Western Technical College

31457330 Fabrication Welding 3

Course Outcome Summary

Course Information

Description	Introduces factors for working with non-steel materials. Primarily a capstone course allowing students to fabricate their own projects assembled using welding procedures the student develops.
Career Cluster	Manufacturing
Instructional Level	Technical Diploma Courses
Total Credits	2
Total Hours	72

Pre/Corequisites

Pre/Corequisite	31457320 Fabrication Welding 2
Pre/Corequisite	31442325 Welding - TIG 2
Prerequisite	31442316 Wirefeed Welding 2

Textbooks

Modern Metalworking. 11th Edition. Copyright 2023. Walker, John R. Publisher: Goodheart-Wilcox Co. **ISBN-13:** 978-1-64925-983-7. 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.

High Impact Practices

1. Capstone Experience: in this course, you will develop a project that integrates and applies many of the concepts, skills, and characteristics needed of an industry expert in the field.
2. Community Builder: A community based learning experience wherein student connect academic learning and civic development while simultaneously addressing a community partner's needs, interests, or problems (i.e. Service Learning Projects)
3. Community Explorer: a community based learning opportunity where in students have opportunities in the program to learn more about community partners (ex: Employer Spotlights, Job Shadows, Professional Associations, Community Action Boards, etc.)

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
8. Apply welding metallurgy and inspection techniques.

Course Competencies

1. Operate CNC thermal shape cutter

Assessment Strategies

1.1. Skill Demonstration

Criteria

You will know you are successful when

1.1. you power up and operate the CNC plasma table, including all the subsystems required for it to perform.
1.2. you load the table with stock material.
1.3. you cut a part correctly using a offline program or a shape library program with an efficient use of material.
1.4. you are able to develop and prepare through programming a geometric shape for cutting.

Learning Objectives

1.a. Use safety equipment.
1.b. Learn controls on CNC plasma table.
1.c. Identify how the different types and thicknesses of material affect the method of cutting.
1.d. Position stock material and cutting head correctly
1.e. Examine plasma and oxyfuel torch part assembly.
1.f. Set up plasma power supply or gas pressures.

1.g. Check for correct tip size for the appropriate material thickness.
1.h. Perform proper part cleanup

2. Weld and Fabricate Mild Steel.

Assessment Strategies

2.1. using safety issues.
2.2. using notes taken in class text and video.
2.3. reading and using lab sheet.
2.4. using previous cutting and welding skills in a safe lab environment.

Criteria

You will know you are successful when

2.1. you demonstrate cutting, shearing, sawing and forming as needed.
2.2. you demonstrate use of previous weld skills and choose correct welding process.
2.3. you demonstrate the use of sketches and blueprints.
2.4. you complete with 100% proficiency.
2.5. you understand acceptable quality of welds according to AWS D1.1.

Learning Objectives

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

3. Develop Weld Procedure on 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 prevoius cutting and welding skills in a safe lab environment.

Criteria

You will know you are successful when

3.1. you demonstrate use of welding procedure specification.
3.2. you construct and weld joint completely filled.
3.3. you follow AWS D1.1 code with a 100% proficiency.
3.4. you cut and bend weld coupons according to D1.1 code.
3.5. you inspect bends.

Learning Objectives

3.a. Follow written WPS which students has completed.
3.b. Use blueprint symbols.
3.c. Choose correct welding process.
3.d. Grind, polish and bend coupons.
3.e. Inspect for defects.
3.f. Fill out appropriate paperwork.
3.g. Clean up area.

4. Maximize stock material.

Assessment Strategies

4.1. Activity

Criteria

You will know you are successful when

4.1. you use software to produce cut lists that efficiently uses stock material sizes.
4.2. you calculate square footage of materials needed
4.3. you apply calculations to produce cut lists that efficiently utilize stock material sizes.

Learning Objectives

4.a. Determine stock lengths and sizes.
4.b. Saw or plasma kerf.
4.c. Limit waste material.
4.d. Use linear maximization nesting software.
4.e. Use sheet nesting software.
4.f. Manually nest parts.

5. Fabricate final product based on Fab 2 Project plans.