Welding Technician 1

Exam Information

Exam number
595

Items
53

Points
60

Prerequisites
None

Recommended course length
One year

National Career Cluster
Agriculture, Food & Natural Resources
Architecture & Construction
Manufacturing

Performance standards
Included (Optional)

Certificate available
Yes

Description

The Welding Technician 1 industry certification exam assesses basic welding skills. It evaluates learners on their ability to apply technical knowledge and skills in the workplace and in project construction. The exam measures the knowledge, attitude, skills, and habits required for performing tasks autonomously, including the selection and use of appropriate techniques and equipment with minimum supervision.

Exam Blueprint

Standard	Percentage of exam
1. Development Activities	2%
2. Work-Readiness Activities	2%
3. Welding Understanding	10%
4. Lab Safety	18%
5. Equipment Identification	12%
6. Blueprint Detail Identification	17%
7. SMAW Process Use	13%
8. GMAW Process Use	13%
9. Manual Oxy Fuel Process	13%

Standard 1

Student will participate in personal and leadership development activities through SkillsUSA or another appropriate career and technical student organization.

Objective 1 Students will use communication skills to effectively communicate with others.

1. Understand when it is appropriate to listen and to speak.
2. Understand and follow verbal and written instructions for classroom and laboratory activities.

Objective 2 Students will effectively use teamwork to respectfully work with others.

1. Identify and understand different roles in working with a team

Objective 3 Student will use critical thinking and problem-solving skills

1. Analyze the cause of the problem.
2. Develop a solution to address the problem.
3. Implement the plan.
4. Evaluate the effectiveness of the plan.

Objective 4 Students will be dependable, reliable, steady, trustworthy and consistent in performance and behavior.

1. Set and meet goals on attendance and punctuality.
2. Prioritize, plan and manage work to complete assignments and projects on time.

Objective 5 Students will be accountable for results.

1. Use an achievement chart for activities and behaviors in class that encourages a personal evaluation of classroom performance.
2. File a regular written report on progress toward completion of assignments and projects.

Objective 6 Be familiar with the legal requirements and expectations of the course.

1. Be familiar with the course disclosure statement and all requirements for successful completion of the course.
2. Demonstrate workplace ethics, e.g. fair, honest, disciplined.

Standard 2

Students will participate in work-place readiness activities.

Objective 1 Students will demonstrate employability skills.

1. Use a career search network to find career choices.
2. Write a resume including a list of demonstrated skills.
3. Write a letter of application.
4. Complete a job application.
5. Participate in an actual or simulated job interview.

Objective 2 Students will participate in a work-based learning experience outside the classroom.

1. Students will plan and implement a work-based learning experience aligned with their career goal.

Standard 3

Students will understand welding processes and procedures.

Objective 1 Identify weld joints, weld types and weld positions.

1. Identify five welding joints; butt, corner, edge, lap and tee.
2. Identify four types of welds; filet, groove, surfacing, and plug or slot.
3. Identify four welding positions; flat, vertical, horizontal and overhead.

Objective 2 Visually identify common weld defects.

Standard 4

Students will demonstrate appropriate welding safety practices for laboratory and work settings.

.**Objective 1** Implement safety practices related to welding.

1. Identify, select, and properly use appropriate personal protective equipment (PPE).
2. Verify that all equipment is in good operating condition and that appropriate safety devices are in place and working (e.g., guards in place, tool rests adjusted, etc.).
3. Maintain a neat, well-organized laboratory or shop working area.

Objective 2 Identify fire hazard conditions and actions to take in case of fire.

1. Explain combustion and identify three conditions necessary for it to occur.
2. Describe fire prevention in a welding shop or work site.
3. Explain classes of fires and appropriate extinguishers.

Objective 3 Take appropriate actions in an accident or emergency.

1. Demonstrate the use of simple first aid in an accident with an injury.
2. Locate first aid kits and investigate their contents and use in appropriate settings.
3. Discuss appropriate safety responses in an accident or emergency.

Standard 5

Students will identify welding tools and equipment.

Objective 1 Identify and properly use welding tools and equipment.

1. Identify and properly use basic welding hand tools (e.g., safety glasses, welding helmet, chipping hammer, gloves, etc.).
2. Identify and properly use basic power tools and equipment (e.g., shielded metal arc welder, gas metal arc welder, bench grinder, etc.).

Standard 6

Student will identify and use basic layout techniques, welding symbols and drawing symbols identified in blueprints.

Objective 1 Use basic math and measuring skills to enhance basic layout techniques.

1. Perform basic math conversions from fractions to decimals.
2. Read and correctly use a tape measure, ruler, and square.
3. Perform basic layout techniques.

Objective 2 Read and interpret welding blueprints.

1. Apply information found in the information block of the drawing.
2. Identify basic views used in blueprints, including assembly, detail, and fit-up drawings.
3. Identify common types of lines used in blueprints, including object, hidden, center, and construction lines.

Objective 3 Identify and apply basic welding symbols.

1. Identify and interpret basic welding symbols (e.g., square groove weld, fillet weld, field weld, reference line, etc.).
2. Draw welding symbols for given specifications.
3. Interpret a welding blueprint and welding procedure specifications.

Standard 7

Students will use the Shielded Metal Arc Welding (SMAW) process.

Objective 1 Set up for SMAW operations on carbon steel.

1. Properly set up a welding machine.
2. Start and restart an arc and run a bead on carbon steel.
3. Identify common electrode classifications.

Objective 2 Properly set up and complete fillet and groove welds in the flat and horizontal position with SMAW process.

1. Build a pad of overlapping beads in a flat position. Include the skills, striking an arc, restarts, and filling a crater.
2. Make 1F (flat position-fillet weld) welds on carbon steel.
3. Make 2F (horizontal position-fillet weld) welds on carbon steel.
4. Make 1G (flat position-groove weld) welds on carbon steel.

Standard 8

Students will use the Gas Metal Arc Welding (GMAW) process.

Objective 1 Set up for GMAW operations on carbon steel.

1. Properly set up a welding machine.

2. Start and restart an arc and run a bead on carbon steel.
3. Identify common electrode classifications.

Objective 2 Properly set up and complete fillet and groove welds in the flat and horizontal position with the GMAW process.

1. Use Short Circuit Transfer welding process to make 1G (flat position-groove weld) welds on carbon steel.
2. Use Short Circuit Transfer welding process to make 1F (flat position-fillet weld) welds on carbon steel.
3. Use Short Circuit Transfer welding process to make 2F (horizontal position-fillet weld) welds on carbon steel.
4. Use Short Circuit Transfer welding process to make 1F (flat position-fillet weld) multi-pass weld on carbon steel.

Standard 9

Students will use a manual oxy fuel process/system.

Objective 1 Set up and safely use a manual oxy fuel system to cut metal.

1. Perform safety inspections of equipment and accessories.
2. Set up for manual oxyfuel gas cutting operations on carbon steel.

Objective 2 Perform oxy fuel cutting operations on carbon steel.

1. Perform straight cutting operations on carbon steel.
2. Perform shape-cutting operations on carbon steel.
3. Perform bevel-cutting operations on carbon steel.
4. Pierce a hole through a carbon steel plate.

Welding Technician 1

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated standards and exam. To pass the performance standard the student must attain a performance standard average of 8 or higher on the rating scale. Students may be encouraged to repeat the objectives until they average 8 or higher.

Student's Name: _____

Class: _____

Performance standards rating scale

0	Limited skills	2	→	4	Moderate skills	6	→	8	High skills	10

Performance skills **Score:**

- File a regular written report on progress toward completion of assignments and projects.
- Students will plan and implement a work-based learning experience aligned with their career goal.
- Implement safety practices related to welding.
- Interpret a welding blueprint and welding procedure specifications.
- Use the SMAW process to make 1G (horizontal position-groove weld) welds on carbon steel.
- Use the GMAW Short Circuit Transfer welding process to make 1G (horizontal position-groove weld) welds on carbon steel.
- Perform oxyfuel cutting operations on carbon steel.

Performance standard average score:

Evaluator Name: _____

Evaluator Title: _____

Evaluator Signature: _____

Date: _____