



WELDF – Welder Foundation Program

Trades

Effective Term & Year: Fall 2022

Program Outline Review Date: 2026-04-01

Program Area: Trades Foundation Training

Description:

This comprehensive 28-week Welder Foundation (pre-apprenticeship) program provides students an opportunity to gain the skills, knowledge and training necessary to enter the welder trade and covers the program competencies for Level 1 and Level 2 of the Welder Apprenticeship program. Students learn techniques in cutting, gouging, oxy-fuel welding, shield metal arc welding, semi-automatic welding, gas metal arc welding, gas metal arc welding pulsed, flux core arc welding, metal core arc welding and submerged arc welding. In addition, students will be able to perform basic weld joints using gas tungsten arc welding. The program includes classroom theory, demonstrations and practical hands-on training in a welding shop. Safe work habits are emphasized, reinforced and practices throughout the program.

Credentials Granted:

Upon successful completion of the 28-week Welder Foundation program, students receive:

- College of the Rockies Welder Foundation Program Certificate

Students will also receive from SkilledTradesBC:

- Level 1 and 2 Technical Training credit
 - Certificate of Completion
 - Credit for 300 Work-based Training hours
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Delivery Methods: Face-to-Face, Online

Program Duration: 28 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	840 Hours

Content Weighting:

Activity	Percentage
Classroom, Directed Studies or Online Instruction	20%
Seminar/Tutorials	80%

Admission Requirements:

Secondary school graduation or equivalent, or completion of a College of the Rockies assessment to an acceptable level.

Highly Recommended Admission Prerequisites:

The following education is **highly** recommended for student success within the program:

- Workplace MATH 10 and Apprenticeship MATH 12. Either Apprenticeship and Workplace Math 11, Trades Mathematics 11, or equivalent
- Either English 12, English Studies 12, English First Peoples 12, ENGL 090, or equivalent (refer to Course Equivalency information on the College Website)

Flexible Assessment:

Credit can 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):

BC Foundation Program Modules. Canadian Welder Bureau Group

Program Competencies and Technical Training Content:

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

WELD 101 Occupation Skills (55 hours)

- Describe welder apprenticeship and the scope of the trade in BC
- 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

WELD 102 Cutting and Gouging Processes (OFC and OFG CAC-A, PAC) (50 hours)

- Describe Oxy-Fuel Cutting (OFC) processes and their applications
- Describe Oxy-Fuel Cutting (OFC) equipment and its operation
- Perform free hand 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

WELD 103 Fusion and Braze Welding (TB) Using Oxy-Fuel (OFW) Process (25 hours)

- 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

WELD 104 Shielded Metal Arc Welding (SMAW) (325 hours)

- 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 hard-surfacing process on low carbon steel
- Describe the SMAW process on grey cast iron
- Use the SMAW process on stainless steel and/or low carbon steel plate and pipe

WELD 105 Semi-Automatic and Automatic Welding (235 hours)

- 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 process
- Use the FCAW process
- Use the MCAW process
- Use the SAW process

WELD 106 Gas Tungsten Arc Welding (GTAW) (30 hours)

- Describe the GTAW process and its application
- Describe GTAW equipment and its operation
- Describe the application of GTAW for ferrous metals
- Use the GTAW process for ferrous metals
- Use the GTAW process for stainless steel

WELD 107 Basic Metallurgy (14 hours)

- Describe production processes for manufacturing metals
- Describe mechanical and physical properties of ferrous and non-ferrous metals
- Describe common ferrous, non-ferrous, reactive metals and their weldability

WELD 108 Welding Drawings, Layout and Fabrication (50 hours)

- Identify common welding symbols and bolted connections
- Read and interpret drawings
- Perform basic drafting
- Perform mathematical calculations
- Interpret and apply mechanical drawings and layout components
- Fabricate weldments
- Costing and estimating

Evaluation and Assessment:

WELDER FOUNDATION

COTR COURSE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
WELD 101	Occupational Skills	17%	8%
WELD 102	Cutting and Gouging Processes (OFC and OFG CAC-A, PAC)	10%	5%
WELD 103	Fusion and Braze Welding (TB) Using Oxy-Fuel (OFW) Process	5%	3%
WELD 104	Shielded Metal Arc Welding (SMAW)	25%	37%
WELD 105	Semi-Automatic and Automatic Welding	25%	35%
WELD 106	Gas Tungsten Arc Welding (GTAW)	3%	4%
WELD 107	Basic Metallurgy	5%	2%
WELD 108	Welding Drawings, Layout and Fabrication	10%	6%
	Total	100%	100%
Welder Foundation 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:

- Successful completion of the in-school training is defined as a final overall minimum of 70% to meet SkilledTradesBC standards.
 - Students must maintain an acceptable level of attendance, complete all assigned projects and pass all exams to successfully complete the program.
 - Complete of all Workplace Health and Safety courses within 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)
- computer
- reference manuals
- personal half mask respirator
- p100 particulate filters (3 or 4 sets)

Workplace Health and Safety Courses:

Workplace Hazardous Material Information System (WHMIS: PVHE-700)

Transportation of Dangerous Goods (TDG: PVHE-701)

Occupational First Aid – Level 1 (OFA-1: PVHE-100)

Workplace Health and Safety Courses Grade Scheme:

COM	NCG
Completed to the minimum defined standard	No credit granted – less than minimum defined standard

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 2.5.8 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.

Course Descriptions: Refer to Course Outlines – <https://outlines.cotr.bc.ca/course/>