinding/gouging and re-welding
- k. Shut down equipment

Welder

Unit: C7 Journeyperson Trainer

Level: Three

Duration: 7 hours

Theory: 7 hours

Practical: 0 hours

Overview:

Level 1 in-school technical training offers an entry-level orientation to the challenges of apprenticeship training as it relates to the development of core tasks, skill requirements, and social competencies. This unit introduces senior apprentices to the responsibilities of workplace training that they will assume as supervising journeypersons. Most trades have a rich tradition of refreshing and sharing their trade skills from one generation of trade practitioner to the next. This unit orients senior apprentices to some of the practical and conceptual tools that can enable them to contribute to this trade heritage when they become certified journeypersons and, ultimately, journeyperson trainers.

The journeyperson's obligation to assist entry-level apprentices to develop skills and knowledge is complex and challenging. It involves safety considerations, employer expectations, provincial regulations, as well as the tradition of skills stewardship that links modern practice with the long history of workplace teaching and learning that defines the apprenticeable trades. The ability to offer timely and appropriate support to apprentices is itself an important area of trade learning. This unit presents material intended to help refine this ability through reflection and discussion by senior apprentices, and discussion with their in-school instructor and journeyperson trainer.

This content reflects Manitoba and Canadian standards prescribed for journeyperson-level supervisory capabilities, as well as key topics in current research on the importance of workplace training in apprenticeship systems. These detailed descriptors represent suggested focal points or guidelines for potentially worthwhile exploration, and are neither mandatory nor exhaustive.

Objectives and Content:

**Percent of
Unit Mark (%)**

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <p>1. Compare/contrast role-options and responsibilities of the supervising journeyperson.</p> <ul style="list-style-type: none"> a. Implicit vs. explicit standards and content: training goals are/are not codified; assessment measures are/are not used b. Accountability for results: e.g., journeyperson is/is not required to prepare performance evaluation that could affect apprentice's employability or wage-rate, etc. c. Long-term vs. short-term supervision assignments – e.g., considerable latitude/little latitude for apprentice to learn from mistakes d. Formally vs. informally structured – e.g., supervision assignment is part of a prescribed cycle of assignments involving coordination among multiple journeypersons; apprentice is trained according to an individual training plan negotiated with employer e. Types of supervisory role options and what is implied by each: <ul style="list-style-type: none"> • Journeyperson Trainer (JT) role: often initiated by someone other than apprentice, and limited to a particular skill set, task, or production requirement • Mentor role: often initiated by apprentice, and relatively open-ended regarding | <p>50%</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|

content, duration, etc.

- Peer role: typically involves individual upgrading or cross-training of one journeyperson by another; can include senior apprentice assisting less-experienced trade learner
- Coordinator role: often a senior-level journeyperson appointed by an organization to assume responsibilities for monitoring progression of groups of apprentices
- Other roles: may be improvised by journeyperson, such as combination or multiple roles of the above

2. Describe and demonstrate common requirements about providing journeyperson level supervision. 50%

- a. Apprenticeship learning adapted to journeyperson supervision assignments and a journeyperson perspective
 - Application of adult education concepts to trades teaching and learning (e.g., responsibilities and expectations of senior-level apprentices)
 - Practical significance of 'styles' of adult learning and teaching
 - Helping senior-level apprentices integrate in-school technical training and on-the-job practical training experiences
 - Providing help and guidance about new tasks and skills
 - Providing help and guidance about fixing mistakes
 - Learning and teaching "the ropes" – socialization of apprentice within a community of trade practice (e.g., how to borrow a tool, interrupt a journeyperson, and seek advice of experienced co-workers)
 - Coverage and documentation of prescribed tasks and subtasks where applicable
 - Discuss the limits of the journeyperson trainers' own responsibilities and competence (e.g., scope, willingness to train, etc.)
 - Benefits of maintaining a personal record of achievements, ideas, and needs as a journeyperson trainer (e.g., resume, portfolio, training credentials, logbook, etc.)
- b. Individual reflection and guided group discussion about personal experiences of workplace learning as an apprentice
 - Identification of best and worst practices of journeyperson trainer
 - Identification of workplace and other factors that can contribute to good and bad trades teaching/learning experiences
 - Development of professional standards and work ethic regarding one's responsibility to share one's knowledge and skills with others in the workplace (e.g., use/misuse of humour, rigour, discretion, craft-pride, etc.)
 - Qualities of a good journeyperson trainer
 - Components of workplace journeyperson training
 - Processes and recommended practices re: journeyperson training
 - Troubleshooting problems re: supervision assignments
- c. Role of assessment in supervising, coaching, or guiding other people to learn or improve their skills (e.g., formative and summative evaluation), and how this might contribute to how the journeyperson-level supervision task is approached in future
- d. Compare and contrast discussion results with current knowledge and resources about workplace training methods as they apply to journeyperson-level supervision assignments
- e. Other (as may be specified by instructor)

Welder

Unit: C8 Pre-Interprovincial Exam Review

Level: Three

Duration: 35 hours

Theory: 35 hours

Practical: 0 hours

Overview:

This unit offers senior apprentices a systematic review of skills and knowledge required to pass the Interprovincial Examination. It promotes a purposeful personal synthesis between on-the-job learning and the content of in-school technical training. The unit includes information about the significance of Interprovincial (Red Seal) certification and the features of the Interprovincial Examination.

Note: No percentage-weightings for test purposes are prescribed for this unit's objectives. Instead, a 'Pass/Fail' grade will be recorded for the unit in its entirety.

Objectives and Content:	Percent of Unit Mark (%)
<p>1. Describe the significance, format and general content of Inter-Provincial (IP) Examinations for the trade of Welder.</p> <ul style="list-style-type: none"> a. Scope and aims of Interprovincial (Red Seal) certification; value of certifications b. Obligations of candidates for Interprovincial certification <ul style="list-style-type: none"> • Relevance of Interprovincial Examinations to current, accepted trade practices; industry-based provincial and national validation of test items • Supplemental Policy (retesting) • Confidentiality of examination content c. Multiple-choice format (four-option) item format, Red Seal standards for acceptable test items d. Government materials relevant to the Interprovincial Examinations for apprentices <ul style="list-style-type: none"> • Red Seal Occupational Standard (RSOS) – for Welder; prescribed scope of the skills and knowledge which comprise the trade • RSOS “Pie-chart” and its relationship to content distribution of Interprovincial Examination items • Red Seal Examination Breakdown • Red Seal Self-Assessment Guide • Apprenticeship Manitoba Technical Training package 	n/a
<p>2. Identify resources, strategies and other considerations for maximizing successful completion of written examinations.</p> <ul style="list-style-type: none"> a. Personal preparedness <ul style="list-style-type: none"> • Rest • Nutrition • Personal study regimen • Prior experience in test situations (e.g., Unit Tests) 	n/a

- b. Self-assessment, consultation and personal study plan
 - Self-assessment of individual strengths/weaknesses in trade related skills and knowledge
 - Approved textbooks
 - Study groups
3. **Review program content regarding the major work activity of performs common occupational skills.** n/a
 4. **Review program content regarding the major work activity of performs layout and fabrication of components for welding** n/a
 5. **Review program content regarding the major work activity of performs cutting and gouging.** n/a
 6. **Review program content regarding the major work activity of performs welding processes** n/a

Welder

Unit: C8 Welder Practical Examination III

Level: Three

Duration: 7 hours

Theory: 0 hours

Practical: 7 hours

Overview:

This unit is designed to verify required weld competency as part of the Manitoba welder practical examination. These required welds will be performed during Level 3 technical training to meet or exceed industry standards and national welding benchmarks. All individual processes below are pass/fail. All objectives must be passed to achieve a unit pass during technical training. Successful completion of this unit and the unique welding operations are a requirement for progression to the next level of technical training.

Note: No percentage-weightings for test purposes are prescribed for this unit's objectives. Instead, a "Pass/Fail" grade will be recorded for the unit in its entirety.

Objectives and Content:	<u>Percent of Unit Mark (%)</u>
<ol style="list-style-type: none"> 1. Perform groove weld assembly using shielded metal arc welding (SMAW) <ol style="list-style-type: none"> a. Mild steel test plate b. Weld position <ul style="list-style-type: none"> • 3GF/4GF (combination vertical/overhead) c. Electrodes <ul style="list-style-type: none"> • E4918 (E7018) d. Follow provided drawing and specifications e. Testing procedure <ul style="list-style-type: none"> • Visual examination • Destructive bend test 	n/a
<ol style="list-style-type: none"> 2. Perform groove weld assembly using flux core arc welding (FCAW) <ol style="list-style-type: none"> a. Mild steel test plate b. Weld position <ul style="list-style-type: none"> • 3g • 4g c. Wire <ul style="list-style-type: none"> • E491T-9 (E71T-1) d. Follow provided drawing and specifications e. Testing procedure <ul style="list-style-type: none"> • Visual examination • Destructive bend test 	n/a
<ol style="list-style-type: none"> 3. Perform groove weld assembly using gas tungsten arc welding (GTAW) <ol style="list-style-type: none"> a. Mild steel test plate 	n/a

- b. Weld position
 - 2g
- c. Filler rod
 - ER49S (ER70S)
- d. Follow provided drawing and specifications
- e. Testing procedure
 - Visual examination
 - Destructive bend test
