Western Technical College

31457320 Fabrication Welding 2

Course Outcome Summary

Course Information

Description	A course of instruction to include introducing the CNC cutting table and press brake. It continues advancing techniques, tools, and equipment from Fabrication 1. Introduces weldment design considerations. Assemble projects by various welding processes with the use of blueprint symbols.
Career Cluster	Manufacturing
Instructional Level	Technical Diploma Courses
Total Credits	2
Total Hours	72

Pre/Corequisites

Prerequisite	31442315 Welding - TIG 1
Pre/Corequisite	31442313 Welding - SMAW 2
Prerequisite	31442306 Wirefeed Welding 1
Prerequisite	31457310 Fabrication Welding 1

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. 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)
2. 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.)
3. Work-Based Learning: this course applies your learning to your desired profession by working in industry placements (such as internships, practicums, clinicals, or co-ops), developing career related documents (ex: resume, job applications, cover letters), or connecting with potential employers (ex: job shadows, interviews, job fairs).

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. Develop bill of materials.

Assessment Strategies

1.1. Activity

Criteria

You will know you are successful when

1.1. you parse a blueprint in order to identify all of the different materials used in fabrication of the project.
1.2. you organize the materials into a bill of materials list.
1.3. you identify and differentiate different types of Structural Shapes
1.4. you identify and differentiate different fasteners.

Learning Objectives

1.a. Identify structural shapes of materials.
1.b. Identify fasteners

1.c. Identify part numbers or other defining features.
1.d. Start a list of various parts and their materials and refine it until everything is grouped by size, shape, and length and accounted for.

2. Operate Victory Plasma Table/CNC Thermal shape cutter.

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 prevoius cutting and welding skills in a safe lab environment.

Criteria

You will know you are successful when

2.1. you demonstrate how to program CNC flame machine by use of pattern.
2.2. you cut programmed part with plasma cutting process.

Learning Objectives

2.a. Change of components of torch head.
2.b. Set up of plasma cutting equipment.
2.c. Program CNC to achieve cut part to proper size.
2.d. Understand cutting speeds.
2.e. Shut down equipment.
2.f. Clean-up area.

3. Operate Press Brake.

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

You will know you are successful when

3.1. you demonstrate use of 8' hydraulic press brake.
3.2. you demonstrate the calculations of bend allowances.
3.3. you air bend at 100% proficiency on mild steel to given specifications.

Learning Objectives

3.a. Set up press brake using proper punch and die.
3.b. Figure bend allowances.
3.c. Shear and square mild steel to proper size.
3.d. Layout for bending.
3.e. Perform accurate bends to given degrees assigned.

4. Fabricate 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 prevoius cutting and welding skills in a safe lab environment.

Criteria

You will know you are successful when

4.1. you demonstrate the construction of mild steel projects.
4.2. you demonstrate previous learned weld skills.
4.3. you understand acceptable weld quality.
4.4. you understand tolerances of welding fabrication according to AWS D1.1.

Learning Objectives

4.a. Set up of various clamps.

4.b. Proper sequence of tacking.
4.c. Maintaining squareness and tolerances +/- 1/16".
4.d. Clean-up weld when completed.
4.e. Shut down weld equipment.
4.f. Clean up area.

5. Draft plans for fabrication project.

Assessment Strategies

5.1. Written Product

Criteria

You will know you are successful when

5.1. you describe the purpose of the project / item you will be fabricating.
5.2. you create or modify a blueprint for your project.
5.3. you complete a cut list for your project.
5.4. you create a bill of materials for your project.
5.5. you describe or list the weld procedures need for the project.
5.6. you develop a timeline to complete project in Fabrication 3.

Learning Objectives

5.a. Explore sculptures and other objects created from metals.
5.b. Identify functional or artistic project to complete.
5.c. Examine the various blueprints, cut lists, and procedures needed to complete project.

6. Perform carbon arc cutting.

Assessment Strategies

6.1. Skill Demonstration

Criteria

You will know you are successful when

6.1. You verify the working environment is safe
6.2. You setup the carbon-arc cutting equipment correctly
6.3. You operate the carbon-arc cutting equipment following industry standards
6.4. You shut down the carbon-arc cutting equipment correctly.
6.5. You demonstrate proper cutting angle techniques for the application.
6.6. You verify that equipment is functioning correctly (i.e. air hose, cable connections, torch head, etc.)

Learning Objectives

6.a. Identify capacity of the carbon arc cutting equipment.
6.b. Identify components of the carbon arc cutting equipment.
6.c. Follow safety regulations for carbon arc cutting.
6.d. Verify cutting and torch head angle prior to cut.
6.e. Identify application for using carbon arc cutting.
6.f. Use carbon arc cutting for metal removal operations.