



Waldo County Technical Center
Waldo, Maine
Welding Technology

Course Number:	WT1	Course Title:	Welding Technology
Credit Hours:	4	Clock Hours:	Mon-Fri 8:25-11:00, 11:45-2:05
Instructor:	Kevin McKenney	Room:	Welding Lab
Office Hours:	N/A	Voice Mail:	207-342-1334 Ext 103
E-mail Address:	KevinMcKenney@waldotech.org		

Text: NCCER Welding Level One Trainee Guide-AWS Entry-Level Welder Program
Print Reading for Welders -T. Proctor, J. Gosse
Welding Principles and Applications, Fifth Edition- Larry Jeffus

Mandatory PPE: **Steel-toe boots**, scholarships will be available to students that meet the guidelines;
Safety glasses, two pairs per year are provided;
Hearing protection, four sets of reusable ear plugs provided by the school, one set per quarter;
Welding hood and face shield, provided by the school;
Welding jacket provided.
Students are free to buy and wear any PPE they want to bring in to the shop.
Students are responsible for lost or stolen PPE provided by the school.

Course Description:

The Welding Technology program is a one or two-year course of study that emphasizes “hands-on” experience in arc welding.

First year students concentrate on shop safety, blueprint reading, weld joint design, shielded metal arc welding (SMAW), oxygen and acetylene welding and cutting, and the development of the manual skills necessary to weld in all positions.

The second year is available to those who have met the prerequisites and will focus on development of skills in: Gas Metal Arc Welding (GMAW), Flux cored arc welding (FCAW) Gas Tungsten Arc Welding (GTAW), and special fabrication projects. OSHA 10 Hour General Industry Safety and Ladder Safety is included in the program.

Course Objectives: On completion of the course, participants will be able to:

1. Describe the dangers of fumes, gases and radiation when welding
2. Understand the mechanical hazards and dangers of overexposure to noise
3. Correctly use appropriate PPE for welding
4. Use welding equipment safely, in compliance with Safe Operating Procedures (SOP)
5. Describe the various commonly-used welding joints
6. Set up an arc welding machine correctly
7. Weld pad of beads, T, Butt and Lap joints
8. Employ the appropriate welding process (MIG, TIG, or Stick, as appropriate to employer’s needs)
9. Weld to an acceptable standard in line with the major employer’s requirements
10. Recognize common welding faults
11. Understand how safety can be compromised by poor weld quality
12. Test completed welds
13. **Pass AWS Test#: D1-SM-F4-P-A-L flat position. First year student requirement.**
14. **Pass AWS Test#: D1-SM-F4-P-A-L all position . Second year students requirement.**

Course Activities:

This course will include:

1. Many hours of practice welding different joints in the welding booth.
2. Quizzes covering the concepts and information derived from current sections of course material
3. Assignments consisting of research or text book questions
4. Lab design projects involving teams or individuals using design criteria.
5. Building fabrications from blueprints.
6. Working on repair projects.

Unit Topical Outline

1. INTRODUCTION

- A. Definition / History
- B. The Welding Process
- C. Safety
- D. Quality
- E. Productivity
- F. Welding Vocabulary

2. THE WELD

- A. The Parts of a Weld
- B. The Types of Welds
- C. The Weld Joints
- D. The Weld Positions
- E. The Heat Affected Zone
- F. The Weld Symbol

3. PROCESS VARIABLES

- A. Fixed Variables
- B. Manipulated Variables
- C. Essential Variables
- D. Non-Essential Variables

4. WELD DEFECTS

- A. Discontinuity
- B. Visual inspection
- C. Mechanical Test
- D. Non-Destructive Examination

5. METAL

- A. Properties { Chem. - Phys. - Mech. }
- B. Ferrous
- C. Non-Ferrous
- D. Heat Treating
- E. Weldable Alloys

6. WELDING PRACTICE

- A. Oxy-Fuel Cutting
- B. Oxy-Fuel Brazing
- C. Oxyacetylene Welding
- D. Shielded Metal Arc Welding
- E. Gas Tungsten Arc Welding
- F. Gas Metal ArcWelding
- G. Flux Cored Arc Welding

Evaluation Basis:

- | | |
|---------------|-----|
| a. Shop work | 60% |
| b. Attendance | 20% |
| c. Class work | 20% |

Lab Grading and Policy:

- All lab projects will be done individually or with a maximum of two per team.
- Lab projects will be collected on due date and graded for accuracy and content based upon the following:

Participation Rubric Guidelines

	Great (2 pts)	average (1 1/2 pts)	Below Average(1 pts)	Poor (1/2 pts)	No marks (0pt)
Focus/ stay on task	Fully focused on the task. Full engaged in the process or project & able to involve or instruct others in the process	Mostly focused on the task with limited distractibility. Mostly engaged in the process or project. 1 verbal warning	Somewhat focused on the task, but occasionally distracted or side-tracked. Somewhat engaged in the process or project. 2 verbal warnings	Struggled to focus on the task, but easily distracted or side-tracked. Struggled to engage in the process or project. 3 verbal warnings	No show and or no participation, Cell phone violation.
Cooperation with Teacher and classmates	Fully contributed to the group climate in a positive manner & encouraged others to do the same. Accepted constructive criticism	Mostly contributed positively to the group climate. 1 reminder about attitude	Somewhat contributed positively in the group. Multiple reminders about attitude	Struggled to contribute positively in the group climate and interjected with negative comments, distracting side conversations, and/or non-constructive criticism of others	No show and or no participation, Cell phone violation.
Safety Awareness	Fully approached the project with safety awareness & encouraged others to do the same	Mostly approached the project with safety awareness; may have needed 1 reminder from the leader/group for a minor reason	Had a basic level of safety awareness, but needed a couple reminders from the leader/group	Struggled with safety awareness, needing numerous reminders from the leader/group	No show and or no participation, Cell phone violation.
Process/ Project	Produced a product (or completed a process) that fully meets the standards & stands out as exemplary for its class	Produced a product to complete (or completed a process) and it mostly met standards may have missed only top quality by 1 measure.	Produced a product to completion (or completed a process) but it didn't fully meet standard; may have missed 2 or more measures of quality	Did not produce the desired outcome (or failed to complete a process); task incomplete or completed entirely incorrectly	No show and or no participation, Cell phone violation.
Language	Appropriate language used with classmates and instructors. Polite and courteous, uses manners	Appropriate language used, but forgot manners	1 use of inappropriate language (swearing)	2 or more uses of inappropriate language	No show and or no participation, Cell phone violation.

*Two points per day max for each step completed for a total of 10 points per day

Clean Up Rubric Guidelines

Task	Did perform	Did not perform
Roll up welding leads	2.0 pts Full Marks	0.0 pts No Marks
Put hand tool and projects away	2.0 pts Full Marks	0.0 pts No Marks
Cleanup/ Scrape down booths, remove tack welds and excess spatter	2.0 pts Full Marks	0.0 pts No Marks
Sweep table top Sweep under table and alleyways	2.0 pts Full Marks	0.0 pts No Marks
Put old rod in scrap metal barrel and put new rod back in rod containers	2.0 pts Full Marks	0.0 pts No Marks

*Two points per day for each step completed for a total of 10 points per day

WCTC Grading Scale:

Letter	Scale
A+	98-100
A	95 – 97.9
A-	93 – 94.9
B+	90 – 92.9
B	87 – 89.9
B-	85 – 86.9
C+	82 – 84.9
C	79 – 81.9
C-	77 – 78.9
D+	75 – 76.9
D	72 – 74.9
D-	70 – 71.9
F	Below 70

Attendance Policy:

WCTC believes that regular and prompt attendance at each class session is extremely important. It is my belief that excessive absenteeism and/or lateness reflect negatively upon student reliability and impacts my ability to provide a quality reference to potential employers.

If the total number of legitimate absences is extensive, it may be impossible for the student to meet the objectives of the course. In such instances the instructor may assign a grade of Incomplete (I).

Lab Behavior:

Welding is a course that requires the attention of students without distractions from others. Students will not use personal electronic devices in the classroom or shop in any manner! Examples include cell phones, radios, computer entertainment, or media devices. Students will be asked to stop using these devices by the instructor; use of these devices is inappropriate and will result in a zero for the day in the participation rubric.

Academic Honesty:

WCTC students are expected to be honest and forthright in their academic endeavors. Cheating is an act of deception by which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered. Items submitted for evaluation must represent your own work.

It is expected that you will make use of any resources available to you as become proficient in the course objectives. However, it is academically dishonest to represent the work of others as your own. Any departure from academic honesty will be dealt with according to procedures outlined in the WCTC student handbook.