

# WELDING (WELD)

This is a list of the Welding (WELD) courses available at KPU.

## **WELD 1010** **1 Credits**

### **Worksite Safety and Orientation**

Students will describe the scope of the welder trade in British Columbia. They will identify and respond to workplace hazards. Students will safely use and maintain welders' hand tools, power tools, and personal safety equipment. They will study the role of WorkSafeBC and their responsibility to apply its regulations and policies. Students will review basic occupational Mathematics.

*Not Transferable*

## **WELD 1115** **4 Credits**

### **Oxy Fuel Welding and Cutting**

Students will learn the function of each component in an oxy fuel welding and cutting system, and will assemble, test, adjust and operate this equipment. They will study the properties of high pressure oxygen, acetylene and propane gases, and will learn and apply oxy fuel safety standards. Students will develop skill by completing a variety of welding and cutting exercises.

*Prerequisites: WELD 1010*

*Not Transferable*

## **WELD 1120** **4 Credits**

### **Basic Shielded Metal Arc Welding**

Students will study shielded metal arc welding (SMAW) theory and applications. They will select, set up and adjust SMAW power sources. Students will learn the composition and classification of SMAW electrodes. They will develop skill by completing a variety of welded joints. Students will learn to apply SMAW safety standards.

*Prerequisites: WELD 1115*

*Not Transferable*

## **WELD 1130** **4 Credits**

### **Basic Gas Metal Arc Welding**

Students will study basic gas metal arc welding (GMAW) theory and application. They will select, set up, and adjust GMAW power sources and wire feeders. Students will learn the composition and classification of GMAW electrode wires and shielding gases. They will develop skill by completing a variety of weld joints. Students will learn and apply GMAW safety standards.

*Prerequisites: WELD 1120*

## **WELD 1140** **1 Credits**

### **Material Handling**

Students will study hand and power rigging techniques used by welders and fabricators. They will select and use slings, shackles, spreaders and related rigging hardware. Students will learn the concepts of safe working load, centre of gravity, and rigging limitations. They will learn and apply the Occupational Health and Safety Regulation and Guidelines of WorkSafe BC.

*Not Transferable*

## **WELD 1200** **1 Credits**

### **Air Arc and Plasma Arc Cutting**

Students will study air arc and plasma arc theory and application. They will select, set up, and operate plasma arc and air arc power sources. Students will use and maintain torches and related equipment. They will develop skills by cutting carbon steel, stainless steel and aluminum plate. Students will learn and comply with air arc and plasma arc safety standards.

*Prerequisites: WELD 1130*

*Not Transferable*

## **WELD 1210** **4 Credits**

### **Advanced Shielded Metal Arc Welding**

Students will study advanced Shielded Metal Arc Welding (SMAW) theory and application. They will describe the major components and operating principles of SMAW power sources. Students will review the composition and application of SMAW electrodes. They will further develop their skills by completing a variety of welded joints.

*Prerequisites: WELD 1200*

*Co-requisites: WELD 1220*

## **WELD 1220** **1 Credits**

### **Read Technical Drawings**

Students will read and interpret fabrication drawings. They will study the principles of orthographic and pictorial projections, including all lines, views and related information. Students will interpret symbols, abbreviations and material specifications. They will identify and solve dimensioning problems.

*Co-requisites: WELD 1210 WELD 1210*

*Not Transferable*

## **WELD 1230** **4 Credits**

### **Advanced Semi-Automated Weld**

Students will study advanced semi-automatic welding theory and application. They will develop the skill and knowledge needed to produce high-quality welds using a number of standard welding processes. Students will have their work visually and destructively tested.

*Prerequisites: WELD 1220*

*Not Transferable*

## **WELD 1240 (formerly WELD 1203)** **1 Credits**

### **Basic Metallurgy**

Students will study the physical and mechanical properties of ferrous and non ferrous metals. They will describe the manufacture and processing of iron and steel. Students will learn to identify metals using practical techniques. They will classify and describe applications of iron and steel products.

*Prerequisites: WELD 1220*

*Not Transferable*

## **WELD 1250** **2 Credits**

### **Stationary Shop Equipment**

Students will select, set up and operate stationary fabrication equipment. They will use and maintain press drills, stationary saws, iron workers and power squaring shears. Students will develop skill by working on individual and group projects. They will comply with fabrication machinery safety regulations.

*Co-requisites: WELD 1230 and 1240*

**WELD 1251** **2 Credits****Basic Metal Fabrication**

Students will develop the skills and knowledge needed to fabricate basic welded components. They will employ trades math, layout, cutting and assembly techniques. Students will select, set up and operate stationary fabrication equipment. They will use and maintain press drills, saws, iron workers, and power shears. Students will be required to work in teams and demonstrate effective project planning skills.

*Prerequisites: WELD 1010 and WELD 1220*

*Not Transferable*

**WELD 2100** **5 Credits****Shielded Metal Arc Pipe Welding**

Students will study pipe welding theory technique and safety using the Shielded Metal Arc Welding process (SMAW). They will learn appropriate tool use, pipe groove preparation and fitting techniques. Students will work with a variety of pipe diameters, schedules and electrodes. They will develop skill by welding pipe in all positions. Students will visually and destructively test their work

*Prerequisites: WELD 1210*

*Co-requisites: WELD 2110 WELD 2110*

**WELD 2110** **1 Credits****Welding Standards and Testing**

Students will study destructive and non-destructive testing methods applied to welded connections. They will learn and comply with welding codes and standards for structural steel, boilers and piping. Students will learn the importance of quality control and management in manufacturing, construction and maintenance operations. They will describe welding testing and certification

*Prerequisites: WELD 1210 & 1230*

*Co-requisites: WELD 2100*

**WELD 2120** **2 Credits****Gas Metal Arc Alloy Welding**

Students will study advanced Gas Metal Arc Welding (GMAW) techniques used to weld aluminum, stainless steel and alloy steel products, and the identification and correction of weld faults. They will review constant voltage power sources and specialized wire feeders. Students will select and use a variety of alloy electrode wires and shielding gases. They will develop skill by safely welding aluminum, stainless steel and alloy steels

*Prerequisites: WELD 2100 & 2110*

*Co-requisites: WELD 2130*

**WELD 2130** **1 Credits****Piping Drawings**

Students will read and interpret pipe fabrication and installation drawings. They will learn orthographic and isometric formats. Students will use symbols and terminology specific to pipe work. They will identify and describe applications for common pipe fittings and components and use piping mathematics. Students will lay out elbows, tees and offsets.

*Prerequisites: WELD 2100 & 2110*

*Co-requisites: WELD 2120*

**WELD 2140** **2 Credits****Advanced Flux Core Arc Welding**

Students will study advanced Flux Core Arc Welding (FCAW) techniques used in heavy machinery and structural fabrication. They will review constant voltage power source and wire feeder theory. Students will select and use gas shielded and self shielded electrodes. They will develop skill by completing a variety of welded joints to high standards using the appropriate safety equipment. Students will visually and destructively test their work.

*Prerequisites: WELD 2120 and 2130*

*Co-requisites: WELD 2150 WELD 2150*

**WELD 2150** **1 Credits****Alloy Metallurgy**

Students will study the microstructure of ferrous and non-ferrous alloys. They will describe the heat treatment of steel and aluminum. Students will identify the effects of alloy content on the weldability of steel and aluminum.

*Prerequisites: WELD 2120 and 2130*

*Co-requisites: WELD 2140*

**WELD 2160** **2 Credits****Basic Gas Tungsten Arc Welding**

Students will study Gas Tungsten Arc Welding (GTAW) theory and application. They will select, setup and adjust high frequency power sources. Students will learn the composition, classification and application of tungsten electrodes, shielding gases and filler material. They will develop skill by practicing a variety of welded joints on mild steel, stainless steel and aluminum using the appropriate safety equipment. Students will learn and apply GTAW regulations.

*Prerequisites: WELD 2140 and 2150*

**WELD 2200** **2.5 Credits****Shielded Metal Arc Alloy Welding**

Students will study alloy steel and stainless steel welding using the Shielded Metal Arc Welding (SMAW) process. They will select and use specialized coated electrodes. Students will prepare and fit alloy plate and pipe. They will develop skill by completing a variety of welded joints, and identify and correct weld faults. Students will visually and destructively test their work.

*Prerequisites: WELD 2160*

*Co-requisites: WELD 2210*

**WELD 2210** **1 Credits****Advanced Alloy Metallurgy**

Students will study the weldability of non-ferrous and reactive metals. They will learn the physical and mechanical properties of nickel, copper, magnesium, titanium and zirconium alloys. Students will describe joint geometry, joint preparation, cleaning and shielding methods. They will identify and correct welding problems.

*Prerequisites: WELD 2160*

*Co-requisites: WELD 2200*

**WELD 2220****3 Credits****Gas Tungsten Arc Alloy Welding**

Students will study alloy steel and stainless steel welding using the Shielded Metal Arc Welding (SMAW) process. They will select and use specialized coated electrodes. Students will prepare and fit alloy plate and pipe. They will develop skill by completing a variety of welded joints, and identify and correct weld faults. Students will visually and destructively test their work.

*Prerequisites: WELD 2200 and WELD 2210*

*Co-requisites: WELD 2230*

**WELD 2230****1 Credits****Plate and Pipe**

Students will study parallel line development, radial line development and triangulation. They will lay out and develop offsets, cones and square to round transitions. Students will solve angles, circumference and true lengths required for pipe and plate development.

*Prerequisites: WELD 2200 and WELD 2210*

*Co-requisites: WELD 2220*