South Central College

WELD 1146 Advanced Gas Tungsten Arc Welding

Common Course Outline

Course Information

Description	In this course students will obtain a better knowledge of how to access the programs of the different machines being used. Students will weld in out of position welds. This course will give students more lab time to practice pipe welding. Students will also learn how to pulse gas tungsten arc welding on stainless steel and Aluminum. (Prerequisite: WELD 1045 - Introduction to GTAW or equivalent from another technical college or instructor approval.)
Total Credits	3
Total Hours	80

Types of Instruction

Instruction Type	Credits/Hours
Lecture	1/16
Lab	2/64

Pre/Corequisites

WELD 1045 - Introduction to GTAW or equivalent from another technical college or instructor approval.

Institutional Core Competencies

Communication - Students will be able to demonstrate appropriate and effective interactions with others to achieve their personal, academic, and professional objectives.

Course Competencies

1. **Demonstrate how to obtain proper program on the GTAW pulse welders for the material being welded.**

   Learning Objectives

   Determine the correct GTAW-pulse waveform and frequency for the welding equipment in the lab, according to shielding gas, electrode diameter and type with the material being welded.
   Demonstrate how to select the correct program and adjust the waveform and frequency settings for each type of machine.
   Choose the correct filler rod and tungsten diameter for the material being welded.

2. **Set up equipment and supplies necessary to perform GTAW pulse on carbon steel, stainless steel, and aluminum.**

   Learning Objectives

   Choose proper polarity and filler rod to weld on specific base metals.

Utilize proper welding gases for the material being welded.

3. **Demonstrate GTAW- pulse concepts and techniques in creating quality weldments on ferrous and non ferrous material.**

Learning Objectives
Use the proper angle of the torch to the joint and direction of travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.
Apply GTAW - Pulse and frequency settings for the position and material being welded.
Perform proper weld sequencing to produce an acceptable visual weld.

4. **Examine each weld and determine if it is rejectable or an acceptable weld.**

Learning Objectives
Examine each weld looking for discontinues and defects.
Determine what caused the discontinuity or defect and fix the cause.

5. **Demonstrate proper fit-up between the welded piece to ensure an acceptable weld.**

Learning Objectives
Examine the fit-up between material after it has been tacked, break and re tack if fit-up is not acceptable.
Examine pipe bevel contour to ensure the proper fit up when coping pipe.

6. **Demonstrate the knowledge to troubleshoot machine issues and replace the parts as needed.**

Learning Objectives
Examine weld for soot left on material to determine if the weld is receiving enough and correct shielding gas.
Determine the correct steps to take if the arc will not start or stop with pedal.
Determine what is the cause if the tungsten will not stay in position in the GTAW torch.

7. **Demonstrate how to weld a 6G practice test for GTAW pulse on pipe.**

Learning Objectives
Create quality weld test with the pulse mode on stainless steel pipe.
Identify any causes of various welding defects; make necessary adjustments.

8. **Demonstrate how to weld a 1G, 2G, 3G and 4G practice test for ferrous and non-ferrous material.**

Learning Objectives
Practice all types of positions GTAW- pulse 1G, 2G, 3G, 4G, on carbon steel, stainless steel, and aluminum.
Construct final weld coupon for bend testing.

9. **Prepare a certification bend test coupon for GTAW - pulse in 1G, 2G, 3G and 4G on ferrous and non-ferrous material.**

Learning Objectives
Demonstrate how to cut, prepare and bend the test coupon.
Obtain the correct material to be used for the bend test according the weld procedure.

SCC Accessibility Statement

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room C-112, (507) 389-7222; Faribault: Room A-116, (507) 332-5847.

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