Western Technical College

31442303 Welding - Shielded Metal Arc (SMAW)

Course Outcome Summary

**Course Information**

| Description                                      | The study of welding techniques and applications for the flat and horizontal positions, to include electrode selection, fundamental joints, welding positions, and basic electricity for arc welding. |
| Career Cluster                                   | Manufacturing |
| Instructional Level                              | Technical Diploma Courses |
| Total Credits                                    | 2 |
| Total Hours                                      | 72 |

**Textbooks**


**Learner Supplies**

Welding sateen jacket, welding work gloves (long leather gauntlet, short leather work gloves), welding helmet, leather cape and sleeves. **Vendor**: To be discussed in class. Required.

Tools: 25' steel tape measure, metal combination square, and scribe. **Vendor**: To be discussed in class. Required.

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor**: Campus Shop. Required.

Six inch leather steel toed work books - $75.00-150.00. **Vendor**: To be discussed in class. Required.

**Program Outcomes**

1. Demonstrate industry recognized safety practices
2. Interpret welding drawings
3. Produce shielded metal arc welds (SMAW)
4. Perform thermal cutting

**Course Competencies**

1. Identify the basics of Shielded Metal Arc Welding (SMAW).
Assessment Strategies
1.1. Written Product

Criteria

You will know you are successful when
1.1. you identify the basic hardware components of an SMAW equipment setup
1.2. you describe how SMAW equipment components and electrodes, interact with base metal to deposit weld metal
1.3. you describe the meanings of the letters SMAW

Learning Objectives
1.a. Enumerate the basic hardware components of an SMAW equipment setup
1.b. Articulate how SMAW equipment components and electrodes, interact with base metal to deposit weld metal
1.c. State the meanings of the letters SMAW

2. Explain the electrical concepts involved with SMAW.

Assessment Strategies
2.1. Written Product

Criteria

You will know you are successful when
2.1. you describe the volt/amp curve for SMAW
2.2. you illustrate how welding technique affects voltage and amperage
2.3. you explain the meaning of duty cycle
2.4. you list causes and responses to arc blow

Learning Objectives
2.a. Examine the volt/amp curve for SMAW
2.b. Examine how welding technique affects voltage and amperage
2.c. Examine the meaning of duty cycle
2.d. Examine the causes and responses to arc blow

3. Apply safety procedures in equipment setup and use.

Assessment Strategies
3.1. Skill Demonstration

4. Examine electrode selection for various applications.

Assessment Strategies
4.1. Written Product

Criteria

You will know you are successful when
4.1. you identify the 4 filler groups
4.2. you recite what the alpha-numeric meanings are of the EXXXX designations are
4.3. you describe how electrode numbers, filler group designations, and weld positions relate to each other
4.4. you recite the specific application(s) of low hydrogen electrodes, and how they must be stored to be effective

Learning Objectives
4.a. Examine the 4 filler groups
4.b. Recite what the alpha-numeric meanings are of the EXXXX designations are
4.c. Examine how electrode numbers, filler group designations, and weld positions relate to each other
4.d. Recite the specific application(s) of low hydrogen electrodes, and how they must be stored to be effective

5. Identify the various joint positions and joint preparations.
Assessment Strategies
5.1. Written Product

Criteria
You will know you are successful when
5.1. you identify the 5 joint types
5.2. you name various joint preparations
5.3. you sketch various joints in the 4 welding positions
5.4. you explain the difference between a joint type and a weld type

Learning Objectives
5.a. Examine the 5 joint types
5.b. Identify names for various joint preparations
5.c. sketch various joints in the 4 welding positions
5.d. Examine the difference between a joint type and a weld type

6. Identify appropriate techniques to prevent or minimize distortion.

Assessment Strategies
6.1. Written Product

7. Produce SMAW welds in the flat positions with various electrodes.

Assessment Strategies
7.1. Skill Demonstration

Learning Objectives
7.a. Demonstrate use of E6013, E6010, and E7018 to stringer beads, weave beads, square groove joints, and lap joints in the flat position

8. Produce SMAW welds in the horizontal position with various electrodes.

Assessment Strategies
8.1. Skill Demonstration

Learning Objectives
8.a. Demonstrate use of E6010, E6011, E7018, and E7024 to groove, and T-joints in the horizontal position.