Western Technical College

31442323 Welding - Shielded Metal Arc 3 (SMAW)

Course Outcome Summary

Course Information

Description	The study of welding techniques and applications using the shielded metal arc welding process on pipe in the 5 and 6 positions with and without backing.
Career Cluster	Manufacturing
Instructional Level	Technical Diploma Courses
Total Credits	2
Total Hours	72

Textbooks

Modern Welding – with Access. 12th Edition. Copyright 2020. Althouse, Andrew D., Carl H. Turnquist, and William A. Bowditch. Publisher: Goodheart-Wilcox Co. **ISBN-13:** 978-1-63563-913-1. 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 books - $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. Summarize fit up and joint preparation for pipe welding.

Assessment Strategies

1.1. Skill Demonstration

Criteria

You will know you are successful when:

1.1. you reference the WPS guidelines.
1.2. you locate correct material thickness and shear to size.
1.3. you meet weld quality as per AWS D1.1 or D1.3.
1.4. you wear PPE and follow all safety guidelines.
1.5. you set up, shut down, and maintain equipment and work area.
1.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives

1.a. Illustrate the parts of the weld, including the angles and how they are measured.
1.b. Explore techniques to achieve the desired weld.
1.c. Identify the application of the weld.
1.d. Examine the acceptance criteria for a completed weld.

2. Weld 2G sch 80 pipe open root, E6010 root, E7018 fill and covers.

Assessment Strategies

2.1. Skill Demonstration

Criteria

You will know you are successful when

2.1. you reference the WPS guidelines.
2.2. you locate correct material thickness and shear to size.
2.3. you meet weld quality as per AWS D1.1 or D1.3.
2.4. you wear PPE and follow all safety guidelines.
2.5. you set up, shut down, and maintain equipment and work area.
2.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives

2.a. Illustrate the parts of the weld, including the angles and how they are measured.
2.b. Explore techniques to achieve the desired weld.
2.c. Identify the application of the weld.
2.d. Examine the acceptance criteria for a completed weld.

3. Weld 5G sch 80 pipe, Uphill E6010 root, Uphill E 7018 fill and cover.

Assessment Strategies

3.1. Skill Demonstration

Criteria

You will know you are successful when

3.1. you reference the WPS guidelines.
3.2. you locate correct material thickness and shear to size.
3.3. you meet weld quality as per AWS D1.1 or D1.3.
3.4. you wear PPE and follow all safety guidelines.
3.5. you set up, shut down, and maintain equipment and work area.
3.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives

3.a. Illustrate the parts of the weld, including the angles and how they are measured.
3.b. Explore techniques to achieve the desired weld.
3.c. Identify the application of the weld.
3.d. Examine the acceptance criteria for a completed weld.

4. Weld 6G sch 80 pipe, Uphill root, Uphill cover passes E6010 root, E7018 fill and covers.

Assessment Strategies

4.1. Skill Demonstration

Criteria

You will know you are successful when

4.1. you reference the WPS guidelines.
4.2. you locate correct material thickness and shear to size.
4.3. you meet weld quality as per AWS D1.1 or D1.3.
4.4. you wear PPE and follow all safety guidelines.
4.5. you set up, shut down, and maintain equipment and work area.
4.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives

4.a. Illustrate the parts of the weld, including the angles and how they are measured.
4.b. Explore techniques to achieve the desired weld.
4.c. Identify the application of the weld.
4.d. Examine the acceptance criteria for a completed weld.

5. Weld cast iron using various methods and processes.

Assessment Strategies

5.1. Skill Demonstration
5.2. Written Objective Test

Criteria

You will know you are successful when:

5.1. you name three main types of cast irons, including their use in industry.
5.2. you identify materials by chemical and physical characteristics.
5.3. you describe the various welding techniques used in the joining of materials.
5.4. you identify solutions for repair and maintenance using these materials.

Learning Objectives

5.a. Evaluate material characteristics in determining the base metal composition for welding.
5.b. Evaluate methods or processes that could be used based on situational needs for the weld.
5.c. Illustrate the parts of the weld, including the angles and how they are measured.
5.d. Explore techniques to achieve the desired weld.
5.e. Identify the application of the weld.
5.f. Examine the acceptance criteria for a completed weld.