WELD1 – Welder Apprenticeship Level 1

Trades

Effective Term & Year: Fall 2022
Program Outline Review Date: 2027-09-01

Program Area: Trades Apprenticeship Training

Description:

This 8-week program delivers the skills, knowledge and training required for Level 1 of the Welder Apprenticeship program. Program competencies include practical and theoretical applications in the following processes: oxy fuel cutting and gouging (OFC), carbon arc cutting and gouging (CAC-A), plasma arc cutting and gouging (PAC), shielded metal arc welding (SMAW), gas metal arc welding (GMAW) and flux core arc welding (FCAW). Students also develop the ability to read and interpret blue prints and welding symbols. This program includes classroom theory, demonstrations and practical hands-on training in a welding shop. Safe work practices are important in this trade and emphasized, reinforced and practiced throughout the program.

Credentials Granted:

Upon successful completion of the 8-week Level 1 Welder Apprenticeship program, students receive:

- Level 1 technical training credit for the Welder Apprenticeship program from SkilledTradesBC

Delivery Methods: On-Campus (Face-to-Face), Online

Program Duration: 8 weeks

Instructional Activity and Hours:

Activity	Hours
Instructional Hours (hrs/wk)	28 hrs/wk
Directed Studies (hrs/wk)	2 hrs/wk
Total (hrs/wk)	30 hrs.wk
Total Program Hours	240 Hours

Content Weighting:

Activity	Percentage
Theory	20%
Practical Skills	80%

Admission Requirements:

Sponsored Welder apprentice.

Flexible Assessment:

Credit cannot be awarded for this program through Flexible Assessment.

Program Transfer Credit:

For information about block transfer agreements between programs in British Columbia, Alberta, and elsewhere, please visit http://www.cotr.bc.ca/transfer.

To minimize transfer issues, check with an academic advisor at the institution that will receive the transfer credits.

Textbooks and Required Resources:

Textbook selection varies by instructor and may change from year to year. At the Program Outline Effective Date the following textbooks were in use (most current edition):

Welding “C” Level Modules, Queen’s Printer.

Althouse, A.D., Turnquist, C.H., Bowditch, W.A., Bowditch, K.E., & Bowditch, M.A., (2013).

Modern Welding. (11th ed). Tinley Park, IL: The Goodheart – Wilcox Company Inc.

Program Competencies and Technical Training Content:

Upon the successful completion of this program, students will be able to:

WEAP 101 Occupational Skills (22 hrs)

- Describe safe working practices
- Perform basic trade related mathematical calculations
- Use and maintain measuring and layout tools
- Use and maintain hand tools
- Use and maintain power tools (electric and pneumatic)
- Describe shop materials
- Apply lifting, hoisting and rigging procedures

WEAP 102 Cutting and Gouging Processes (OFC and OFG, CAC-A, PAC) (22 hrs)

- Describe Oxy-Fuel Cutting (OFC) processes and their applications
- Describe Oxy-Fuel Cutting (OFC) and equipment and its operation
- Perform freehand and guided cuts on low carbon steel (OFC)
- Use automatic and semi-automatic cutting machines (OFC)
- Describe CAC-A and PAC processes, equipment and their applications
- Use CAC-A and PAC cutting and gouging processes and equipment

WEAP 103 Fusion and Braze Welding Using Oxy-Fuel (OFW) Processes (14 hrs)

- Describe fusion welding, braze welding and brazing processes and their applications
- Describe fusion welding, braze welding and brazing equipment and its operation
- Describe filler metals, fluxes and tips used for fusion welding, braze welding and brazing
- Describe joint design and weld positions for OFW
- Fusion weld on low carbon steel sheet
- Braze weld (TB) using the OFW process
- Silver alloy braze on similar and dissimilar metals

WEAP 104 Shielded Metal Arc Welding (SMAW) (90 hrs)

- Describe the SMAW process
- Describe SMAW equipment and its operation
- Select electrodes for SMAW
- Describe basic joint design and weld positions for SMAW
- Describe weld faults and distortion in fabrications in SMAW
- Use the SMAW process on low carbon steel plate and pipe
- Use the hardsurfacing process on low carbon steel
- Use the SMAW process on stainless steel and/or low carbon steel plate and pipe

WEAP 105 Semi-Automatic and Automatic Welding (67 hrs)

- Describe GMAW, GMAW-P, FCAW, MCAW and SAW processes and their applications
- Describe semi-automatic and automatic welding equipment and its operation
- Describe filler metal and shielding gases for semi-automatic and automatic processes
- Use the GMAW and GMAW-P processes
- Use the FCAW process

WEAP 108 Welding Drawings, Layout and Fabrication (9 hrs)

- Identify common welding symbols and bolted connections

Evaluation and Assessment:

WELDER APPRENTICESHIP LEVEL 1

COTR COURSE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
WEAP 101	Occupational Skills	20%	10%
WEAP 102	Cutting and Gouging Processes	18%	10%
WEAP 103	Fusion and Braze Welding (TB) Using Oxy-Fuel (OFW) Process	5%	5%
WEAP 104	Shielded Metal Arc Welding (SMAW)	22%	35%
WEAP 105	Semi-Automatic and Automatic Welding	25%	30%
WEAP 108	Welding Drawings, Layout and Fabrication	10%	10%
	Total	**100%**	**100%**
In-school theory & practical subject competency weighting		20%	80%
Final in-school percentage score		**IN-SCHOOL %**	
In-school Percentage Score Combined theory and practical subject competency multiplied by		80%	
Standard Level Exam Percentage Score The exam score is multiplied by		20%	
Final Percentage Score		**FINAL%**	

Pass Requirements:

Students must obtain a mark of 70% or better in theory and 70% on all practical projects to successfully complete the program.

Students must provide their own:

- steel-toed leather work boots
- safety glasses
- welding gloves

- flame retardant work clothes (cotton or wool)
- leather welding jacket
- welding helmet (#11 lens)
- welding goggles (#5 lens)
- Reference Manuals
- personal half mask respirator
- P100 particulate filters (3 or 4 sets)

Academic Policies:

College of the Rockies policies related to courses can be found at https://cotr.bc.ca/about-us/college-policies/ and include the following:

- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.4.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

Program Grade

COM	NCG
Completed to the defined standard – 70% or greater	No Credit Granted – less than 70%

Program Changes:

Information contained in program outlines is correct at the time of publication. Content of the program is revised on an ongoing basis to ensure relevance to changing educational, employment, and marketing needs. The instructor endeavours to provide notice of changes to students as soon as possible. The instructor reserves the right to add material to programs.

Industry Training:

The program competencies and technical training content delivered in this program follow the SkilledTradesBC Program Outline for this trade.

Safety Catalog:

WorkSafeBC regulations apply to all trades programs. Students are expected to follow all safe work practices and have high regard for the safety of others as well as of themselves. Students are responsible to wear personal protective equipment (PPE) as directed. At a minimum, students must provide and wear approved safety footwear and eyewear at all times in the shop.

Additional PPE may be required for specific tasks. Students are expected to wear clothing suitable for working safely in the shop.