



Western Technical College

31442313 Welding - Shielded Metal Arc 2 (SMAW)

Course Outcome Summary

Course Information

Description	The study of welding techniques and applications for the vertical and overhead positions, to include welding metallurgy, metal properties, identification, effects of heat, pre and post weld heat treatments.
Career Cluster	Manufacturing
Instructional Level	Technical Diploma Courses
Total Credits	2
Total Hours	72

Pre/Corequisites

Pre/Corequisite 31442303 Welding - SMAW 1

Textbooks

No textbook required.

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.

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

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** Campus Shop. 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. Produce fillet welds in vertical position for various joints using SMAW techniques.

Assessment Strategies

- 1.1. Demonstration

Criteria

You will know you are successful when

- 1.1. you follow PPE and safety regulations.
- 1.2. you perform weld inspection.
- 1.3. you produce welds that meet the minim acceptance criteria on 3F on joints.
- 1.4. you select the correct electrode.

Learning Objectives

- 1.a. Explore hand motion and weld puddle manipulation technique for SMAW.
- 1.b. Identify how work and travel angles influence the shape of the weld.
- 1.c. Describe how work and travel angles change depending on weld position and joint design.
- 1.d. Practice a variety of fillet welds using appropriate electrodes.
- 1.e. Practice multi-pass welds.

2. Produce groove welds in vertical positions for various joints using SMAW techniques.

Assessment Strategies

- 2.1. Demonstration

Criteria

You will know you are successful when

- 2.1. you follow PPE and safety regulations.
- 2.2. you select the correct electrode.
- 2.3. you produce welds that meet the minim acceptance criteria on 3G on joints.
- 2.4. you perform weld inspection.

Learning Objectives

- 2.a. Explore hand motion and weld puddle manipulation technique for SMAW.
- 2.b. Identify how work and travel angles influence the shape of the weld.
- 2.c. Describe how work and travel angles change depending on weld position and joint design.
- 2.d. Practice a variety of groove welds using appropriate electrodes.
- 2.e. Practice multi-pass welds.

3. Produce fillet welds in overhead position for various joints using SMAW techniques.

Assessment Strategies

- 3.1. Demonstration

Criteria

You will know you are successful when

- 3.1. you follow PPE and safety regulations.
- 3.2. you select the correct electrode.
- 3.3. you produce welds that meet the minim acceptance criteria on 4F on joints.
- 3.4. you perform weld inspection.

Learning Objectives

- 3.a. Explore hand motion and weld puddle manipulation technique for SMAW.
- 3.b. Identify how work and travel angles influence the shape of the weld.
- 3.c. Describe how work and travel angles change depending on weld position and joint design.
- 3.d. Practice a variety of fillet welds using appropriate electrodes.
- 3.e. Practice multi-pass welds.

4. Produce groove welds in overhead positions for various joints using SMAW techniques.

Assessment Strategies

- 4.1. Demonstration

Criteria

You will know you are successful when

- 4.1. you follow PPE and safety regulations.
- 4.2. you select the correct electrode.
- 4.3. you produce welds that meet the minim acceptance criteria on 4G on joints.
- 4.4. you perform weld inspection.

Learning Objectives

- 4.a. Explore hand motion and weld puddle manipulation technique for SMAW.
- 4.b. Identify how work and travel angles influence the shape of the weld.
- 4.c. Describe how work and travel angles change depending on weld position and joint design.
- 4.d. Practice a variety of groove welds using appropriate electrodes.
- 4.e. Practice multi-pass welds.

5. Produce a 2G pipe weld using SMAW techniques.

Assessment Strategies

- 5.1. Demonstration

Criteria

You will know you are successful when

- 5.1. you follow PPE and safety regulations.
- 5.2. you produce welds that meet the minim acceptance criteria on 2G on pipe
- 5.3. you perform weld inspection.
- 5.4. you select the correct electrode.

Learning Objectives

- 5.a. Explore hand motion and weld puddle manipulation technique for SMAW.
- 5.b. Identify how work and travel angles influence the shape of the weld.
- 5.c. Describe how work and travel angles change depending on weld position and joint design.
- 5.d. Practice a variety of groove welds using appropriate electrodes on pipe.
- 5.e. Practice multi-pass welds.

6. Examine Weld Procedure Specifications (WPS) sheets for information specific to SMAW welds.

Assessment Strategies

- 6.1. Demonstration

Criteria

You will know you are successful when

- 6.1. you select correct material based on the WPS.
- 6.2. you set up correct joint, type, and position of a weld from a WPS.
- 6.3. you set up welding station to perform weld(s) identified on the the WPS.
- 6.4. you produce weld(s) according to the WPS.

6.5. you inspect welds to verify accuracy according to the WPS.

Learning Objectives

- 6.a. Identify each of the following information that might be on a WPS: code, welding process, base metal grade, filler metal classification, amperage range, shielding gas composition, and pre-heat and interpass temperatures, etc.
- 6.b. Identify materials needed to complete a weld based on the form.
- 6.c. Identify joint and position from the form.
- 6.d. Identify process from the form.
- 6.e. Identify consumables from the form.