

Pacing Guide

Welding 2 (semester) Dual Credit

Week 1

Dual Credit -Students must perform these tasks to AWS specifications

A. SMAW – GROOVE WELDS WITH BACKING

Effective welders demonstrate appropriate groove welding skills. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Identify and explain groove welds. 2. Identify and explain groove welds with backing. 3. Set up shielded metal arc welding (SMAW) equipment for making V-groove welds. 4. Perform SMAW for V-groove welds with backing in the: • Flat (1G) position • Horizontal (2G) position • Vertical (3G) position • Overhead (4G) position

B. SMAW – OPEN V-GROOVE WELDS

Effective welders demonstrate appropriate knowledge and skills in using shielded metal arc welding for open V-groove welds. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Prepare shielded metal arc welding (SMAW) equipment for open-root V-groove welds. 2. Perform open-root V-groove welds in the: • Flat (1G) position • Horizontal (2G) position • Vertical (3G) position • Overhead (4G) position

Week 3

A. WELDING SYMBOLS

Effective welders demonstrate knowledge and use of welding symbols. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Identify and explain the various parts of a welding symbol. 2. Identify and explain fillet and groove weld symbols. 3. Read welding symbols on drawings, specifications, and welding procedure specifications. 4. Interpret welding symbols from a print. 5. Draw welding symbols based on the observation of actual welds.

B. READING WELDING DETAIL DRAWINGS

Effective welders demonstrate knowledge and skills for reading and interpreting welding detail drawings. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Identify and explain a welding detail drawing. 2. Identify and explain lines, material fills, and sections. 3. Identify and explain object views. 4. Identify and explain dimensioning. 5. Identify and explain notes and bill of materials. 6. Interpret basic elements of a welding detail drawing. 7. Develop basic welding drawings.

Week 4

C. GMAW AND FCAW – EQUIPMENT AND FILLER METALS

Effective welders demonstrate appropriate knowledge and use of gas metal arc and flux cored arc welding. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Explain gas metal arc welding (GMAW) and flux cored arc welding (FCAW) safety. 2. Explain the characteristics of welding current and power sources. 3. Identify and explain the use of GMAW and FCAW equipment: • Spray transfer • Globular • Short circuiting • Pulse 4. Identify and explain the use of GMAW and FCAW shielding gases and filler metals. 5. Set up GMAW and FCAW equipment and identify tools for weld cleaning

Week 5

D. GMAW AND FCAW – PLATE

Effective welders demonstrate appropriate knowledge and skills for gas metal arc and flux cored arc welding. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Perform GMAW multiple-pass fillet welds on plate, using solid or composite wire and shielding gas in multiple positions. 2. Perform GMAW multiple-pass open-root V-groove welds on plate, using solid or composite wire and shielding gas, in multiple positions. 3. Perform GMAW spray fillet and open-root V-groove welds on plate, using solid or composite wire and shielding gas, in flat and horizontal positions. 4. Perform FCAW multiple-pass fillet welds on plate in multiple positions using flux cored wire and, if required, shielding gas. 5. Perform FCAW multiple-pass open-root V-groove welds on plate in multiple positions using flux cored wire and, if required, shielding gas.

Week 7

WELDING – ADVANCED For schools with more classroom instructional hours, choose from the list of advanced standards.

A. SMAW – OPEN-ROOT PIPE WELDS

Effective welders demonstrate appropriate knowledge and skills in using shielded metal arc welding for open-root pipe welding. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Prepare shielded metal arc welding (SMAW) equipment for open-root V-groove pipe welds. 2. Identify and explain open-root V-groove pipe welds. 3. Perform SMAW for open-root welds in the: • Flat (1G-ROTATED) position • Horizontal (2G) position • Multiple (5G) position • Multiple inclined (6G) position

Week 9 GTAW-plate must also meet AWS specifications

B. GTAW – EQUIPMENT AND FILLER METALS

Effective welders demonstrate appropriate knowledge and skills for gas tungsten arc welding. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Explain gas tungsten arc welding (GTAW) safety. 2. Identify and explain the use of GTAW equipment. 3. Identify and explain the use of GTAW filler metals. 4. Identify and explain the use of GTAW shielding gases. 5. Set up GTAW equipment.

C. *GTAW – PLATE*

Effective welders demonstrate appropriate skills for creating multiple-pass open-root V-groove welds. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Build a pad in the flat position with stringer beads using GTAW and carbon steel filler metal. 2. Make multiple-pass open-root V-groove welds on carbon steel plate in the 1G (flat) position using GTAW and carbon steel filler metal. 3. Make multiple-pass open-root V-groove welds on carbon steel plate in the 2G (horizontal) position using GTAW and carbon steel filler metal. 4. Make multiple-pass open-root V-groove welds on carbon steel plate in the 3G (vertical) position using GTAW and carbon steel filler metal. 5. Make multiple-pass open-root V-groove welds on carbon steel plate in the 4G (overhead) position using GTAW and carbon steel filler metal.

Week 13

D. *GTAW – ALUMINUM PLATE*

Effective welders demonstrate appropriate knowledge and skills in using gas tungsten arc welding using aluminum plate. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Identify and explain aluminum metallurgy. 2. Explain and identify characteristics of aluminum. 3. Explain GTAW and set up equipment to weld aluminum plate. 4. Explain and practice GTAW techniques for plate, including padding in the flat position with stringer beads, using aluminum filler metal. 5. Make fillet welds on aluminum plate in the following positions: • 1F (flat) • 2F (horizontal) • 3F (vertical) • 4F (overhead) 6. Make multiple-pass V-groove welds with backing on aluminum plate in the following positions: • 1G (flat) • 2G (horizontal) • 3G (vertical) • 4G (overhead)

Week 14

E. *GAS TUNGSTEN ARC WELDING (GTAW) – CARBON STEEL PIPE*

Effective welders demonstrate appropriate knowledge and skills in using gas tungsten arc welding using carbon steel pipe. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Set up GTAW equipment. 2. Identify and explain open-root V-groove pipe weld techniques. 3. Perform open-root V-groove pipe welds using GTAW in the following positions: • 1G-ROTATED • 2G • 5G • 6G

Week 16

F. *GAS TUNGSTEN ARC WELDING (GTAW) – LOW-ALLOY AND STAINLESS-STEEL PIPE*

Effective welders demonstrate appropriate knowledge and skills in using gas tungsten arc welding using low-alloy and stainless-steel pipe. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Welding Technology program of study. 1. Set up GTAW equipment to perform stainless and/or low-alloy steel pipe welding. 2. Identify and explain open-root V-groove pipe weld techniques. 3. Perform open-root V-groove pipe welds using GTAW in the following positions: • 1G-ROTATED • 2G • 5G • 6G

