Western Technical College

31442322  Welding - Fabrication 3

Course Outcome Summary

Course Information

Description: A course of instruction to include precision layout with the use of rulers/scales, hand tools, operation of the press brake, use of flame tracer, welding joint designs, shearing and sawing materials, grinders and belt sanders. Assemble projects by various welding processes with the use of blueprint symbols and welding procedure specifications working with stainless steel and aluminum.

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.

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


Experiential Learning

1. Community Based Learning Project

Program Outcomes

1. Demonstrate industry recognized safety practices
2. Interpret welding drawings
3. Produce shielded metal arc welds (SMAW)
4. Produce gas metal arc welds (GMAW)
5. Produce flux core welds
6. Produce gas tungsten arc welds (GTAW)
7. Perform thermal cutting

Course Competencies

1. **Construct Stainless Steel Weldment**

   Assessment Strategies
   1. using safety issues.
   2. using notes taken in class text and video.
   3. reading and using lab sheet.
   4. using previous cutting and welding skills in a safe lab environment.

   Criteria
   *Criteria - Performance will be satisfactory when:*
   1. learner will demonstrate use of plasma cutting, shear and press brake.
   2. learner will weld stainless steel with GTAW and/or GMAW process to achieve sound smooth welds.
   3. learner will construct and weld with a 95% proficiency.
   4. learner will fill all joints completely.
   5. learner will have assigned amount of time depending on difficulty of project.
   6. learner will understand acceptable weld quality according to AWS D1.1.

   Learning Objectives
   1.a. Set up press brake using correct punch and die.
   1.b. Calculate bend allowances.
   1.c. Form parts by air bending to tolerances +/- 1/16”.
   1.d. Shearing/cutting to exact dimensions.
   1.e. Use multiple welding processes when needed.
   1.f. Grind and polish welds to mirror finish.
   1.g. Shut down equipment.
   1.h. Clean up area.

2. **Construct Aluminum Weldment**

   Assessment Strategies
   1. using safety issues.
   2. using notes taken in class text and video.
   3. reading and using lab sheet.
   4. using previous cutting and welding skills in a safe lab environment.

   Criteria
   *Criteria - Performance will be satisfactory when:*
   1. learner will demonstrate tacking and welding aluminum with GTAW and/or GMAW processes.
   2. learner will construct project to tolerances given on blueprints.
   3. learner will construct project in assigned time based on size and difficulty.
   4. learner will construct and weld with a 95% proficiency.
   5. learner will fill joints completely.
   6. learner will understand acceptable weld quality according to AWS D1.1.

   Learning Objectives
   2.a. Use of shearing, sawing and cutting of aluminum.
   2.b. Constructing to tolerances of +/- 16”.
   2.c. Correct size and location of tacks.
2.d. Critical cleaning of aluminum material.
2.e. Demonstrate good starts and stops of welds.
2.f. Understand thermal conductivity of aluminum.

3. **Weld and Fabricate Mild Steel**

**Assessment Strategies**

3.1. using safety issues.
3.2. using notes taken in class text and video.
3.3. reading and using lab sheet.
3.4. using previous cutting and welding skills in a safe lab environment.

**Criteria**

*Criteria - Performance will be satisfactory when:*

3.1. learner will demonstrate cutting, shearing, sawing and forming as needed.
3.2. learner will demonstrate use of previous weld skills and choose correct welding process.
3.3. learner will demonstrate the use of sketches and blueprints.
3.4. learner will complete with 100% proficiency.
3.5. learner will have assigned time depending on difficulty.
3.6. learner will understand acceptable quality of welds according to AWS D1.1.

**Learning Objectives**

3.a. Use of clamps, squares and fixtures.
3.b. Proper sequence of tacking.
3.c. Size of tacks.
3.d. Proper sequence of welding.
3.e. Brushing and cleaning of finished welds.
3.f. Working with tolerances of +/- 1/16”.
3.g. Use of blueprint symbols.
3.h. Constructing a project that is salable.
3.i. Clean up area.

4. **Develop Weld Procedure on Mild Steel**

**Assessment Strategies**

4.1. using safety issues.
4.2. using notes taken in class text and video.
4.3. reading and using lab sheet.
4.4. using previous cutting and welding skills in a safe lab environment.

**Criteria**

*Criteria - Performance will be satisfactory when:*

4.1. learner will demonstrate use of welding procedure specification.
4.2. learner will construct and weld joint completely filled.
4.3. learner will follow AWS D1.1 code with a 100% proficiency.
4.4. learner will cut and bend weld coupons according to D1.1 code.
4.5. learner will understand how to inspect bends.
4.6. learner will have 1-5 hour lab to complete.

**Learning Objectives**

4.a. Follow written WPS which students has completed.
4.b. Use blueprint symbols.
4.c. Choose correct welding process.
4.e. Inspect for defects.
4.f. Fill out appropriate paperwork.
4.g. Clean up area.