LUNA COMMUNITY COLLEGE

Welding Program
Curriculum Profile
2015-2018

LEARNING OUTCOMES COMPETENCIES

Program Goal:

The program prepares students with entry-level job skills in all phases of the welding industry and provides upgrading for those out in the field that need to acquire additional skills. Emphasis is placed on welding procedures used in the construction industry. Preparation for state certification is covered through the American Welders Society (AWS). Completion of this certificate can be applied toward the Associate of Applied Science Degree in Vocational/Technical Studies.

Institutional Proficiency Requirements
In addition to the courses listed below for this program of study, students must also complete institutional proficiencies of ENG095, MATH075 and READ095 that are outlined on page XX to meet all graduation requirements.

Certificate Requirements Credit Hours: 31
Program Requirements (25 hours)
VOC109 Fundamentals of Vocational Education 4
VOC117 Blueprint Reading and Construction Math 4
WLDG105 Introduction to Welding 3
WLDG118 Welding Level I 3
WLDG119 Welding Level I Application 4
WLDG211 Welding Level II 3
WLDG230 Welding Level III 4

Related Studies (6 hours)
WLDG133 Pipe and Plate Code Testing 4
WLDG140 Advanced Layout and Fabrication 3
WLDG148 Ornamental Art Welding 3

Course Learning Outcomes

WLDG 105: INTRODUCTION TO WELDING

This course teaches the fundamentals in the welding processes, shop orientation, and shop safety. Start with oxy/acetylene cutting and welding, and advance into basic MIG,TIG, and stick welding. Plasma cutting will be introduced. Welding will be tested in the flat, horizontal, vertical and overhead positions. Practical applications are covered and pipe welding will be introduced.

LEARNING OUTCOMES

1. Identify some of the common hazards in welding.

2. Explain and identify proper personal protection used in welding.
3. Describe how to avoid welding fumes.
4. Explain some of the causes of welding accidents.
5. Identify and explain uses for material data safety sheets
6. Explain safety techniques for storing and handling bottles.
7. Explain how avoid electrical shock while welding.
8. Identify and explain the use of oxy/fuel cutting equipment.
9. Set up oxy/fuel equipment.
10. Light and adjust an oxy/fuel torch.
11. Proper shut down of bottles.
12. Change cylinders
13. Perform oxy/fuel cutting and welding procedures.

WLDG118: WELDING LEVEL ONE

This course is the first level in the welding program. It is designed for the apprentice welder and teaches the basics in blueprinting, layout, and fabrication, pipe fitting and proper joint design necessary for various welding processes will be covered.

LEARNING OUTCOMES

1. Explain the plasma arc cutting processes.
2. Identify plasma arc cutting equipment.
3. Prepare and set up plasma arc cutting equipment.
4. Use plasma arc cutting equipment to make various types of cuts.
5. Identify and explain (SMAW) safety.
6. Explain welding electrical current.
7. Identify welding power supplies and their characteristics.
8. Explain how to set up a welding machine
9. Identify factors that affect electrode selection.
10. Identify different types of filler material.
11. Identify and select the proper electrode for a specified welding task.
12. Begin building a portfolio complete with blueprints, materials list, and pictures of completed projects.

Objectives: Air Carbon ARC Cutting and Gouging

1. Identify and explain the air carbon arc cutting (CAC-A) process an equipment.
2. Select and install CAC-A electrodes.

3. Prepare the work area and CAC-A equipment for safe operation.
4. Use CAC-A equipment for washing and gouging activities.
5. Perform storage and housekeeping activities for CAC-A equipment.
6. Make minor repairs to CAC-A equipment.

WLDG119: WELDING LEVEL ONE APPLICATION

Basic metallurgy will be covered by using numbering systems to identify metals and conduct magnet, spark, and chisel tests to identify metals. The use of manufacturing equipment and assembly procedures, along with advanced welding theory and applications are covered. Surface padding will be introduced.

LEARNING OUTCOMES

1. Clean base metal for welding or cutting
2. Identify and explain joint design.
3. Explain joint design considerations.
4. Mechanically bevel the edge fo a mild steel plate.
5. Thermally bevel the end of a mild steel plate.
6. Select the proper joint design based on a welding procedure specification (WPS) or instructor direction.

WLDG 211: WELDING LEVEL TWO

Designed to give the intermediate welder additional time to develop specific welding skills. Students will engage in field work and receive on the job training. Shop time will be dedicated to projects and working towards AWS certification.

LEARNING OUTCOMES

1. Identify factors that affect electrode selection.
2. Explain the American Welding Society (AWS) and the American Society of Mechanical Engineers (ASME) filler metal classification system.
3. Identify different types of filler metals.
4. Explain the storage and control of filler metal.
5. Explain filler metal traceability requirements and how to use applicable code requirements.
6. Identify and select the proper electrode for and identified welding task.

WLDG 230: WELDING LEVEL THREE

This course is designed for the advanced welder and is the capstone class for the welding graduate. Course content will be based on NCCER welding applications. Students will prepare and submit coupons for the American welding society (AWS) certification test. Students will also submit a portfolio of completed projects including pictures, blueprints, and materials list. Job search and job placement are also emphasized.

LEARNING OUTCOMES

1. Identify and explain codes governing welding.
2. Identify and explain nondestructive examination practices.
3. Identify and explain nondestructive examination practices.
4. Identify and explain welder qualification tests.
5. Explain the importance of quality workmanship.
6. Identify common destructive testing methods.
7. Performa visual inspection of fillet welds.

WLDG 133: PIPE AND PLATE CODE TESTING

This course demonstrates the ability to weld beveled test plate with and without backing strip in the horizontal, vertical, and overhead position according to applicable welding standards.

LEARNING OUTCOMES

1. Identify and explain job code specifications.
2. Use fit-up gauges and measuring devices to check joint fit-up.
3. Identify and explain distortion and how it is controlled.
4. Fit up joints using plate and pipe fit-up tools.
5. Check for joint misalignment and poor fit-up before and after welding.

WLDG 140: ADVANCED LAYOUT AND FABRICATION

This course includes the proper joint design, layout techniques, and fabrication methods required of a welder. In this course, students will also study the care and use of equipment, safety in the welding industry, qualification and certification of a welder or welding operator by code. Proper techniques are practiced.

LEARNING OUTCOMES

1. Identify and explain shielded metal arc welding (SMAW) safety.
2. Explain welding electrical current.
3. Identify welding power supplies ad their characteristics.
4. Explain how to set up welding power supplies.
5. Set up a machine for welding.
6. Identify tools for weld cleaning.

WLDG 148: ORNAMENTAL ART WELDING

This course includes a fun and creative way to learn basics of welding that allows a student to make ornamental welded projects from start to finish.

LEARNING OUTCOMES

1. Student will demonstrate and explain the proper use of propane, oxygen, and acetylene for forge work.
2. Identify and understand the proper use of different hammers and chisels.
3. Use proper protective equipment in forge work.
4. Understand the proper set up of equipment used in blacksmithing work.
5. Identify different types of metal and welding processes used in blacksmithing work.