

**TRADE: WELDING
LEVEL / YEAR: ONE**

Apprenticeship Course Outline

(based on former ITAC curriculum)

WELDING - YEAR 1

- P1 Program Intro & Safety
- P2 Gas Cutting (Oxy-Fuel Gas)
- P3 Gas Welding & Braze Welding Part 1
- P4 Shielded Metal AR H Welding Part I
- P5 Carbon Arc Gouging
- P6 GMAW & FCAW Part I

WELDING - YEAR 2

- P3 Gas Welding & Braze Welding Part II
- P4 Shielded Metal Arc Welding Part II
- P6 GMAW & FCAW Part II
- RK1 Material Handling
- RK2 Blueprint Reading
- RK3 Metallurgy I

WELDING - YEAR 3

- P7 Shielded Metal Arc Welding (SMAW)
- P10 Gas Tungsten Arc Welding (GTAW)
- RK4 Quality Control & Inspection Procedure
- RK5 Welding Code Standards & Specifications
- RK6 Blueprint Reading II
- RK7 Metallurgy II

WELDING - YEAR 4

- P11 SMAW III
- P12 GTAW II
- P8 GMAW or P9 FCAW
- RK8 Metallurgy III
- RK9 Blueprint Reading III

LEVEL C WELDING

Module	P1	Introduction and Program Orientation
	1	Describe the Welder Training Program in British Columbia
	2	Use Safe Work Practices
	3	Identify Hand Tools and Their Uses
	4	Identify Power Tools and Their Uses
	5	Use Hand and Power Tools

Module	P2	Oxy-fuel Cutting
	1	Describe the Oxy-fuel Gas Cutting Process and Its Applications
	2	Describe Oxy-fuel Gas Cutting Equipment
	3	Assemble, Ignite, Shut Down and Maintain Oxy-fuel Gas Cutting Equipment
	4	Perform Freehand and Guided Cuts on Mild Steel Plate, Sheet and Pipe
	5	Perform Cuts With Cutting Machine

Module	P3	Gas Welding and Braze Welding	
1		Describe the Fusion Welding, Braze Welding and Brazing Processes and Their Applications	
2		Identify Filler rods, Fluxes and Tips for Fusion Welding, Brazing and Braze Welding	
3		Fusion Weld Stringer Beads in the Flat Position on Mild Steel Sheet	
4		Fusion Weld Fillet Welds on Mild Steel Sheet	
5		Fusion Weld Groove Welds on Mild Steel Sheet	
6		Fusion Weld Groove Welds on Mild Steel Pipe	
7		Braze Weld Fillet Welds on Mild Steel Sheet	
8		Braze Weld Groove Welds on Mild Steel Sheet	
9		Braze Weld and Fusion Weld Groove Welds on Grey Cast Iron	
10		Silver Braze on Similar and Dissimilar Metals	

Module	P4	Shielded Metal Arc Welding (SMAW I)	
1		Describe Shielded Metal Arc Welding and Its Applications	
2		Identify Shielded Metal Arc Welding Equipment and its Operation	
3		Identify Mild Steel Electrodes for Shielded Metal Arc Welding	
4		Identify Basic Joint Design and Weld Positions	
5		Identify the Causes of Faults and Distortion in Welds and Methods for Their Prevention	
6		Shielded Metal Arc Weld Beads in the Flat Position on Mild Steel Plate	
7		Shielded Metal Arc Weld Fillet Welds on Mild Steel Plate	
8		Shielded Metal Arch Weld Fillet Welds on Mild Steel Plate	
9		Shielded Metal Arc Weld Groove Welds on Mild Steel Plate	
10		Hardsurface and Hardface in the Flat Position on Mild Steel Plate	
11		Shielded Metal Arc Weld Groove Welds in the Flat 1G Position on Grey Cast Iron	

Module	P5	Air Carbon Arc Grouping	
1		Describe the Air Carbon Arc Cutting Process	
2		Describe Air Carbon Arc Cutting Equipment	
3		Gouge Using the Air Carbon Arc Cutting Process	
4		Describe the Plasma Arc Cutting Process	
5		Describe Plasma Arc Cutting Equipment	
6		Perform Cuts Using Plasma Arc	

Module	P6	Gas Metal Arc Welding (GMAW I) & Flux Cored Arc Welding (FCAW I)	
1		Describe the Gas Metal and Flux Cored Arc Welding Process	
2		Describe Gas Metal Arc Welding and Flux Cored Arc Welding Equipment	
3		Identify Electrode Wires for GMAW and FCAW	
4		Gas Metal Arc Weld Fillet Welds on Mild Steel Plate	
5		Gas Metal Arc Weld Fillet and Groove Welds on Mild Steel Sheet	
6		Gas Metal Arc Weld Groove Welds on Mild Steel Plate	
7		Flux Cored Arc Weld Fillet Welds on Mild Steel Plate	
8		Flux Cored Arc Weld Groove Welds on Mild Steel Plate	
9		Gas Metal Arc Weld Fillet and Groove Welds Using Alternate Shielding Gases	
10		Gas Metal Arc Weld Fillet Welds on Aluminum Plate	

Module	RK1	Material Handling	
1		Identify Materials Handling Equipment	
2		Identify Materials Handling Procedures	
3		Move Materials	

Module RK2A Blueprint Reading I		
1	Sketch Basic Objects Using Orthographic Projection	
2	Sketch Isometric Drawings	
3	Sketch a Dimensional Drawing	
4	Identify Common Welding Symbols and Bolted Connections	
5	Interpret Structural Drawings	

Module RK2B Mathematics		
1	Solve Problems Involving Fractions	
2	Solve Problems Using Decimals	
3	Use Metric Measurement	
4	Solve Problems Involving Percent	
5	Calculate Roots and Powers	
6	Solve Problems Involving Geometric Formulas	
7	Solve Problems Involving Angles, Triangles and Geometric Constructions	

Module RK3 Welding Metallurgy I		
1	Identify the Mechanical and Physical Properties of metals	
2	Describe Iron and Steel	
3	Identify Metals	

LEVEL B WELDING

Module P7 Shielded Metal Arc Welding (SMAW II)		
1	Shielded Metal Arc Weld Groove Welds on Mild Steel Plate	
2	Shielded Metal Arc Weld Groove Welds on Mild Steel Pipe	

Module P8 Gas Metal Arc Welding (GMAW II)		
1	Review Safety Requirements and Welding Variables for Gas Metal Arc Welding	
2	Gas Metal Arc Weld Fillet Welds on Aluminum Plate	
3	Gas Metal Arc Weld Groove Welds on Aluminum Plate	
4	Gas Metal Arc Weld Groove Welds on Mild Steel Plate	
5	Gas Metal Arc Weld Groove Welds on Mild Steel Pipe	

Module P9 Flux Cored Arc Welding (FCAW II)		
1	Review Safety Requirements and Welding Variables for Flux Cored Arc Welding	
2	Hardsurface Mild Steel Plate in the Flat Position	
3	Flux Cored Arc Weld Fillet Welds on Mild Steel Plate	
4	Flux Cored Arc Weld Groove Welds on Mild Steel Plate	

Module P10 Gas Tungsten Arc Welding (GTAW I)		
1	Describe the Gas Tungsten Arc Welding process and its Applications	
2	Identify and Assemble Gas Tungsten Arc Welding Equipment	
3	Gas Tungsten Arc Weld Fillet Welds Using Mild Steel Filler Rod on Mild Steel Plate	
4	Gas Tungsten Arc Weld Groove Welds Using Mild Steel Filler Rod on Mild Steel Plate	
5	Gas Tungsten Arc Weld Fillet Welds Using Stainless Steel Filler Rod on Stainless Steel Sheet	
6	Gas Tungsten Arc Weld Groove Welds Using Mild Steel Filler Rod on Stainless Steel Sheet	
7	Gas Tungsten Arc Weld Fillet Welds Using Aluminum Filler Rod on Aluminum Sheet	
8	Gas Tungsten Arc Weld Groove Welds Using Aluminum Filler Rod on Aluminum Plate	

Module	RK4	Welding Quality Control and Inspection Procedures	
	1	Identify Types and Uses of Destructive Testing Methods	
	2	Identify the Types and Uses of Non-destructive Testing Methods	

Module	RK5	Welding Codes, Standards and Specifications	
	1	Describe the Scope of Welding Codes, Standards and Specifications	

Module	RK6	Blueprint Reading II	
	1	Read and Interpret Piping Drawings	
	2	Perform Basic Pipe Layout	

Module	RK7	Welding Metallurgy	
	1	Describe the Grain Structure of Metals	
	2	Identify the Effects of Alloy content and Heat Treatments on the Weldability of Steel	
	3	Identify Aluminum, Aluminum Alloys and Their Weldability	

LEVEL A WELDING

Module	P11	Shielded Metal Arc Welding (SMAW III)	
	1	Shielded Metal Arc Weld Groove Welds Using Low-alloy Electrodes on Steel Plate and Pipe	
	2	Shielded Metal Arc Weld Groove Welds Using Stainless Steel Electrodes on Steel Plate and Pipe	

Module	P12	Gas Tungsten Arc Welding (GTAW II)	
	1	Gas Tungsten Arc Weld Groove Welds Using Mild Steel Filler Rod on Mild Steel Pipe	
	2	Gas Tungsten Arc Weld Groove Welds Using Stainless Steel Filler Rod on Steel Pipe	
	3	Gas Tungsten Arc Weld Groove Welds on Thin Wall Stainless Steel Pipe	
	4	Gas Tungsten Arc Weld Groove Welds Using Aluminum Filler Rod on Aluminum Pipe	

Module	RK8	Welding Metallurgy III	
	1	Identify Common Non-ferrous Metals and Their Weldability	
	2	Identify Reactive Metals and Their Weldability	
	3	Identify Die Castings and Their Weldability	

Module	RK9	Blueprint Reading III	
	1	Interpret Details Drawings of Transition Pieces	
	2	Interpret Detail Drawings of a Rolling Offset	

P= Practical RK= Related Knowledge

Due to the redevelopment of apprenticeships in BC course outlines are subject to change without notice. These course outlines are intended for use as an interim guide in the transition period.