



Western Technical College

32442327 Welding – Heavy Equipment Fabrication

Course Outcome Summary

Course Information

Description	This course is designed to provide basic welding training in the area of minor repairs and fabrication for diesel and heavy equipment technicians.
Career Cluster	Manufacturing
Instructional Level	Technical Diploma Courses
Total Credits	2
Total Hours	72

Pre/Corequisites

Prerequisite 32442317 Welding - Transportation

Textbooks

No textbook required.

Learner Supplies

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** To be discussed in class. Required.

Six inch ankle high, quality leather work shoes - \$75.00-100.00. **Vendor:** To be discussed in class. Required.

Welding sateen jacket, welding work gloves, welding helmet - \$80.00. **Vendor:** To be discussed in class. Required.

Success Abilities

1. Cultivate Passion: Enhance Personal Connections
2. Cultivate Passion: Expand a Growth-Mindset
3. Cultivate Passion: Increase Self-Awareness
4. Live Responsibly: Embrace Sustainability
5. Refine Professionalism: Improve Critical Thinking
6. Refine Professionalism: Participate Collaboratively
7. Refine Professionalism: Practice Effective Communication

Course Competencies

1. Examine short circuit GMAW.

Assessment Strategies

- 1.1. Skill Demonstration

Criteria

You will know you are successful when

- 1.1. you set-up the weld station to perform a GMAW weld.
- 1.2. you weld a lap joint in the horizontal position using GMAW processes.
- 1.3. you weld a t-joint in the flat position using GMAW processes.
- 1.4. you weld in the vertical position using GMAW processes.
- 1.5. you weld in the overhead position using GMAW processes.
- 1.6. you clean up area after welding.

Learning Objectives

- 1.a. Review welding equipment setup.
- 1.b. Weld various joints in various positions using GMAW processes.
- 1.c. Identify safety concerns and precautions for GMAW welding.

2. Demonstrate SMAW in vertical and overhead positions.

Assessment Strategies

- 2.1. Skill Demonstration

Criteria

You will know you are successful when

- 2.1. you setup equipment for SMAW welding.
- 2.2. you weld a vertical fillet weld in a t-joint or lap joint in the upward progression.
- 2.3. you weld a vertical fillet weld in the downhill progression
- 2.4. you weld an overhead fillet weld in a t-joint or lap joint.
- 2.5. you weld an overhead groove weld
- 2.6. you clean up area when finished.

Learning Objectives

- 2.a. Identify different types of welding rods based on codes.
- 2.b. Identify purpose of each rod type.
- 2.c. Practice techniques for vertical welding (body positioning, electrode movement, etc.)
- 2.d. Practice techniques for overhead welding (body positioning, electrode movement, etc.).
- 2.e. Explore the five different joints used in welding materials together (emphasis on t-joints).
- 2.f. Explore two types of welds (emphasis on fillet welds).
- 2.g. Examine destructive testing for fillet welds.
- 2.h. Identify safety concerns and precautions for SMAW welding.

3. Demonstrate metal core spray transfer GMAW.

Assessment Strategies

3.1. Skill Demonstration

Criteria

You will know you are successful when

- 3.1. you set up the welding station to perform a GMAW weld.
- 3.2. you weld in the horizontal position using GMAW processes.
- 3.3. you weld in the flat position using GMAW processes.
- 3.4. you weld in the overhead position using GMAW processes.
- 3.5. you clean up the area after welding.

Learning Objectives

- 3.a. Review welding equipment setup.
- 3.b. Weld various joints in various positions using GMAW processes.
- 3.c. Identify safety concerns and precautions for GMAW welding.

4. Demonstrate FCAW in vertical and overhead positions.

Assessment Strategies

- 4.1. Skill Demonstration

Criteria

You will know you are successful when

- 4.1. you setup equipment for FCAW welding.
- 4.2. you weld a vertical groove weld in a butt joint in the upward progression.
- 4.3. you weld an overhead groove weld in a butt joint.
- 4.4. you clean up area when finished.

Learning Objectives

- 4.a. Identify different types of welding wire based on codes.
- 4.b. Identify purpose of each wire type.
- 4.c. Practice techniques for vertical welding (body positioning, electrode movement, etc.)
- 4.d. Practice techniques for overhead welding (body positioning, electrode movement, etc.).
- 4.e. Explore the five different joints used in welding materials together (emphasis on butt joints).
- 4.f. Explore two types of welds (emphasis on groove welds).
- 4.g. Examine destructive testing for groove welds.
- 4.h. Identify safety concerns and precautions for FCAW welding.

5. Examine aluminum GMAW with a spool gun and/or push-pull gun.

Assessment Strategies

- 5.1. Skill Demonstration

Criteria

You will know you are successful when

- 5.1. you setup equipment for GMAW welding.
- 5.2. you demonstrate aluminum GMAW with a spool gun and/or push-pull gun..
- 5.3. you clean up area when finished.

Learning Objectives

- 5.a. Identify differences between aluminum and steel.
- 5.b. Practice welds on aluminum with a spool gun and/or push-pull gun..
- 5.c. Identify safety concerns and precautions for GMAW welding.

6. Perform carbon air arc gouging.

Assessment Strategies

- 6.1. Skill Demonstration

Criteria

You will know you are successful when

- 6.1. you setup equipment for carbon arc gouging.
- 6.2. you demonstrate ability to remove material using a carbon arc.

6.3. you clean up area when finished.

Learning Objectives

- 6.a. Examine equipment setup for arc gouging.
- 6.b. Examine purpose of (or when to) arc gouging.
- 6.c. Practice carbon air arc gouging.
- 6.d. Identify safety concerns and precautions for arc gouging.

7. Braze weld mild steel and cast iron.

Assessment Strategies

- 7.1. Skill Demonstration

Criteria

You will know you are successful when

- 7.1. you setup equipment for brazing.
- 7.2. you prep cast iron properly.
- 7.3. you prep mild steel properly.
- 7.4. you weld two pieces together with a braze.
- 7.5. you clean up area when finished.

Learning Objectives

- 7.a. Identify characteristics of cast iron.
- 7.b. Examine methods for joining cast iron.
- 7.c. Examine methods for joining mild steel.
- 7.d. Explore equipment set up for braze welding.
- 7.e. Examine the different types of brazing/soldering rods.
- 7.f. Practice braze welding.
- 7.g. Identify safety concerns and precautions for braze welding.